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Inter – regional Mobility in Europe: A Note on the Cross – Country Evidence

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Running Title: Inter-regional Mobility in Europe

Abstract

This paper uses data on 11 EU countries to explain cross national differences in internal migration rates. We find that 89% of the variance in gross migration in current member states can be explained by variations in employment protection, international migration, the share of ownership occupied housing and the average region size of a country. Results concerning net migration rates, suggest that although disparities in unemployment are important determinants of net migration so are employment protection, long term unemployment and the share of owner occupied housing.

Key Words: Regional Labour Market Adjustment, Transition, EU - Accession

JEL – Classification: P25, J61

Introduction

A number of recent contributions suggest that migration is low in Europe. Decressin and Fatas (1995), Fatas (2000) as well as Obstfeld and Peri (2000) and Puhani (2001) all find that it may take several years or even decades before regional unemployment disparities are evened by migration. This is somewhat of a puzzle in the light of high regional disparities in Europe. According to economic theory (e.g. Todaro, 1969) migrants move from low expected income to high expected income regions to maximise lifetime utility. Thus migration incentives should increase with rising regional disparities. A number of explanations such as inefficiencies in spatial matching (e.g. Faini et al, 1997), the effects of social transfers on the search incentives of the unemployed (e.g. Fredriksson, 1999), housing market imperfections (e.g. Cameron and Muellbauer, 1998) and cultural differences as reflected for instance in attitudes towards risk (Bentivogli and Pagano, 1999) have been put forward to account for this puzzle.

Data

{Table 1: Around here}

Furthermore, data confirm the finding of low migration rates in Europe. In average less than 1% of the population change region of residence in a country within a year. Most of this migration is due to churning. Net migration rarely exceeds 0.1% of the population[1] and gross migration rates have declined in a

number of countries (Germany, Italy and Finland). The variation among countries is large, however. Gross migration rates range from 3.5% (Denmark) to 0.19% (Portugal) and net migration rates from almost 0.2% (Germany) to less than 0.02% (Belgium).

{Table 2: Around here}

Migration theory has proposed a number of variables, which could potentially explain this variance. We thus augment internal migration data by information concerning regional unemployment and income disparities (as measured by the coefficients of variation in unemployment rates and per capita GDP). We also include aggregate unemployment rates and shares of long term unemployment in unemployment, since Decressin (1994), Gordon (1985), Jackman and Savouri (1992) and Westerlund (1997) all find that high nation-wide unemployment rates and long term unemployment discourage internal migration.[2] As controls for differences in redistributive transfers, which have been considered a further factor reducing migration by some (see: Bode and Zwing (1998) for a survey) we use the average replacement rate. This was taken from Blanchard and Wolfers (1998). As a proxy for the role of housing markets we use the share of owner occupied dwellings (from Oswald, 1999). This has been found a significant impediment to migration in a number of studies (e.g. Böheim and Taylor, 1999). Also to control for potential unmeasured income components resulting from the black market economy, we

use the share of the black market economy in % of GDP (from Schneider 2002, and 1999). Furthermore, internal migration may be influenced by the external migration balance of a country (see: Borjas, 1999) or by institutions which impede on job turnover (see OECD,1999). We thus use the net international immigration from abroad (including asylum seekers) as well as measures of employment protection (from Blanchard and Wolfers, 1999).

Finally, micro-econometric evidence (e.g. Stark and Taylor, 1991) suggests that demographic factors and geography may play a role in shaping migration. Older people have a lower probability of migrating, because for them the time to earn returns on migration is lower and countries with smaller regions and a higher share of neighbouring regions may have higher migration rates[3]. Thus the share of population aged 20 to 35 and older than 45 and controls for region size and geography (by the average population and area of a region and the log of the share of neighbourhood relationships[4]) are included.

