International Migration and Economic Indicators in Central European Countries during the Period of the Global Economic Crisis

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Objectives

- Characteristics of changing patterns of intl. migration during the economic crisis and assessment of following trends
- Evaluation of the relationship between immigration and key economic indicators
- Formulation of a migration model based on economic indicators using adequate statistical methods

Material and methods

Methods

•Regression and correlation analysis

•Correlation analysis of immigration and other economic indicators, testing the statistical significance

Reference sample and period

•Central European EU countries

•1996–2011

Indicators

•immigration (IM), unemployment rate (UNEM), gross domestic product (GDP), net earnings (NET), vacancies (VAC), industry (IND), foreigners - stock (FOR)

Processing and evaluation

•Statistical processing (Unistat software)

Data source: EUROSTAT, Czech Statistical Office

Correlation CZ- no time leg

CZ	immigration	GDP	unemploy-ment	net earnings	vacancies	industry	foreigners (stock)
immigration	X	0.7194++	-0.7641++	0.633++	0.7169++	0.0498	0.5887+
GDP		X	-0.7413++	0.9789++	0.3734	-0.1863	0.9513++
unemploy-ment			X	-0.7375++	-0.6591++	0.1625	-0.791++
net earnings				X	0.3362	-0.2155	0.9845++
vacancies					X	0.3977	0.3370
industry						X	-0.2797
foreigners (stock)							X

Note: Correlation coefficients at the significance level: + α = 0.05; ++ α = 0.01

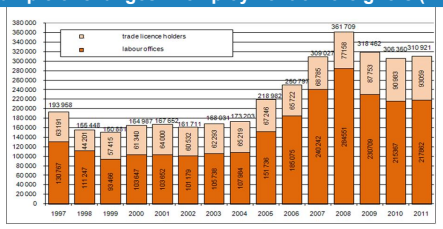
Study by Hooghe et al. (2008):
21 OECD European member countries
Reference period: 1980 to 2004

"Unemployment in receiving countries gives the best prediction of authorized migration inflows ***if the time lag is 1 year.***"

Correlation CZ – time leg 1 year

	immigration t	immigration t+1
unemployment	-0.7641++	-0.7789++
GDP	0.7194+	0.5301
net earnings	0.6330+	0.5094
vacancies	0.7169+	0.6305+
industry	0.0498	0.4237
foreigners (stock)	0.5887	0.3772

Example of changes in employment of foreigners (CZ)



Source: CZSO

Immigration facts during the peak of the economic crisis

Total authorised international immigrants: 43 million (8.5 % of population)
- from other member countries 14 million
- foreign born population: Austria 15 %, Ireland: 15 %, Finland 4 %

New immigration to EU from third countries: 3.2 million immigrants

Source countries:
- 43 % from other member countries
- 57 % from outside EU

Immigration trends:

•Generally downward tendencies in Europe but also in Australia, Japan, Turkey and South Korea

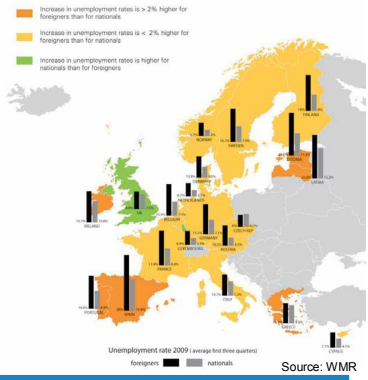
•Returns: circular migration in the EU – small increase
migrants from other countries – no increase

Increasing immigration trends in education and health care

Growing number of female immigrants - the highest in Hungary

Impact of economic crisis on unemployment of migrants and natives

Changes in unemployment rates of nationals and foreigners, in selected European countries



Source: WMR

Correlation of migration and other economic indicators in Central Europe

PL	immigra-tion	GDP	unemploy-ment	net earnings
immigration	X	0.7627++	-0.6639++	0.6738++
GDP		X	-0.6263++	0.9177++
unemploy-ment			X	-0.4235
net earnings				X

HU	immigra-tion	GDP	unemploy-ment	net earnings
immigration	X	0.6243++	0.3672	0.6935++
GDP		X	0.1954	0.9428++
unemploy-ment			X	0.3085
net earnings				X

SK	immigra-tion	GDP	unemploy-ment	net earnings
immigration	X	0.9523++	-0.9499++	0.9017++
GDP		X	-0.9577++	0.9877++
unemploy-ment			X	-0.9382++
net earnings				X

SLO	immigra-tion	GDP	unemploy-ment	net earnings
immigration	X	0.8611++	-0.8703++	0.9445++
GDP		X	-0.7790++	0.9622++
unemploy-ment			X	-0.7956++
net earnings				X

Multivariate Regression Models (CZ)

Backwards stepwise regression → OLS Regression without constant

Model 1: IM = -12286.908 * unem + 1816.3446 * gdp

	Coefficient	Std. Error	t- Statistic	Significance
UNEM	-1.2286908e+004	3.3431626e+003	-3.6752351e+000	0.0043
GDP	1.8163446e+003	3.2867282e+002	5.5263000e+000	0.0003

Residual Sum of Squares	3.5112098e+009	Adjusted R-squared	8.8254718e-001
Standard Error	1.8738222e+004	F(2,10)	4.6084343e+001
Mean of Y	4.6765667e+004	Significance of F	0.0000
Stand Dev of Y	2.9586911e+004	Durbin-Watson Statistic	7.4430831e-001
R-squared	9.0212265e-001	log of likelihood	1.3408711e+002

Model 2: IM = -8994.3378 * unem +1237.6442 * gdp + 0.33031529 * vac

	Coefficient	Std. Error	t- Statistic	Significance
UNEM	-8.9943378e+003	3.6058987e+003	-2.4943401e+000	0.0342
GDP	1.2376442e+003	4.5094004e+002	2.7445871e+000	0.0227
VAC	3.3031529e-001	1.9190995e-001	1.7211994e+000	0.1193

Residual Sum of Squares	2.6416565e+009	Adjusted R-squared	9.0181605e-001
Standard Error	1.7132349e+004	F(2,10)	3.7739857e+001
Mean of Y	4.6765667e+004	Significance of F	0.0000
Stand Dev of Y	2.9586911e+004	Durbin-Watson Statistic	8.8155439e-001
R-squared	9.2636204e-001	log of likelihood	1.3251195e+002

Conclusions

Correlation of migration and economic indicators
approved in most of the monitored countries of Central Europe
•higher correlation indices
•low residuals

Statistically highly significant results for correlation coefficients of immigration and unemployment, GDP, net earnings, vacancies (CZ)

no time lag confirmed with the exemption of unemployment

Multivariate regression (CZ)
The most suitable model for immigration: Model 2
parameters: UNEM, GDP, VAC

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