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## Who Is Willing to Migrate in the CEECS? Evidence From the Czech Republic

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# Who is Willing to Migrate in the CEECs?

## Evidence from the Czech Republic

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### Abstract

This paper explores the willingness to migrate in the Czech Republic. We find that variables measuring regional labour market conditions and amenities contribute little to explaining the willingness to migrate, but that personal and household characteristics are more important. Persons owning family houses are substantially less willing to migrate and the relationship between the willingness to migrate and income is U shaped, persons experiencing longer unemployment spells are not less willing to migrate and commuting may at least partially compensate for low internal migration. Finally, with the exception of the less educated, the willingness to migrate of all groups analysed reacts only weakly to regional labour market conditions and amenities.

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## Introduction

Recent research into labour market adjustment mechanisms of the Central and East European Countries (CEECs) suggests that low internal migration is one of the major impediments to reducing regional disparities. Fidrmuc (2003) finds that internal mobility in these countries is low, has been falling over the last decade and is inefficient in reducing regional disparities. Ederveen and Bardsley (2003) find that migration in the CEECs is less responsive to regional wage and income disparities than in old EU member states, Huber (2004) estimates net migration should increase substantially, to be comparable to old EU member states, given regional unemployment and wage disparities and Drinkwater (2003a) reports that among the larger CEECs only Poland ranks in the upper half in a list of 20 countries' willingness to migrate. The collected evidence thus suggests that increasing the willingness to migrate should be a primary policy concern in the CEECs, since low migration rates question the short run adjustment capabilities of regional labour markets and are likely to contribute to high nation wide unemployment through regional mismatch in the long run. A number of explanations such as liquidity constraints, housing market imperfections and a high share of owner occupied housing as well as low search incentives for the (long term) unemployed have been put forward to explain low migration. Only few studies, however, have used individual level migration data to address the issues of who are the migrants in the CEECs and what motivates individuals to migrate.<sup>1</sup>

From a policy perspective these issues are, however, of some relevance, since targeting low migration in the CEECs would necessitate a clear understanding of what are the major impediments to migration and what could make those unwilling to migrate more willing. In this paper we use data from a large scale questionnaire conducted in the Czech Republic, which inter alia surveyed the willingness to migrate to address these issues: We present a model of the choice of answer to the question under consideration in the next section. This model shows that aside from individual factors, regional factors such as wage disparities influence the willingness to migrate. Section 3 discusses of the data, while in section 4 reports results of an econometric analysis of the willingness to migrate. We find that the willingness to migrate in general is little reactive to regional disparities and that those least willing to

migrate are family house owners, the less educated, middle income earners and the elder as well as persons residing in regions with an above average unemployment rate. Thus in section 5 we focus on the impediments to the willingness to migrate for these groups. We find that only the less educated are characterised by a higher responsiveness of the willingness to migrate to regional economic conditions than the overall workforce. Furthermore, the less educated and residents of high unemployment regions are least willing to migrate when their regions are remote from other potential receiving regions. In Section 6 we thus conclude by arguing that our evidence suggests that housing market inefficiencies, high shares of owner occupied housing as well as low migration incentives for middle income groups are the most important impediments to migration in the Czech Republic and that any policy which focuses on increasing the willingness to migrate among the least mobile groups is unlikely to yield rapid returns on account of the low reactivity to economic conditions of these groups.

## The Model

We use data from the 11th Survey on Economic Expectations and Attitudes conducted in the Czech Republic in April 1998. Among the over 100 questions posed, the one of interest to us is: "In case you would not have a job and you would have a possibility to get a job and a flat in another, distant municipality, would you be ready to move?". Respondents had to choose between four possible answers: definitely yes, rather yes, rather not and definitely not.

To model the choice of answer we consider an economy consisting of a number of regions sufficiently distant from each other to preclude commuting. In each region ( $i \in \{1 \dots I\}$ ) employed workers earn wages ( $w_i$ ) facing an exogenous probability of job loss of ( $s$ ), the unemployed by contrast search for jobs with constant search intensity and receive a fixed unemployment benefit ( $b$ ). The probability for an unemployed to be matched to a job ( $p_i$ ) is determined by a matching function, which depends on the unemployment ( $u_i$ ) and vacancy rate ( $v_i$ ) in the region of residence  $i$  such that:

$$(1) \quad p_i = f(u_i, v_i)$$

where  $f()$  is increasing in both  $u_i$  and  $v_i$ . Given linear homogeneity of  $f()$ ,  $p_i$  depends only on the unemployment vacancy ratio ( $\theta_i = u_i / v_i$ ) such that  $p_i = \varphi(\theta_i)$  with  $p_i$  decreasing in  $\theta_i$ .

Individuals derive utility from income (which is either  $b$  or  $w_i$ ) and amenities ( $a_i$ ), which are a function of a vector of regional characteristics ( $z_i$ ) (i.e.  $a_i=a(z_i)$ ). We denote by  $V_i$  the presented discounted value of being employed in region  $i$  and  $U_i$  the present discounted value of being unemployed. As shown by Pissarides (1990) in steady state  $V_i$  and  $U_i$  satisfy:

$$(2) \quad rV_i = w_i + a_i + s[U_i - V_i]$$

$$(3) \quad rU_i = b + a_i + \varphi(\theta_i)[V_i - U_i]$$

with  $r$  the nation wide interest rate. Solving (2) and (3) for  $V_i$  and  $U_i$  yields:

$$(4) \quad V_i = a_i + \frac{w_i(r + \varphi(\theta_i)) + sb}{r(r + s + \varphi(\theta_i))}$$

and

$$(5) \quad U_i = a_i + \frac{b(r + s) + \varphi(\theta_i)w_i}{r(r + s + \varphi(\theta_i))}$$

