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Working Paper No. 40

**East-West Migration in Europe, 2004 - 2015**

by  
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2003

# East-West Migration in Europe, 2004 - 2015\*

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## Abstract

One of the questions in the context of EU-Enlargement is that of East-West migration. How many people will leave the accession candidate countries and how will this affect the Western European countries? This paper presents a forecast of migration between the accession countries and the EU 15 from 2004 to 2015. The forecast is based on the analysis of migration experiences from the accession of Spain, Greece and Portugal. The results of a multiple regression model show that network effects play an important role. Economic factors have a significant impact only on migration into the European countries but not on emigration. The estimated coefficients are used to forecast future migration. Between 2004 and 2015 about 3.0 million people are expected to migrate temporarily into Western European countries. Permanent migration will be about 1.7 million people. Regarding distribution Germany and Austria are mostly affected by immigration. In terms of emigration quotas Poland will be by far the main source of migrants.

**JEL-classification:** C33, E17, F22

**Keywords:** EU-Enlargement, Migration

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## 1 Introduction

On the 9th of October 2002 the European Commission recommended to close the accession negotiations with ten accession candidate countries: Estonia, Lithuania, Latvia, Hungary, Poland, Czech Republic, Slovenia, Slovak Republic, Malta, and Cyprus. These CEECs (Central and Eastern European countries) will join the European Union on the 1st of May in 2004.

This is a unique challenge for the current members of the European Union. Positive effects of the enlargement process are political stability, intensity of trade in goods and capital and cultural exchange. But there can be also negative effects. Of major concern for western economies are effects on the labour markets caused by intense migration flows from the accession candidate countries into Western Europe. Especially the current economic situation provides strong incentives for migration. Moreover the agreement of free movement for workers between the countries of the European Union plays an important role in this context. The question arises, which national arrangements regarding immigration should be considered in order to account not only for the existing migration potential of the CEECs but also for the circumstances on the labour markets of the receiving countries. The future migration potential is of particular interest, because after a transitional period of 7 years maximum, free movement of workers is granted. If migration pressure is still very high at that time, then the resulting migration could have serious effects on wages and employment. So it is of importance to know how many people will migrate.

This paper is organized as follows: Section 2 describes the economic situation of the CEECs. Section 3 provides an overview about migration theory and its implications for existing macroeconomical empirical studies. Here mostly historical migration experiences are analyzed and transferred on the enlargement situation in order to forecast migration flows. Methods and results of these studies are discussed.

Then a forecast of migration from the accession candidate countries from 2004 to 2015 is presented. It is based on the analysis of migration flows following southern enlargement. The analysis of historical migration flows is presented in section 4. In section 5 the estimated coefficients are used for forecasting migration from the first round accession candidates. The results of the forecast are compared with the results of other existing studies. A short summary and some critical remarks finish this paper in section 6. This section also provides an answer to the question whether the available forecasts can be a basis for political decisions.

## 2 Economic Situation of the CEECs

The CEECs considered in this study are Latvia, Lithuania, Slovak Republic, Czech Republic, Poland, Hungary, Estonia and Slovenia. Malta and Cyprus are not included. Both countries are small. Their economic situation is significantly better than the situation of the CEECs and not affected by a transition process in recent years. Thus, they fall into another category and major migration flows from these countries are not expected.

Bulgaria and Romania are also not included. These countries are not considered to be first-round candidates since they will not fulfill the accession criteria until 2004. An accession in 2007 seems to be possible provided that the fulfillment of the accession criteria can be granted.

In the opinion of the European Commission, the political situation in the CEECs has stabilized since 1997. Moreover, a considerable progress has been achieved in implementing the "acquis communautaire" of the European Union. Economically, the CEECs are functioning market economies and macroeconomic stability has been achieved.<sup>1</sup> Table 1 summarizes the statistical indicators of the considered CEECs.