Since data on labour market institutions are available on a five-year basis only, we follow Blanchard and Wolfers (1999) and aggregate all data by forming averages for each indicator for four periods 1983-1984, 1984-1989, 1990-1994 and 1995 to 1999. For housing we take the 1980 value for the first period, the 1985 value for the second period and so on. Descriptive statistics for the resulting data set are displayed in table 2.

Method

We use this data to estimate regressions of the form:

(1) $$\ln(m_{it}) = \lambda_t + \alpha X_{it} + \zeta_{it}$$

where m_{it} are the gross and net migration rates of country i in period t, X_{it} is a vector of explanatory variables for the same country and period, λ_t is a set of period specific intercepts, α are parameters to be estimated and ζ_{it} is an error term. There are only 30 observations available. This leads to issues of multicolinearity and robustness of results across different specifications. We apply the method of Bayesian Averaging of Classical Estimates (BACE) recently proposed by Doppelhofer et al (2000) to overcome such problems. This consists of estimating each and every of the 2^k regressions conceivable in a model with k possible variables. Doppelhofer et al (2000) show that under the assumption that the marginal prior density of model j (M_j) is normally distributed, choosing the appropriate diffuse prior and assigning equal prior probabilities to all models[5] the expectation of the posterior distribution of parameters can is given by $E(\alpha \mid y) = \sum_{j=1}^{2^k} P(M_j \mid y)\hat{\alpha}_j$ and its variance as

$$Var(\alpha \mid y) = \sum_{j=1}^{2^k} P(M_j \mid y) Var(\alpha \mid y, M_j) + \sum_{j=1}^{2^k} P(M_j \mid y)\left[\hat{\alpha}_j - \sum_{j=1}^{2^k} P(M_j \mid y)\hat{\alpha}_j\right]^2 \text{ with:}$$

$$(2)\quad P(M_j \mid y) = \frac{T^{-n_j/2} SSE_j^{-T/2}}{\sum_{i=1}^{2^k} T^{-n_i/2} SSE_i^{-T/2}}$$

where T is the number of observations, n the number of regressors included and SSE_i is the sum of squared errors in the regression.

In this setup there are a number of ways to judge the significance of results. In particular Doppelhofer et al (2000) suggest focusing posterior inclusion probabilities for a variable, which can be calculated by taking the sum of

equation (2) across all specifications in which this variable is included, and on the sign certainty, which is measured as the percentage of the coefficient estimates for a variable with the same sign as the expectation of the posterior distribution of the parameters.

Results

Columns labelled (1) in Table 3 report posterior means of coefficients and their variance after running 16384 regressions for both gross and net migration rates. Also we report to what degree the posterior inclusion probability is higher than our prior (of 0.5) and estimates where the sign certainty is higher than 0.995 and 0.975 (which can be considered the equivalent to a two sided test for parameter significance at the 1% and 5% level in the standard regression framework).

Three variables (the share of immigration from abroad, employment protection and the share of owner occupied housing) are characterised by both high sign certainty and inclusion probability for gross migration rates. Three further variables are characterised by an increase of the posterior inclusion probability relative to the prior. With the exception of the average population of a region this increase is modest, however. For the coefficient of variation of unemployment rates the posterior inclusion probability is 0.64 and for the share of neighbourhood relationships it is 0.86. For net migration rates four variables (the coefficient of variation of unemployment rates, employment protection, the share of long term unemployed and the share of owner occupied housing) have both a high sign certainty and an inclusion probability. For one more

variable (share of neighbourhood relationships) the inclusion probability increases moderately relative to the prior to 0.60.

{Table 3: Around here}

This suggests that for gross migration rates four variables (the share of immigration from abroad, employment protection, the share of owner occupied housing and average population of a region) and for net migration rates the coefficient of variation of unemployment rates, employment protection, the share of long term unemployed and the share of owner occupied housing should be considered robust correlates. We were interested in how much of the variance of internal migration rates across countries can be explained by these robustly significantly variables. Columns labelled (2) in table 3 report results when focusing these variables . These suggest that the four robustly significant variables in the gross migration rate equation can explain around 89% of the total variance in the data and the four robustly significant variables in the net migration equation around 79%.