If an individual ( $k$ ) moves from region  $i$  to  $j$  we assume that it has to pay migration costs  $t_{ij}$ , which are determined by individual characteristics ( $c^k$ ) and distance between the sending and receiving region ( $d_{ij}$ ). A risk neutral individual ( $k$ ) unemployed in region  $i$  which has an offer for a job and a flat in region  $j$ , as implied in the question, will thus prefer moving to staying in the region (i.e. will be willing to migrate) if :

$$(6) \quad V_j - U_i > t_{ij}(c^k, d_{ij})$$

or

$$(7) \quad y^* = a_j - a_i + \left[ \frac{w_j(r + \varphi(\theta_j)) + sb}{r(r + s + \varphi(\theta_j))} - \frac{b(r + s) + w_i\varphi(\theta_i)}{r(r + s + \varphi(\theta_i))} \right] - t_{ij}(d_{ij}, c^k) > 0$$

Thus aside from migration costs, which depend on the personal characteristics and distances between regions, the willingness to migrate will be influenced by regional characteristics such as the wage level, unemployment-vacancy ratios as well as amenities in both receiving and sending regions.

To empirically implement the model we approximate (7) by a first order Taylor expansion around the mean, which yields:

$$(8) \quad y^* \approx \bar{y}^* + \frac{\partial a(\bar{x})}{\partial z} (\tilde{a}_j - \tilde{a}_i) + \frac{(r + \varphi(\bar{\theta}_i))}{r(r+s+\varphi(\bar{\theta}_i))} \tilde{w}_j - \frac{\varphi(\bar{\theta})}{r(r+s+\varphi(\bar{\theta}))} \tilde{w}_i + \frac{\partial \varphi(\bar{\theta})}{\partial \theta} (\bar{w} - b) s \tilde{\theta}_j - \frac{\partial \varphi(\bar{\theta})}{\partial \theta} (\bar{w} - b) (s+r) \tilde{\theta}_i - \frac{\partial t(\bar{d}, \bar{c}^k)}{\partial d} \tilde{d}_{ij} + \frac{\partial t(\bar{d}, \bar{c}^k)}{\partial d} \tilde{c}^k$$

or after collecting parameter terms and adding an individual specific error term  $\eta^k$ .

$$(8') \quad y^* \approx \alpha + \beta_a (\tilde{a}_j - \tilde{a}_i) + \beta_w \tilde{w}_j - \beta_w \tilde{w}_i + \beta_{\theta_j} \tilde{\theta}_j - \beta_{\theta_i} \tilde{\theta}_i + \beta_d \tilde{d}_{ij} + \beta_c \tilde{c}_i^k + \eta^k$$

where any variable  $\tilde{x}$  is the deviation of  $x$  to its mean  $\bar{x}$ , (i.e.  $\tilde{x} = x - \bar{x}$ ) and  $\beta_x$  is the partial derivative of  $y^*$  with respect to  $x$  evaluated at  $\bar{x}$  with  $x \in \{a_i, a_j, w_i, w_j, \theta_i, \theta_j, d_{ij}, c_j^k\}$ .

The possible answers to the question were definitely no, rather no, rather yes and definitely yes. We thus cannot observe  $y^*$  but only one of the four possible answers which are encoded 1 through 4 respectively. In consequence we assume that all individuals for who (7) was fulfilled answered either by selecting the answer definitely yes (i.e. 4) or rather yes (i.e. 3), and that all other people answered rather not or definitely not (i.e. 2 or 1). Furthermore, we assume that the two extreme answers occurred if either  $y^*$  was very high (for definitely yes) or low (for definitely not). Denoting as  $\mu_1$ ,  $\mu_2$  and  $\mu_3$  the cut off levels between choosing categories 4, 3, 2 and 1 respectively, we can write the behavioural model underlying the choice of answer ( $y$ ) by:

$$(9) \quad y = \begin{cases} 4 & \text{if } y^* \geq \mu_3 \\ 3 & \text{if } \mu_3 > y^* \geq \mu_2 \\ 2 & \text{if } \mu_2 > y^* \geq \mu_1 \\ 1 & \text{if } \mu_1 > y^* \end{cases}$$

Thus equations (8') and (9) under the assumption that  $\eta^k$  as follows a logistic distribution define a standard ordered logit model of the choice of answer to the question analysed.<sup>2</sup>

## Data

In our questionnaire a representative sample of 1075 individuals was interviewed on their households' financial and socio-economic position, employment experiences, their expectations of economic development for the next two years and their attitudes and opinions concerning reforms as well as current political debates. We merge this data with regional indicators from statistical yearbooks coded

at NUTS 4 level (called Okresy in Czech). These regions in average cover approximately 1000 square kilometres and have around 130.000 inhabitants.

{Table 1 around here}

We focus exclusively on the economically active (unemployed and employed) and exclude all questionable observations, which leaves us with 796 observations.<sup>3</sup> Table 1 presents the answers to the question on the willingness to migrate. Only 18.3% of the 796 interviewed economically active answered they would definitely move if unemployed and offered work and residence in a distant region. A further 25.3% indicated they would probably move; almost 24.9% stated they would definitely not move and a further 31.7% would rather not move. The groups with the lowest willingness to migrate are the less educated, old persons, family house owners are and middle income groups. Also, persons residing in regions with above average unemployment rates (high unemployment regions) are less willing to migrate than persons residing in low unemployment regions.