In spite of this positive development, the income differences between the accession candidates and the current EU-members are still very high. The average GDP per capita of the CEECs, measured in purchasing power parities, has reached a level of 49% of the EU-members average. But also within the group of the CEECs there are significant differences in income. The lowest-income country is Latvia with 33% of the average EU-income. In contrast, Slovenia, the wealthiest country of the CEECs, has a per-capita GDP of 69% of the average EU-income. Inflation rates range from 1.3% (Lithuania) to 10.8% (Slovak Republic). According to European Commission (2002), a trend towards lower inflation can be noticed due to the establishment of independent central banks which follow up the objective of price stability. The transition process resulted in high unemployment rates in the CEECs. The average unemployment rate is 12.4%. Particularly high is the rate of unemployment in the Slovak Republic. Here the share of unemployed people on the overall labour force is 19.4%.

The figures indicate, that due to the large economic differences between accession candidates and current EU-members migration is likely to take place. The question is to what extent migration flows are determined by economic and social conditions. The following section deals with migration theory and findings of empirical studies.

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<sup>1</sup>European Commission (2002), p. 13-20

Table 1: Statistical Indicators of the

Country	Population in mio. inhabitants	GDP per capita in PPP (Euro)	GDP in % EU
Czech Republic	10.2	13,300	
Estonia	1.4	9,800	
Hungary	10.2	11,900	
Latvia	2.4	7,700	
Lithuania	3.5	8,700	
Poland	38.6	11,700	
Slovak Republic	5.4	11,100	

### 3 Related Literature

In this section, theories of migration behaviour and the results of empirical studies are presented. Furthermore, methodical aspects of recent studies forecasting migration from Eastern Europe are discussed. The findings are used to develop a multivariate regression model for the analysis of migration flows following southern enlargement.

#### 3.1 Neoclassical Migration Theory

In neoclassical migration theory,<sup>2</sup> spatial differences in factor endowments lead to differences in labour supply and demand. Under the assumption that marginal productivities determine factor incomes, wage differentials are generated. The consequence is migration from low-wage countries to high-wage countries until the wage differential vanishes.<sup>3</sup> In empirical studies real wages are approximated by income per capita. In order to ensure comparability, income per capita is usually transformed by purchasing power parities. Many existing studies derive a significant negative relationship between per capita income in the migrants' home countries and the extent of migration. As expected, the per capita income of the receiving country has a positive impact on migration.<sup>4</sup> Thus, migration is increasing in income differentials.

On the microeconomic level, migration is treated as an investment in human capital. The original model by Sjaastad (1962) was extended by Todaro (1969): not only income itself is considered but also the probability of achieving income. The individual aim then is to maximize expected income and, thus, expected utility. The individual migrates if the expected income in the receiving country is higher than the expected income in the home country plus migration costs. The probability of achieving income is often approximated by using unemployment or employment rates. In general, the labour market situation in the receiving country is better than that in the sending country. In this case some studies detect a significant positive relationship between labour market differentials and migration.

Neoclassical determinants of migration are used by Bauer & Zimmermann (1999). But Alecke et al. (2001) demonstrate that forecasts, that are based solely on per capita income and unemployment rates tend to overestimate future migration.<sup>5</sup> This indicates socio-economic variables have to be considered, too.

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<sup>2</sup>Bauer & Zimmermann (1999), p. 13; Delbrueck & Raffelhueschen (1993), p. 342; Massey et al. (1993), p. 433-435

<sup>3</sup>Alecke et al. (2001), p. 64

<sup>4</sup>Straubhaar (2001), p. 20; Bauer & Zimmermann (1999), p. 102; Hille & Straubhaar (2001), p. 95; Fertig (2001), p. 714