The parameter estimates also suggest that the share of owner occupied dwellings has by far the largest impact on internal migration rates. Reducing this share by 1% leads to an increase in the net migration rate of a country by 2% and the gross migration rate by between 1.9% to 1.4%. Housing market imperfections, thus may be a powerful explanation for low migration rates in Europe. A 1% higher employment protection score leads to a reduction of

internal gross migration rates by about 1% and of net migration rates by 0.6%. This stronger impact on gross migration rates is in accordance with the view that employment protection leads to a reduction in migration via reducing job and worker turnover. Finally, both the robustly negative significant impact of long term unemployment and the positive effect of regional unemployment disparities suggest that long term unemployed are less search effective and that regional disparities increase net rather than gross migration.

Conclusions

This note focuses on the cross national variance in internal migration. We find that 89% of the variance in gross migration in EU member states can be explained by variations in employment protection, international migration and the share of ownership occupied housing and average region size and 79% of the variance in net migration rates by unemployment disparities, employment protection, long term unemployment and the share of owner occupied housing. The results thus point to a strong role for explanations of low migration in Europe based on housing market imperfections, high long term unemployment rates and excessive employment protection. Furthermore, the results suggest that regional unemployment disparities create stronger migration incentives than regional income disparities.

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Table 1: Migration indicators by country and year

Country	Region Size (inhabitants)[1)]	Time period available	Gross Migration		Net Migration		Correlation[1)]	Flows between neighbour regions	
			First Year	Last Year	First Year	Last Year		share	Relative[2)]
Germany	6,170.92	1983-1990	1.32	1.06	0.07	0.17	0.35	60.94	2.39
UK	2,576.75	1985-1996	1.58	1.72	0.13	0.10	0.96	60.20	2.11
Belgium	1,133.76	1983-1995	0.92	0.99	0.02	0.06	0.93	45.78	1.83
Spain	2,187,28	1983-1999	0.45	0.60	0.08	0.07	-0.34	31.56	1.76
Italy	2,879.40	1983-1999	0.77	0.50	0.09	0.08	0.85	30.60	1.71
Netherlands	1,308.93	1983-1999	1.67	1.67	0.07	0.07	0.98	63.47	1.90
Finland	858,92	1983-1999	1.23	0.76	0.10	0.08	0.97	65.39	1.63
Portugal	1,144.50	1985-1992	0.19	0.32	0.04	0.07	-0.30	55.91	2.35
Sweden	1,106.38	1983-1999	1.50	1.58	0.06	0.15	0.93	50.62	1.49
Austria	899.19	1995-1999	0.89	0.93	0.05	0.05	0.92	63.33	2.23
Denmark	354.79	1990-1999	3.48	3.41	0.08	0.09	0.87	57.50	1.98

Notes: 1) the column reports correlation coefficients of net migration rates of regional units for the first and last period of the data set 2) share relative to the share of neighbourhood relationships. – not available