In our econometric estimates we use both individual and region specific variables as explanatory variables. For the individual characteristics we follow the literature on the willingness to migrate in other countries and use gender, age, household structure (number of economically active and number of children in the household), highest completed education (elementary or less, vocational, secondary, university) and marital status (a dummy for married persons). The literature on the willingness to migrate (see: Ahn et al 1999, Yang, 2000 and Drinkwater, 2003) generally finds that females, married and old and less educated persons are less willing to migrate. We also include variables to measure current personal and household income and wealth (measured by a set of dichotomous variables to eschew problems of non-linearity) as well as an indicator concerning the type of residence of the household (family house as the base category, co-operative flat, rented flat, owner occupied flat and other), because a number of authors have suggested that home owners may be less willing to migrate

(e.g. Hughes and Mc McCormick, 1987) and that persons with low income may be liquidity constrained<sup>4</sup>. Furthermore, we include variables on the duration of unemployment in the last two years, because Jackman and Savouri (1992) as well as Gross and Schoening (1984) provide evidence that long term unemployed are less likely to migrate and control for labour market status (unemployed and employed) and entrepreneurial activity<sup>5</sup> of the individual. Finally, we include some less conventional variables such as the preferences for a certain economic system (socialism, social market economy, market economy) to capture differences in attitudes to flexibility, and a subjective measure of poverty by considering a question in which respondents were asked, whether they consider themselves poor or not.<sup>6</sup>

Among the regional variables, aside from both sending and receiving regions' unemployment-vacancy ratios and receiving region wages<sup>7</sup>, we also include measures of criminality (crimes per 1000 inhabitants), environmental quality (tons of emissions of hazardous wastes per square kilometre<sup>8</sup>), variables measuring availability of public infrastructure (schools per 1000 inhabitants, hospital beds per 10000 inhabitants)<sup>9</sup> and a dummy variable which takes on the value one if the individual resides in a large city with more than 1 million inhabitants. Furthermore, as a measure of the distance of the region of residence from the average receiving region we take the average distance between the capital city of the region of residence to all other regions' capital cities.<sup>10</sup>

Finally, one of the assumptions in our model is that sending and receiving regions are far enough apart to preclude commuting. This is unlikely to be realistic given the size of our regions, and Burda and Profit (1996) provide evidence of commuting in the Czech Republic. We thus also include regional labour market conditions and amenities in the average neighbouring region to account for potential impacts of commuting possibilities of the willingness to migrate.<sup>11</sup>

Descriptive statistics for these variables (mean and standard deviations) are displayed in the first two columns of table 2). In general the sample fits aggregate statistics rather well. In our sample 47% of the interviewed economically active are female. This accords well with official statistics. There is, however, an under-representation of unemployed at the expense the employed. According to official



statistics registered unemployment in the Czech Republic was at around 7.5% in 1998 but in our questionnaire only over 4.3% were unemployed. This may be explained by the usual differences between interview based measures of unemployment and registered unemployment. Also in our data almost 3% of the economically active had unemployment spells exceeding the length of one year during the last two years, which accords with studies on labour market flows in the Czech Republic (see: Storm and Terrell, 1997), which find low escape probabilities from unemployment and high long term unemployment rates. Finally, almost 40% of the interviewed in our sample live in a family house and another 8.5% own their flat. This suggests that the share of owner occupied housing in the Czech Republic approaches EU levels. According to Eurostat the unweighted average share of owner occupied housing in the EU is at around 60% and lies below 50% in countries such as the Netherlands, Germany or Sweden.

{Table 2 around here}

## Overall Results

Table 2 also shows ordered logit results for the variables analysed.<sup>12</sup> In the column headed full sample we focus on all observation, while the following columns report results for men and women. Among the variables included age,<sup>13</sup> income and house ownership are the most important determinants of the willingness to migrate. Older people are significantly less willing to migrate while personal income has a U - shaped impact. Initially a higher income reduces the willingness to migrate but at a monthly income of around 5700,-- KCS, increasing income raises the willingness to migrate. Household income provides no further explanation of the willingness to migrate and the dummy variables measuring wealth remain insignificant throughout. Furthermore, the significant impact of income on the willingness to migrate results only from males.

Housing variables, by contrast, are an important determinant of the willingness to migrate for both genders. Owners of family houses have a significantly lower willingness to migrate than persons

living in other residences. This could be explained either by housing market inefficiencies, which preclude the rapid sale of family houses without financial loss.<sup>14</sup> For females other forms of residence (owner occupied apartments, rented houses or apartments, cooperative housing and others) do, however, not differ significantly from each other, while for males owning a flat is statistically equal to owning a house.

Females who have completed more than elementary education are significantly more willing to migrate. The effect of education on the willingness to migrate seems to be non-linear, however, an applies only to women. Females with completed university education are not significantly more willing to migrate than those with vocational or compulsory training. This suggests that a large part of the higher willingness to migrate of high education groups exhibited in the raw data (see Table 1) is captured by the higher income earned by these groups in our regressions.

The time spent in unemployment in the last two years, only has a marginally significant impact on the willingness to move. Persons, who were unemployed for more than a year in the two year period preceding the interview, have a willingness to migrate, which hardly differs from that of persons, who were never unemployed and for persons with 2 to 12 month unemployment experience, the negative impact on the willingness to migrate is significant for women only. This accords with the results of Ahn et al (1999), who also find that the discouragement effects of long term unemployment on search activities are not of particularly high relevance in explaining low willingness to migrate. Equally the number of children in a household is an insignificant deterrent to the willingness to migrate while the number of economically active increases the willingness to migrate in particular for men.