<sup>5</sup>Alecke et al. (2001), p. 70

### 3.2 Network Effects and Migration

The theory of network effects points out that costs of migration are decreasing with the stock of migrants already living in the receiving country. The reason for this is the so called network effect. A network between people of the same home country is based on common culture and origin, a common language, or on their historical background. Only the first migrant has to pay the full migration costs. Every following migrant benefits from the experiences of those who are already living there. This includes advantages regarding information, finding a job, and having a social environment. Thus, material and psychological costs of migration are reduced. This in turn leads to an increased migration. A good approximate measure of networks seems to be the number of registered migrants living in the receiving country.<sup>6</sup> But it has to be kept in mind that migrants who already obtained the citizenship of the receiving country are not included in these numbers. This data problem implies that existing networks and their effects are probably larger than suggested by the data. However, because of a lack of appropriate data, this study nevertheless uses the stock of migrants already living in the receiving country as a measure to approximate network effects.

### 3.3 Push-/ Pull-Models

In this models various push and pull factors are seen as the underlying forces of migration. Pull factors are positive factors of the origin or the host countries. They are the reason for people to stay in their home country or to be attracted to the receiving country. Push factors are negative factors pushing people out of the home country or preventing them to move into the receiving country. Such models integrate the above mentioned theories, because differences in income and employment as well as network effects can be considered as push or pull factors.

However push and pull factors regarding migration decisions are determined by two other aspects. On the one hand, there are existing migration barriers such as migration costs or institutional restraints, like restrictive immigration policies. On the other hand, characteristics of the individuals such as risk aversion or age play an important role in evaluating the push and pull factors. Figure 1 illustrates the context.

The possibilities to account for various push- and pull factors are subject of section 3.4.2.

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<sup>6</sup>see also Straubhaar (2001), p. 17; Vogler-Ludwig (2001), p. 6



Figure 1: Determinants of the Migration Decision

*Source:* Mester (2000), p. 106-107

### 3.4 Results of Empirical Studies

An early attempt to quantify future East-West migration in Europe is due to Layard et al. (1992). They draw conclusions on the basis of migration flows from Southern Europe to other European Countries and North America in the 1950s and 1960s and on migration from Mexico into the United States in the 1970s and 1980s. Layard et al. (1992) forecast that at least 3% of the population of the Eastern European population will leave their home countries.<sup>7</sup>

On the doorstep of European Enlargement, estimating migration potential from the CEECs has gained a lot of interest. Table 2 provides an overview about recent studies.

A comparison of the results is difficult because the studies differ in various aspects.

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<sup>7</sup>Layard et al. (1992), p. 24

Table 2: Empirical Studies about

Author	Subject of Analysis	Dependent Variable	S
Bauer Zimmermann (1999)	migration after southern enlargement	gross migration rates	7 ( 1
Fertig (2001)	European migration to Germany	changes in the net migration rates	4 (
Straubhaar (2001)	migration after southern enlargement	gross/ net migration rates	8 ( 1
Sinn (2001)	migration from 4 Southern European countries to Germany	stock of migrants	5 ( 9
Bruecker (2001)	European migration to Germany	stock of migrants	1 ( 1

### 3.4.1 Migration Measure

The question how many people will migrate can be answered using different measures of migration. The following measures can be subject of the analysis and aim of the forecast:

- gross migration, gross migration rates
- net migration, net migration rates
- the stock of migrants in the receiving countries.

Following the advantages and disadvantages of the different measures are described.

Bauer & Zimmermann (1999) use gross migration rates for an analysis of immigration into the European Union. With this approach, a forecast of temporary migration into the European Union is possible. A prediction of permanent migration can not be provided.

To account for permanent migration Straubhaar (2001) looks at both gross and net migration rates from southern enlargement countries into the European Union. In his study the net migration is immigration minus emigration. The ratio of this difference and the population of the sending country in the respective year is called net migration rate. With such an approach, the different factors affecting gross migration into both directions cannot be distinguished. Bauer & Zimmermann (1999) indicate that this could lead to problems if both migration flows are correlated.<sup>8</sup> Coefficients for variables having the same impact on migration in both directions tend to be overestimated. Coefficients for variables with different impacts on immigration and remigration tend to be underestimated.<sup>9</sup>

Sinn (2001) and Bruecker et al. (2002) investigate the long-term equilibrium of the stock of migrants in the receiving countries. In the forecast the expected net migration is derived from the development of the stock of migrants. These studies predict permanent migration but do not account for temporary migration. This is a considerable disadvantage, because the results of my study show that a substantial part of migration from Eastern European countries is of temporary nature.