Table 2: Descriptive Statistics for variables included

	Mean	Standard Deviation.			Minimum	Maximum
		overall	between	Within		
ln(coeff. of variation in GDP)	-1.627	0.281	0.291	0.139	-2.340	-1.134
ln(unemployment rate)	2.107	0.468	0.444	0.205	1.363	3.015
ln (coeff. of variation in unemployment rates)	0.963	0.595	0.568	0.209	-0.308	1.968
ln (share population aged 20 -35	-1.487	0.058	0.048	0.036	-1.613	-1.379
ln(share population over 44)	-1.646	0.099	0.102	0.051	-1.884	-1.475
ln(share of net immigration from abroad)	0.348	0.668	0.854	0.288	-1.009	2.805
ln(average area of a region)	9.431	1.089	1.132	0.000	7.163	10.847
ln(average population of a region)	7.319	0.863	0.934	0.014	5.109	8.675
ln (share of neighbourhood relationships)	3.181	0.354	0.395	0.000	2.323	3.838
ln(employment protection)	0.930	0.462	0.414	0.068	-0.357	1.386
ln(replacement rate)	3.303	0.985	0.729	0.506	-0.472	4.210
Ln(share of owner occupied housing)	4.054	0.225	0.219	0.040	3.638	4.350
ln(share of black market in GDP)	2.815	0.313	0.338	0.105	2.212	3.318
ln(long term unemployed in % of unemployed)	3.727	0.432	0.406	0.173	2.251	4.298

Table 3: Regression Results

Dependent Variable	Ln(Gross Migration)		Ln(Net Migration Rate)	
	(1)	(2)	(1)	(2)
ln(coeff. of variation in GDP)	0.086		0.008	
	(0.182)		(0.090)	
ln(unemployment rate)	0.064		-0.053	
	(0.132)		(0.115)	
ln (coeff. of variation in unemployment rates)	0.178		0.810***	0.824***
	(0.186)$^{+}$		(0.178)$^{++}$	(0.129)
ln (share population aged 20 -35)	0.111		0.373	
	(0.567)		(0.779)	
ln(share population over 44)	0.105		-0.466	
	(0.433)		(0.660)	
ln(share of net immigration from abroad)	0.292***	0.322**	0.000	
	(0.118)$^{++}$	(0.120)	(0.107)	
ln(average area of a region)	0.026		0.035	
	(0.068)		(0.075)	
ln(average population of a region)	-0.438	-0.356***	0.023	
	0.098^{++}	0.064	(0.084)	
ln (share of neighbourhood relationships)	-0.353		-0.176	
	(0.236)$^{+}$		(0.219)$^{+}$	
ln(employment protection)	-1.156***	-0.939***	-0.514***	-0.513***
	(0.154)$^{++}$	(0.102)	(0.125)$^{++}$	(0.099)
ln(replacement rate)	0.003		-0.017	
	(0.026)		(0.039)	
ln(share of black market in GDP)	0.003		0.017	
	(0.129)		(0.135)	
ln(long term unemployment in % of	-0.094		-0.589**	-0.557***
unemployed)	(0.174)		(0.205)$^{++}$	(0.117)
Ln(share of owner occupied housing)	-1.855***	-1.403***	-2.096***	-2.149***
	(0.379)$^{++}$	(0.213)	(0.343)$^{++}$	(0.296)
Nobs	30	30	30	30
R2		0.890		0.785
R2 only period dummies		0.088		0.050

Notes: all specifications include time dummies which are not reported, Columns labelled (1): values in bracket are the standard deviations of the posterior mean of the variables.*** (**) sign certainty (share of estimated coefficients of the same sign as reported) larger than 0.99, (0.975), $^{++}$, ($^{+}$) posterior inclusion probability larger than 0.9, (0.5). Columns labelled (2): Values in brackets are conventional standard errors of the estimate *** (**)variable significant at the 1% (5%) (10%) level.

Notes

[1] The gross migration rate is the share of population of a country changing place of residence within a year, the net migration rate is the sum (across all regions) of the absolute values of the difference between in and out migration in a region (see: Fredriksson, 1999). Differences between these two measures are due to churning.

[2] This can be explained by risk averse workers preferring security in existing employment to migration with uncertain prospects when unemployment is high everywhere, and losses in search effectiveness of long term unemployed (due to human capital losses or discouragement effects).

[3] This last effect is ambiguous, however, since more regions close to each other could also decrease migration if commuting is a substitute to migration

[4] This is defined as in Footnote 3 above

[5] Doppelhofer at al (2000) advise equal priors for all models when the number of potential regressors is small, as in our case.