Among the measures of regional characteristics only the unemployment-vacancy ratio in neighbouring regions turns out to have a significant impact and some variables (number of schools in the region, the unemployment-vacancy ratio in the average receiving region as well as the wages and crime rate in neighbouring regions) have an unexpected sign, which, however, remains insignificant. This suggests that the overall impact of regional variables on the willingness to migrate is small in the Czech

Republic and the significance of the neighbouring regions unemployment vacancy ratio may be indication of the relevance of commuting as an alternative to migration.

Finally, our less conventional variables concerning the preferred economic system and the subjective measure of poverty have a significant impact on the willingness to migrate. The more in favour of a market economy a person is the higher is its willingness to migrate – in particular for men - and males, who consider themselves members of a poor household are substantially more willing to migrate than males who do not.

In summary or results indicate that the responsiveness of the willingness to migrate to regional characteristics is low and that personal characteristics such as income and housing are more important in determining the willingness to migrate. This in turn suggests that a combination of housing market imperfections and liquidity constraints for prospective movers are important in determining the low willingness to migrate, By contrast, we find little evidence of discouragement effects for long term unemployed and some evidence that commuting may be a substitute to migration.

{Table 3: Around here}

This is also confirmed when considering marginal effects for the full sample reported in table 3. For continuously measured variables these marginal effects have the interpretation of the percentage change in the probability of an otherwise average person to answer in one of the respective categories, given a unit (one percent in the case of logarithmic variables) increase in the dependent variable. For dummy variables marginal effects measure the percent impact on the probability of answering in a particular category given a change of the dummy variable from zero to one for an individual with otherwise average characteristics. The coefficient on age for instance suggests that increasing the age of a person by one percent increases the chance of answering that it would definitely not be willing to move by 13.5%, while reducing the probability of being definitely willing to move by 10.3%. Increasing the number of active in a household by one person, by contrast, reduces the chances of

answering definitely no by 5.6% and increases chances of answering definitely yes by 4.3%. Furthermore, owners of family houses are by between 11.4% to 15.2% more likely to answer that they would definitely not move than owners of other housing categories, while their likelihood to answer they would rather not move is between 7.2% to 15.2% higher. Thus marginal effects suggest a rather substantial impact of housing variables on the willingness to migrate.

Similarly, people who are in favour of a market system are also more likely to answer that they either would rather or definitely be willing to migrate, while regional variables aside from the unemployment vacancy ratio in the neighbouring region, have no significant impact on the willingness to migrate. A 1% higher unemployment-vacancy ratio in neighbouring regions reduces the chances of being definitely unwilling to move by 8.8%, while increasing the chances of being definitely willing to move by 6.7%.

### **Differences among Subgroups**

Thus among the work force, family house owners, lowly qualified (persons who completed only vocational education or less), the elder (persons older than 39 years), and persons earning with a intermediate income belong to the least willing to migrate. In addition persons living in regions with above average unemployment rates (i.e. with registered unemployment rates above the national average) are not more willing to migrate than the regional average.

These groups are therefore particularly important in driving the low willingness to migrate in the Czech Republic. We were interested to what degree these groups differ from the overall workforce in the determinants of the willingness to migrate. Table 4 reports estimates of the model in equations (8') and (9) for these groups. As can be seen, there is some heterogeneity in the determinants of the willingness to migrate. In particular, the less educated as well as family house owners with longer unemployment duration in the last two years have a significantly lower willingness to migrate, indicating that for these groups discouragement effects play an important role. Furthermore, the less educated are slightly more responsive to regional labour market conditions and amenities. For the less educated – in contrast to the overall sample - higher unemployment vacancy ratios in the sending

region as well as a lower supply of schools significantly increase the willingness to migrate. Also for the less educated as well as persons residing in high unemployment regions the willingness to migrate is significantly negatively influenced by the regions' average distance to potential receiving regions. Thus remoteness from relevant labour market areas is an additional important deterrent to migration.

{Table 4 Around Here}

The major result of these regressions is, however, that for the majority groups analysed willingness to migrate is not reactive to regional variables. This applies not only to medium income earners and the elderly, for which even a number of personal characteristics, which are significant for the willingness to migrate for the overall workforce, remain insignificant, but carries over to all other groups except for the less educated.

## **Conclusion**

In this paper we use data from a large scale questionnaire conducted in the Czech Republic to identify the personal and regional factors which impede on the willingness to migrate. We show that for the work force as a whole the willingness to migrate is low, that regional labour market conditions and amenities contribute little to explain the willingness to migrate, but that personal and household characteristics such as income and residence in a family house are more important. In particular our evidence suggests that persons that own a family house are substantially less willing to migrate and that the relationship between the willingness to migrate and income is U-shaped. This implies that housing market imperfections, high shares of owner occupied housing and low migration incentives for the medium income groups are an important component in explaining low migration. We also find that, in average, persons experiencing longer unemployment spells are not less willing to migrate; thus discouragement effects are unlikely to play a major role in reducing migration, and we present evidence that commuting may at least partially compensate for low internal migration.

Finally, with the exception of the less educated, the willingness to migrate within all groups analysed in this paper does not react to regional labour market conditions and amenities. This implies that large groups of the population are unwilling to migrate irrespective of labour market conditions and reconfirms doubts on the viability of migration as a regional labour market adjustment mechanism in the Czech Republic. Some of our evidence also indicates that residents of high unemployment regions and the less educated are particularly unwilling to migrate, when their regions are remote from other potential receiving regions, which draws particular attention to the problems which may arise in peripheral high unemployment regions in the future. Our results thus suggest that improving the workings of the housing market, increasing migration incentives for the medium income groups and focusing on the problems of peripheral regions should be the primary foci of a policy to increase the willingness to migrate in the Czech Republic. Policies which focus on increasing the willingness to migrate among the least mobile groups in the population, however, are unlikely to yield fast returns on account of the low reactivity to economic conditions of these groups.