The mentioned problems can be avoided by a separate analysis of gross migration rates for immigration and emigration between the involved countries.<sup>10</sup> Regarding the Eastern European countries, expected immigration and emigration are forecasted. Thereby the stock of migrants is modeled endogenously. As a result it is possible to forecast temporary as well as permanent migration.

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<sup>8</sup>Bauer & Zimmermann (1999), p. 23

<sup>9</sup>Brosnan (1987), p. 315

<sup>10</sup>A similar approach can be found in Vogler-Ludwig (2001).

### 3.4.2 Picturing Push and Pull Factors

In section 3.3 it was shown that characteristics of countries affect migration behaviour in the form of push and pull factors. In empirical studies there is the problem of finding quantitative measures of the various push and pull factors. Moreover, there should be no significant correlation between the regressors of a multiple regression model in order to avoid problems of multicollinearity. In real data, however, these variables are often highly correlated, especially institutional factors. A way to deal with this problem is to find a variable reflecting the entirety of country-specific factors that determine the migration between two countries.

Straubhaar (2001) suggests to use the distance between the capitals of the participating countries to picture cultural, geographical and institutional differences.<sup>11</sup> Nevertheless, he himself does not find a significant impact between distance and bilateral migration flows. Thus, it seems to be rather unlikely that country specific effects can be gathered through a distance variable. Alecke & Untiedt (2001) clarify that a distance variable is only an appropriate choice in case there is a perfect collinearity among country-specific effects.<sup>12</sup>

Those effects can be ascertained by using fixed or random effects models for panel data. In both types of models, country-specific effects are constant over time. Within a fixed effects model, a correlation between country-specific effects and regressors is assumed. Some studies<sup>13</sup> use fixed effects models to analyze migration figures, because test results indicate that country-specific effects have a significant impact on migration. A problem appears if one intends to use a fixed effects estimation for forecasting migration flows for "out-of-sample" countries. In most studies the Eastern European countries are not included in the analyzed samples. In these cases, the country-specific effects are unknown.

Fertig (2001) approaches this problem in the following way. In a first step, he estimates country-specific effects by using a fixed effects estimator. In a second regression, the influence of time-invariant variables on these effects is identified. The time-invariant variables used by Fertig (2001) are the distance between the involved countries and the value of the Human Development Index. Because both variables are known, the country-specific effects of "out-of-sample" countries can be calculated on the basis of the second regression. This approach is also used by Bruecker (2001). But it should be mentioned, that only about 60% of the variance of the estimated fixed effects can be explained.<sup>14</sup> Finally it can not be verified to what extent these approaches deliver a correct calculation of country-specific effects regarding out-of-sample

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<sup>11</sup>Straubhaar (2001), p. 17

<sup>12</sup>Alecke & Untiedt (2001), p. 381

<sup>13</sup>Alecke & Untiedt (2001);Fertig (2001);Bauer & Zimmermann (1999)

<sup>14</sup>Bruecker (2001), p. 36

countries or in which ways they can be an origin of additional errors.<sup>15</sup>

Thus, Straubhaar (2001), Vogler-Ludwig (2001) and Sinn (2001) estimate the parameters by OLS. But the result of ignoring relevant country-specific effects are inefficient or even inconsistent estimators.<sup>16</sup>