Appendix:

Data Appendix

Dependent Variable

The migration data of this study come from the Eurotat REGIO Database for EU countries and regional statistical yearbooks for candidate countries (Poland, Hungary, Slovakia) and the Regional Part of the National statistical yearbooks of Slovenia. Place to place data for the Czech Republic was taken from Fidrmuc and Huber (2003). We augmented this by the value for the Netherlands provided in Table 2.12 (p53) of the OECD Employment Report 2000 (1980 value of the table is taken for 1983-1984)[1] German data for the years after 1990 was excluded from the analysis, from a concern that the special situation of unification would distort results. Furthermore, in Belgium the NUTS2 regions of Brussels, Vlaams Brabant and Brabant Wallon were formed from the single region of Brabant in 1990. Thus place to place data of the three newly formed NUTS2 regions was reaggregated to a single region so as to provide on comparable regional units for all countries for the complete observation horizon. Finally, in 1989 and 1990 the flows from Alentejo to Lisboa and Centro to Lisboa in Portugal were a factor 10 higher than in all other years. Although we were unable ro determine the reason for this change these flows were omitted from a fear of the data resulting from an inputting error.

Table A1: Data Sets used Countries, time periods and nature of the data

Country	Regional Units	Nature	Time Period	Number of Regions	Average Area (square kilometres)	Average Population per Region (2000)
Germany	NUTS1	Place to Place	1975-1990	11		6.170,916
Belgium	NUTS2	Place to Place	1975-1995	9	3.391	1.133,756
Spain	NUTS2	Place to Place	1979-1994	18	28.044	2.187.283
Italy	NUTS2	Place to Place	1975-1995[a)]	20	15.066	2.879,400
Netherlands	NUTS2	Place to Place	1986-1995	12	2824	1.308,933
United Kingdom	NUTS2	Place to Place	1985-1996	2	152265	2.576,750
Finland	NUTS2	Place to Place	1981-1996	6	50755	858917
Portugal	NUTS2	Place to Place	1985-1992	7	13.129	1-444,500
Sweden	NUTS2	Place to Place	1980-1996	8	51367	1.106,375
Austria	NUTS2	Place to Place	1995-1999	9	9318	899,188
Denmark	NUTS3	Place to Place	1990-1999		2873	354,787

a) 1981 missing

Regional Disaggregation

The regions of the countries considered vary substantially in size. For Germany and the U.K. the data is available only on NUTS1 level, while for all other European member states data is available at NUTS2 or NUTS3 disaggregation. But even the size of regional units at the same level of regional disagregation varies considerably. In terms of population the largest NUTS 2 regions are in Italy with 2.6 million Inhabitants and the smallest in Denmark with 860 thousand. In terms of area the largest NUTS2 regions are in Sweden with an area of in average over 51.000 square kilometres and the smallest regions are found in the Netherlands with just above 2.800 square kilometres. This is of relevance because measured migration across regional entities will depend on the size of the region, since the larger a region the higher the probability that a move is within borders (and thus unmeasured) rather than across borders.

[1] OECD (2000) and Eurostat Data were compared for differences, in general this was small. Estimations were conducted excluding data from other sources. This led to no changes in qualitative results.

One way to assess the role of using regions of different size is to compare NUTS1 and NUTS2 level internal migration. Moving the level of regional analysis from NUTS2 to NUTS1 in Spain, Italy, Portugal, Finland and the Netherlands, has strong effects on the measured internal migration rates in Finland and Portugal only. The reason is that in these countries there is only one single mainland NUTS1 region, all other NUTS1 regions are islands (the Alands in Finland, the Acores and Madeira in Portugal). Since these islands are remote from the European mainland, migration rates are low. Effects are much less dramatic in Spain and Italy. Here internal migration rates fall by less than 0.1 percentage points when moving from NUTS2 to NUTS1 level. This relatively modest fall may be explained by regional structure: In these countries a number of NUTS1 regions (6 in Italy[2] and 2 in Spain[3]) have no NUTS2 level subregions. Thus aggregation does not remove as many migratory flows. The Netherlands, finally, are an intermediate case. Here the move from NUTS2 to NUTS1 level analysis reduces internal migration rates by about 0.6 percentage points. Similarly, net migration rate data suggests that when moving to NUTS1 level analysis reductions in net migration rates depend heavily on the member state considered.