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*Table 1: Distribution of Responses by selected personal and regional characteristics*

	No	Rather Not	Rather Yes	Yes	Total
Overall	24.87	31.66	25.13	18.34	796
Male	23.64	31.68	25.30	19.39	423
Female	26.27	31.64	24.93	17.16	373
Married	18.18	26.79	33.97	21.05	209
Single	27.26	33.39	21.98	17.38	587
Elementary	26.26	35.35	23.23	15.15	99
Vocational	25.39	32.51	26.93	15.17	323
Secondary	22.76	29.85	24.63	22.76	268
University	27.36	30.19	22.64	19.81	106
less than 9000 KCS	18.63	27.45	31.37	22.55	102
9000 to 13800	24.86	30.81	26.49	17.84	185
13800 to 19000	28.00	36.00	21.20	14.80	250
more than 19000	24.32	29.73	25.48	20.46	259
family house	34.84	32.90	17.74	14.52	310
co-operative flat	19.70	34.85	28.79	16.67	132
rented flat	17.87	28.90	32.32	20.91	263
own flat	20.59	33.82	19.12	26.47	68
Other	13.04	21.74	39.13	26.09	23
age > 39	27.32	34.39	22.68	15.61	410
age < 40	22.28	28.76	27.72	21.24	386
low unemployment regions <sup>a)</sup>	25.77	30.26	24.82	19.15	423
high unemployment regions <sup>b)</sup>	23.86	33.24	25.47	17.43	373

Notes: Table reports share of responses in % of all economically active in the respective subgroups in the sample. a) low unemployment region = regions with registered unemployment rates below the national average b) high unemployment regions= regions with unemployment rates above the national average



Table 2: Logit - Regression Results (dependent variable willingness to migrate)

	Descriptives		Full Sample		Female		Male		
	Mean	SD	$\beta$	SE	$\beta$	SE	$\beta$	SE	
ln(age)	3.634	0.280	-0.782***	0.284	-0.859***	0.381	-0.978**	0.449	
ln(personal income)	9.082	0.507	-10.195***	3.680	-7.027	9.007	-14.360**	5.629	
ln(personal income) squared			0.589***	0.203	0.392	0.491	0.843***	0.314	
ln(household income)	3.634	0.280	-0.352	0.233	-0.221	0.324	-0.417	0.332	
Female	0.469	0.499	-0.150	0.129					
Unemployed	0.043	0.202	0.717	0.494	0.620	0.714	0.980	0.781	
Married	0.737	0.440	-0.188	0.207	-0.112	0.271	-0.376	0.317	
No. Of kids in Household	0.977	0.925	-0.112	0.086	-0.044	0.142	-0.188	0.130	
No. Of active in Household	1.861	0.705	0.325***	0.118	0.279	0.177	0.346*	0.194	
Education - Elementary <sup>a)</sup>	0.124	0.330							
- Vocational	0.406	0.491	0.321	0.247	0.263	0.306	0.388	0.398	
- Secondary	0.337	0.473	0.523*	0.283	0.801**	0.367	0.236	0.444	
- University	0.133	0.340	0.265	0.299	0.556	0.449	-0.241	0.446	
Wealth - assets 1	0.104	0.306							
- _Iassets_2	0.157	0.364	0.175	0.266	0.214	0.367	0.203	0.358	
- _Iassets_3	0.139	0.347	-0.103	0.246	0.035	0.347	-0.206	0.380	
- _Iassets_4	0.210	0.407	0.100	0.236	0.041	0.390	0.265	0.308	
- _Iassets_5	0.314	0.464	-0.098	0.279	-0.130	0.436	0.061	0.372	
- _Iassets_6	0.075	0.264	-0.425	0.456	-0.474	0.666	-0.181	0.648	
Unemployment Experienci in last 2 years	< 2	0.898	0.302						
	2 - 12	0.073	0.260	-0.518*	0.268	-0.864**	0.475	-0.487	0.380
	> 12	0.029	0.168	-0.864	0.595	-1.567	1.023	-0.433	0.731
Type of Residence	Family house <sup>a)</sup>	0.389	0.488						
	Co-operative Flat	0.166	0.372	0.770***	0.196	0.837***	0.281	0.688**	0.315
	Rented Flat	0.330	0.471	0.840***	0.190	0.895***	0.251	0.768**	0.307
	Own Flat	0.085	0.280	0.815***	0.251	0.834**	0.377	0.716	0.590
	Other	0.029	0.168	1.283***	0.405	0.332	0.627	1.622***	0.518
Poor Family	definatley yes	0.082	0.274						
	rather yes	0.266	0.442	-0.739***	0.287	-0.586	0.557	-0.860**	0.422
	rather not	0.455	0.498	-0.849***	0.300	-0.667	0.579	-0.978**	0.421
	definatley not	0.197	0.398	-0.870***	0.321	-0.781	0.593	-0.868**	0.441
Preferred System	Socialism	0.059	0.236						
	Social Market Economy	0.627	0.484	0.856**	0.383	0.932	0.604	0.955	0.644
	Market Economy	0.314	0.464	1.123**	0.437	0.919	0.646	1.600**	0.658
Income from private enterprise	Yes: Primary	0.031	0.174	0.853**	0.384				
	Yes Secondary	0.168	0.374	0.603	0.376	0.443	0.505	1.335	0.711
	No	0.800	0.400			0.244	0.482	1.008	0.705
Large City		0.237	0.426	-0.487	0.326	-0.382	0.484	-0.365	0.416
ln(unemployment vacany rate)		1.892	0.832	0.375	0.312	0.578	0.392	0.304	0.543
ln(crime rate)		-0.112	0.534	0.475	0.422	0.007	0.568	0.968	0.647
Ln(emissions)		-1.223	1.830	-0.026	0.042	-0.014	0.073	-0.054	0.067
Ln(schools)		1.261	0.530	-0.296*	0.172	-0.601**	0.291	-0.154	0.248
ln(unemplment vacany rate others)		1.920	0.012	35.505*	18.216	46.799**	23.413	34.329	31.157
ln (wage others)		9.274	0.002	-53.959	70.466	-95.398	99.826	9.169	92.404
ln(average distance)		5.301	0.206	-0.896*	0.481	-1.211	0.788	-0.441	0.602
ln(unemplment vacany rate neighbours)		1.818	0.661	0.509**	0.235	0.726**	0.355	0.323	0.315
Ln(wage neighbours)		9.286	0.045	2.015	2.947	5.499	4.920	-0.018	3.865
ln(crime rate)		-0.159	0.353	-0.464	0.437	-0.391	0.568	-0.617	0.714
Ln(emissions neighbours)		-1.037	1.362	0.047	0.081	-0.009	0.122	0.088	0.107
Ln(schools neighbours)		1.140	0.747	0.024	0.153	-0.027	0.215	0.118	0.205
Number of Observations		796		796		373		523	
Log Likelyhood				-1021.31		-540.78		-463.73	
H0: proportional odds (P-value)				0.06		0.03		0.03	
H0: Merge Categories									
1 and 2				0.03		0.99		0.89	
2 and 3				0.89		0.87		???	
3 and 4				0.04		???		???	