### 3.4.3 Samples for Estimation and Forecast

As can be seen from table 2, the forecasts are based on two migration experiences. On the one hand migration from southern countries into Europe or Germany is analyzed.<sup>17</sup> This approach fulfills two necessary requirements. Firstly, observations for times in which migration was not restricted are available. Secondly, the situation of the Southern European Countries at the at the time of accession was quite similar compared to the situation of the accessing CEECs. On the other hand migration flows from other European Countries into Germany are analyzed.<sup>18</sup> An advantage of this approach is the better availability of data. However, changes in general conditions, such as the recruitment of guest workers in the 1960s or the efforts to increase return migration mainly to Turkey in the 1980s, are not always acquired.<sup>19</sup>

The forecast samples usually include those countries that show the highest probability of becoming members of the European Union. An exception is the study by Sinn (2001). Here migration flows are forecasted for CEECs having the largest population sizes.

To summarize the diversity of the approaches in terms of theoretical backgrounds, estimation methods and samples lead to a large variety of forecast results. A comparison is difficult. Some studies report high migration figures, e.g. Sinn (2001), Flaig (2001), Bruecker (2001) and Vogler-Ludwig (2001). Following these studies net migration to Germany ranges from 1.7%<sup>20</sup> to 5%<sup>21</sup>. In contrast, migration figures forecasted by Bauer & Zimmermann (1999), Fertig (2001) and Straubhaar (2001) seem to be relatively low. Here gross migration to Europe is between 2%<sup>22</sup> and 4%<sup>23</sup>. Fertig (2001) forecasts a net migration to Germany of 690,000 to 726,000 persons within 20 years after enlargement.

<sup>15</sup>Straubhaar (2001), p. 10 and Flaig (2001), p. 70 are also critical of this approach.

<sup>16</sup>Baltagi (2002), p. 14-17

<sup>17</sup>Bauer & Zimmermann (1999), Straubhaar (2001), Sinn (2001), Flaig (2001)

<sup>18</sup>Fertig (2001), Vogler-Ludwig (2001)

<sup>19</sup>Vogler-Ludwig (2001), p. 12 does not account for these effects. Fertig (2001), p. 713 and Bruecker et al. (2002), p. 3 include a guest worker dummy.

<sup>20</sup>Vogler-Ludwig (2001)

<sup>21</sup>Sinn (2001)

<sup>22</sup>Bauer & Zimmermann (1999)

<sup>23</sup>Straubhaar (2001)

The following sections derive a new forecast of east-west migration. The aims are

- to distinguish between permanent and temporal migration
- to take country-specific effects into account if necessary
- to identify migration flows between each country pair.

## 4 Analysis of Historical Migration Movements

### 4.1 Data

The annual data underlying the following analysis covers a time period from 1985 to 2000. The accession countries were Spain, Portugal and Greece. Greece joined the European Union in 1981 and the accession of Spain and Portugal took place in 1986. For all countries a transitional period until the introduction of free movement for workers was agreed upon. Immigration as well as emigration is separately analyzed between these accession countries and the members of the European Union.<sup>24</sup>

### 4.2 The Regression Model

The variables that are considered in the regression model are presented in Table 3. The index  $i$  denotes the home countries Spain, Greece, and Portugal,  $j$  denotes the member countries of the European Union.

Table 3: List of Variables

$M_t^{ij}$	gross migration rates between country $i$ and country $j$
$GDP_{t-1}^j$	income per capita of country $j$ in purchasing power parities
$GDP A_{t-1}^i$	income per capita of country $i$ in purchasing power parities
$A_{t-1}^i$	unemployment rate of country $i$
$B_{t-1}^{ij}$	stock of migrants from country $i$ already living in country $j$
$PEU_{t-1}^j$	population of the receiving country
$FZ_t^{ij}$	dummy variable for the free movement of workers

<sup>24</sup>Germany, Belgium, Netherlands, Great Britain, Ireland, France, Denmark, Italy. Also Spain, Portugal and Greece are included. Austria, Finland and Sweden are considered since 1995. No data was available for Luxembourg.