[2] These are Lombardia, Emilia-Romana, Lazio, Campania, Sicilia, Sardinia
[3] These are Madrid and the Canaries

Table A2:

Country	Regional Unit	Gross Migration		Net Migration		Share of Churning Flows	
		First Year*	Last Year*	First Year	Last Year	First Year	Last Year
Germany	NUTS1	1.32	1.06	0.07	0.17	5.53	16.46
United Kingdom	NUTS1	1.58	1.72	0.13	0.10	7.96	5.80
Spain	NUTS1	0.39	0.52	0.07	0.04	17.13	7.38
Italy	NUTS1	0.72	0.47	0.09	0.08	12.59	17.61
Netherlands	NUTS1	1.07	1.09	0.03	0.03	2.87	3.15
Finland	NUTS1	0.01	0.003	0.002	0.0002	17.53	5.53
Portugal	NUTS1	0.02	0.03	0.005	0.014	20.00	46.67

Our analysis of internal migration at different levels of regional disagregation, thus confirms that larger regions in general generate lower internal migration rates. But the exact size of the decrease depends substantially on nation specific factors concerning regional division of regions and the geography of countries. This makes us include both measures of region size and measures of the number of regions close to one another (the share of neighbourhood relationships) in the regressions.

Data Sources and Construction for Dependent Variables

Coefficient of Variation in Unemployment Rates and GDP Level, Aggregate Unemployment Rate, Area, Population, Share of Elder in Population, Share of Younger in Population, International Migration.

Data Source:

Eurostat Cronos Database for all countries

Share of long term unemployed in total unemployment

Data Source:

OECD Employment Report, various years

Replacement Rate, Employment Protection:

Data Sources:

Blanchard and Wolfers (1999)

Share of Black Market Economy in GDP

Data Sources:

Schneider, Friedrich (2002) for 1990's

Schneider, Friedrich (2002) and sources cited therein for 1980's

Notes:

1989/1990 data was taken for the period 1985-1989, The average of 1989/90, 1991/92 and 1994/95 data for the period 1990-1994 and the average of 1994-95, 1997/98 and 1999/2000 data was taken for the period 1995-1999

Owner Occupied Housing

Data Sources:

Eurostat Cronos data base for Portugal (share of owner occupied dwellings)

Oswald, Andrew J (1999) for all other countries

Notes:

Data are provided for 1980, 1990. For 1995 and 1985 data were intrapolated (extrapolated) this was done by adding half the change between 1980 and 1990 to 1980 data for 1985 values and to 1990 values for 1995. 1980-84 data were merged with 1980 stock, 1985-89 data were merged with 1989 stock, 1990-94 data were merged with 1990 stock and 1995+ data with the 1995 stock

Robustness checks

Sources were compared for major differences

Regressions were done including housing indicators taken from EUROSTAT rather than Oswald values. This leads to similar conclusions.

Table A3: Data Available as dependent variables

	1983-1984	1985-1989	1990-1994	1995-1999
Germany	Yes	Yes	Yes	
UK		Yes	Yes	Yes
Belgium		Yes	Yes	Yes
Spain	yes	Yes	Yes	Yes
Italy	Yes	Yes	Yes	Yes
Netherlands	-	Yes	Yes	Yes
Finland	-	-	Yes	Yes
Portugal	-	Yes	Yes	-
Sweden	-	-	Yes	Yes
Austria	-	-	-	Yes
Denmark	-	-	Yes	Yes

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