Note: Values in brackets are standard errors corrected for the effects of clustering of regional variables <sup>a)</sup> Reference Category, \* (\*\*) (\*\*\*) signifies significance at the 10% (5%) 1% level respectively

Table 3: Marginal Effects of Equation (3)

		1.00		2.00		3		4	
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
ln(personal income)		0.135***	0.050	0.056**	0.025	-0.088**	0.034	-0.103***	0.038
ln(personal income) squared		1.756***	0.626	0.734**	0.325	-1.145***	0.425	-1.346***	0.517
ln(household income)		-0.101***	0.034	-0.042**	0.018	0.066***	0.024	0.078**	0.029
Female		0.061	0.040	0.025	0.019	-0.040	0.026	-0.046	0.032
Unemployed		0.026	0.022	0.011	0.010	-0.017	0.015	-0.020	0.017
Married		-0.101*	0.055	-0.076	0.065	0.061*	0.026	0.117	0.096
No. Of kids in Household		0.032	0.034	0.015	0.017	-0.021	0.022	-0.026	0.029
No. Of active in Household		0.019	0.015	0.008	0.007	-0.013	0.010	-0.015	0.011
Education - Elementary <sup>a)</sup>		-0.056***	0.021	-0.023**	0.011	0.036***	0.014	0.043***	0.016
- Vocational		-0.054	0.042	-0.024	0.020	0.035	0.026	0.043	0.035
- Secondary		-0.086*	0.044	-0.043	0.027	0.055*	0.027	0.073	0.043
- University		-0.043	0.047	-0.022	0.028	0.028	0.029	0.037	0.045
Wealth									
- assets 1									
- _lassets_2		-0.029	0.043	-0.014	0.023	0.019	0.028	0.024	0.038
- _lassets_3		0.018	0.044	0.007	0.015	-0.012	0.029	-0.013	0.031
- _lassets_4		-0.017	0.039	-0.008	0.019	0.011	0.026	0.013	0.032
- _lassets_5		0.017	0.049	0.007	0.019	-0.011	0.032	-0.013	0.036
- _lassets_6		0.080	0.094	0.020*	0.011	-0.050	0.056	-0.049	0.046
Unemployment Experience last 2 years									
< 2									
2 - 12		0.100*	0.056	0.021**	0.009	-0.062**	0.033	-0.059**	0.027
> 12		0.180	0.140	0.009	0.034	-0.103	0.067	-0.086**	0.044
Type of Residence									
Family house <sup>a)</sup>									
Co-operative Flat		-0.114***	0.026	-0.076***	0.025	0.070***	0.017	0.120***	0.036
Rented Flat		-0.133***	0.027	-0.072***	0.024	0.083***	0.018	0.122***	0.033
Own Flat		-0.115***	0.030	-0.086***	0.033	0.067***	0.016	0.133***	0.051
Other		-0.152***	0.031	-0.152***	0.055	0.064**	0.026	0.240**	0.098
Poor Family									
definitely yes									
rather yes		0.139**	0.059	0.034**	0.014	-0.086**	0.034	-0.087***	0.032
rather not		0.149***	0.055	0.054***	0.020	-0.093***	0.031	-0.110***	0.041
definitely not		0.170**	0.070	0.028**	0.015	-0.102***	0.038	-0.096***	0.031
Preferred System									
Socialism									
Social Market Economy		-0.156**	0.072	-0.047**	0.020	0.097**	0.043	0.106**	0.045
Market Economy		-0.172***	0.058	-0.101**	0.048	0.102***	0.031	0.171**	0.077
Income from private enterprise									
Yes: Primary		-0.124***	0.047	-0.086*	0.048	0.075***	0.024	0.135*	0.073
Yes Secondary		-0.114	0.077	-0.027**	0.012	0.071	0.045	0.070*	0.040
No									
Large City		0.090	0.064	0.026**	0.013	-0.057	0.039	-0.059	0.036
ln(unemployment vacancy rate)		-0.065	0.053	-0.027	0.024	0.042	0.035	0.050	0.042
ln(crime rate)		-0.082	0.073	-0.034	0.032	0.053	0.047	0.063	0.056
Ln(emissions)		0.004	0.007	0.002	0.003	-0.003	0.005	-0.003	0.006
Ln(schools)		0.051	0.030	0.021	0.013	-0.033*	0.020	-0.039	0.023
ln(unemployment vacancy rate others)		-6.115	3.136	-2.557	1.482	3.987*	2.088	4.686*	2.454
ln (wage others)		9.294	12.22	3.886	4.840	-6.059	7.982	-7.122	9.356
				3					
ln(average distance)		0.154*	0.084	0.065*	0.037	-0.101*	0.056	-0.118*	0.064
ln(unemployment vacancy rate neighbours)		-0.088**	0.041	-0.037**	0.018	0.057**	0.028	0.067**	0.032
Ln(wage neighbours)		-0.347	0.505	-0.145	0.219	0.226	0.333	0.266	0.390
ln(crime rate)		0.080	0.076	0.033	0.032	-0.052	0.049	-0.061	0.058
Ln(emissions neighbours)		-0.008	0.014	-0.003	0.006	0.005	0.009	0.006	0.011
Ln(schools neighbours)		-0.004	0.026	-0.002	0.011	0.003	0.017	0.003	0.020

Note: Values in brackets are standard errors corrected for the effects of clustering of regional variables <sup>a)</sup> Reference Category, \* (\*\*) (\*\*\*) signifies significance at the 10% (5%) 1% level respectively

Table 4: Estimates for Subgroups

	Low Education group <sup>a)</sup>	Residence in high unemployment regions <sup>b)</sup>	Middle Income Group <sup>c)</sup>	Family House owners	Older than 39
ln(age)	-1.403*** (0.371)	-0.688* 0.399	-0.661*** 0.313	-0.674* 0.395	-1.002 1.235
ln(personal income)	-14.037*** 4.366	-1.137 8.931	-7.612 5.871	-16.600*** 4.492	11.579** 4.889
ln(personal income) squared	0.814*** 0.242	0.086 0.498	0.448 0.320	0.912*** 0.237	0.687*** 0.262
ln(household income)	-0.393 0.344	-0.004 0.357	0.209 0.389	0.220 0.507	-0.530 0.426
Female	0.158 0.185	-0.169 0.221	-0.140 0.175	-0.269 0.302	-0.044 0.218
Unemployed	0.898 0.578	0.771 0.615	0.582 0.779	0.967 0.873	1.550* 0.872
Married	0.044 0.261	-0.413 0.327	-0.283 0.286	-0.215 0.361	-0.149 0.312
No. Of kids in Household	-0.186* 0.109	-0.106 0.127	-0.091 0.104	-0.148 0.136	0.077 0.141
No. Of active in Household	0.236 0.158	0.058 0.180	0.166 0.150	0.071 0.244	0.556*** 0.170
Education - Vocational	0.431	0.407	0.312	0.641*	0.641*
- Secondary	0.278	0.343	0.423	0.382	0.332
- University		0.333	0.466	1.346***	1.025***
Wealth		0.383	0.412	0.503	0.390
- _Iassets_2	0.341	0.206	0.337	0.728	0.354
- _Iassets_3	0.356	0.492	0.432	0.488	0.379
- _Iassets_4	-0.270	0.021	-0.306	-0.828	0.281
- _Iassets_5	0.361	0.333	0.369	0.645	0.459
- _Iassets_6	0.058	0.354	-0.058	-0.422	0.527
Unemployment Experienci in last 2 years	0.328	0.299	0.356	0.521	0.470
2 - 12	-0.326	0.082	-0.362	-0.852	0.434
> 12	0.389	0.490	0.400	0.531	0.474
Type of Residence	-0.659	-0.680	-0.747	-1.113	0.710
Co-operative Flat	0.735	0.615	0.611	0.833	0.696
Rented Flat	-0.740**	-0.658*	-0.510	-1.558***	-0.517
Own Flat	0.351	0.379	0.411	0.671	0.466
Other	-1.443**	-0.946	0.732	-2.693***	-0.625
Poor Family	0.716	0.857	1.513	1.192	0.733
rather yes	1.076***	1.288***	0.641**		0.591*
rather not	0.248	0.276	0.257		0.302
Definatley not	1.207***	1.160***	0.711***		1.073***
Preferred System	0.278	0.282	0.230		0.311
Social Market Economy	1.140***	0.721	0.448		1.022***
Market Economy	0.363	0.458	0.306		0.363
Income from private enterprise	0.904	1.323**	0.418		1.810***
Yes Secondary	0.655	0.645	0.629		0.486
No	-0.779*	-1.221**	-1.108***	-0.494	1.366***
Large City	0.402	0.514	0.422	0.590	0.480
ln(unemployment vacany rate)	-0.931*	-1.308**	-1.473***	-0.662	1.516***
ln(crime rate)	0.464	0.531	0.415	0.620	0.474
Ln(emissions)	-1.121**	-1.422**	-1.368***	-0.760	1.498***
Ln(schools)	0.482	0.622	0.448	0.696	0.526
ln(unemployment vacany rate others)	1.175**	1.249**	0.752*	0.932	1.216***
ln(wage others)	0.469	0.489	0.411	0.491	0.510
ln(average distance)	1.427**	1.603**	1.154**	1.112	1.500***
	0.586	0.545	0.454	0.537	0.565
	1.011*	0.216	0.826*	0.997	0.949
	0.558	0.641	0.425	0.609	0.586
	0.821*	-0.217	0.471	0.567	1.030**
	0.487	0.736	0.421	0.590	0.516
	-0.753**	-0.440	-0.505	-0.734	-0.446
	0.335	0.382	0.602	0.571	0.629
	1.286***	0.528	-0.248	-0.340	0.441
	0.427	0.417	0.432	0.574	0.403
	1.111*	0.542	0.056	0.080	0.377
	0.653	0.526	0.747	0.659	0.787
	-0.075	-0.060*	0.021	-0.021*	-0.064
	0.067	0.081	0.057	0.077	0.073
	-0.719**	-0.421	0.106	0.020	-0.295
	0.303	0.267	0.277	0.266	0.242
	99.877***	25.035	9.896	-4.204	54.825*
	26.394	33.685	26.185	41.859	28.023
	-172.520	-107.460	48.480	-53.058	-67.844
	128.676	209.136	91.495	132.152	121.526
	-2.124**	-1.963**	-0.761	-0.502	-0.051

	0.862	0.884	0.628	0.804	0.753
	1.104***	0.598	0.467	0.303	0.440
ln(unemployment vacancy rate neighbours)	0.360	0.478	0.365	0.342	0.299
Ln(wage neighbours)	3.714	-1.658	-3.135	5.306	7.795
	4.187	5.065	4.516	5.083	5.014
	-1.259*	0.507	0.402	-0.561	-0.950
ln(crime rate)	0.759	0.677	0.719	0.804	0.828
Ln(emissions neighbours)	-0.053	-0.075	0.163	0.092	0.053
	0.116	0.192	0.151	0.102	0.124
Ln(schools neighbours)	0.221	0.182	-0.300	-0.312	-0.138
	0.229	0.409	0.217	0.261	0.198
Number of observations	422	373	509	310	410
Log Likelihood	-503,31	-473,46	-646,34	-374,65	-.495,43
H0: proportional odds (P-value)	0.03	0.00	0.16	0.08	0.00
H0: Merge Categories					
1 and 2					
2 and 3					
3 and 4	0.92				

Note: Reference categories omitted (see table 2) Values in brackets are standard errors corrected for the effects of clustering of regional variables <sup>a)</sup> Reference Category, \* (\*\*) (\*\*\*) signifies significance at the 10% (5%) 1% level respectively a) Low Education group = Persons with completed vocational education b) high unemployment regions = Regions with registered unemployment rates in excess of the national average

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## NOTES

<sup>1</sup> Noteable exceptions include Hazans, 2003, Kwiatkowski, et al, 2004 and Fidrmuc, 2004

<sup>2</sup> In this model  $\mu_1$ ,  $\mu_2$ ,  $\mu_3$  and  $\alpha$  can not be separately identified, we thus normalize  $\alpha$  to zero

<sup>3</sup> We also ran regressions including the economically inactive. This decreases significance of economic determinants of migration, but leaves the qualitative results unchanged (see Fidrmuc and Huber, 2004).

<sup>4</sup> This may imply non linear relationships between income and the willingness to migrate as found in Burda et al (1998). We include personal income linearly and squared and household income only linearly. Experimentation with higher order terms rendered all income (both personal and household) variables insignificant.

<sup>5</sup> This is measured by a set of dummy variables taking the value 1 if a secondary income is earned through private enterprise or no income is earned through private enterprise, respectively, the reference category is persons, who earn their primary income through private enterprise.

<sup>6</sup> These variables increase the explanatory power of our model substantially without changing results concerning other indicators.

<sup>7</sup> Sending region wages were dropped due to co-linearity with individual income earned.

<sup>8</sup> These are the sum of emissions of solids, SO<sub>2</sub> and NO<sub>x</sub> in tons per km<sup>2</sup>. Disagregating the emissions does not change results reported below.

<sup>9</sup> In the question under consideration no choice is given for the receiving region  $j$ . We assume individuals consider average potential receiving regions. For all indicators we calculate the characteristics of average potential receiving regions as averages across all regions (i.e.  $\hat{x}_i = [1/(I-1)][x_i / (\sum_{j \neq i} x_j)]$  with  $I$  the number of regions) except the region of residence. As suggested by equation (8) we measure amenities relative to these average receiving regions, while for wages and unemployment vacancy ratios we include them as separate variables.

<sup>10</sup> This is measured as  $\sum_{i \neq j} d_{ij} / (I-1)$ .

<sup>11</sup> These are defined  $\sum_{l \in S_i} x_l / K$  (where  $S_i$  is the set of  $K$  regions bordering on region  $i$ ) and are measured relative to the average receiving in the same way as the regional variables

<sup>12</sup> We performed a number of tests to gauge the quality and robustness of results: Hausmann tests for the appropriateness of the proportional log odds assumption underlying the logit model. These do not reject the null of proportional log odds. We also performed estimates both merging and excluding the intermediate categories and experimented with additional variables (e.g. dummy variables for the immediate border regions, and additional indicators for the settlement size). This led to no further insights. Results of these additional tests and estimates are available from the authors.

<sup>13</sup> Including higher order terms for age resulted in insignificant parameters.

<sup>14</sup> An alternative explanation could be self-selection of people less willing to migrate into family housing. In addition the wording of our question may add to the significance of the parameter, since house owners may be reluctant to move to a flat elsewhere.