$M_t^{ij}$  denotes gross migration rates. The gross migration rate is the number of migrants weighted by the population of the respective CEEC. Firstly immigration from southern enlargement countries to Northern and Western European countries is analyzed. Secondly gross migration flows from European countries into the Southern Countries are analyzed. Data for migration figures as well as for the stock of migrants are taken from the "NewCronos" database of Eurostat.<sup>25</sup>

$GDP_{t-1}^j$  denotes the gross national product per capita in purchasing power parities of the receiving countries. The corresponding variable for the countries of origin is  $GDP A_{t-1}^i$ .

$A_{t-1}^i$  denotes unemployment rates of the countries of origin. The higher  $A_{t-1}^i$  the worse are the chances of employment. That is why an increase of  $A_{t-1}^i$  is expected to lead to higher migration. In some first regressions the impact of the unemployment rates of the receiving countries was included too, but no significant impact on migration could be detected. This is not surprising since unemployment rates mainly picture employment opportunities for natives. According to Fertig (2001), migrants often face different employment situations because migrant workers are often concentrated in special fields of industry.<sup>26</sup>

$B_{t-1}^{ij}$  pictures network effects. It is the stock of migrants already living in the receiving country measured as a share of the receiving country's population. A positive effect on migration is expected.

$PEU_{t-1}^j$  accounts for the population size of the receiving country. It also pictures the size of the receiving country.

$FZ_t^{ij}$  is a dummy variable. A value of 1 indicates that in the respective year free movement of workers was possible. Free movement of workers was introduced for Greece in 1988 and for Spain and Portugal in 1992. The agreement allows workers to move freely within the member states of the European Union and to stay for the purpose of employment. Also "any discrimination based on nationality between workers of the Member States as regards employment, remuneration and other conditions of work and employment" is prohibited.<sup>27</sup> For the analysis, a positive impact of the free movement of workers on migration is expected.

Apart from the dummy variable all exogenous variables enter the regression with a one-period lag. This accounts for the fact that migration decisions are based on experiences and not spontaneous reactions to short-term economic developments.<sup>28</sup>

The descriptive statistics are shown in table 4.

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<sup>25</sup>Eurostat (2002)

<sup>26</sup>Fertig (2001), S. 715

<sup>27</sup>Treaty establishing the European Community, chapter III article 48

<sup>28</sup>see also Straubhaar (2001), p. 17

Table 4: Descriptive Statistics

Variable	Immigration		Emigration	
	Mean	Standard Deviation	Mean	Standard Deviation
$\ln M^{ij}$	-10.475	2.008	-10.169	1.836
$\ln GDP_{t-1}^j$	9.756	0.213	9.794	0.235
$\ln GDP A_{t-1}^i$	9.422	0.188	9.481	0.176
$\ln A_{t-1}^i$	2.290	0.534	2.316	0.545
$\ln B_{t-1}^{ij}$	-8.476	1.612	-8.266	1.585
$\ln PEU_{t-1}^j$	16.594	1.026	16.702	1.035
$FZ_t^{ij}$	0.700	0.459	0.792	0.407

Based on the mentioned insights of migration theory and the findings of recent studies, the following regression model is specified.

$$\ln M_t^{ij} = \beta_0 + \beta_1 \ln GDP_{t-1}^j + \beta_2 \ln GDP A_{t-1}^i + \beta_3 \ln A_{t-1}^i + \beta_4 \ln B_{t-1}^{ij} + \beta_6 PEU_{t-1}^j + \beta_7 FZ_t^{ij} + u_t \quad (1)$$

Both times a log-linear regression is preferred, because to what extent a change in an exogenous variable is followed by a change in the migration rate is determined by the levels of both variables.

### 4.3 Estimation Methods

In a first step the regression model is estimated by Ordinary Least Squares. All OLS estimations are characterized by very low values of the Durbin-Watson statistic, indicating a strong positive autocorrelation. If there is autocorrelation, the estimated coefficients are consistent and unbiased but not efficient. The necessary condition of error-term independence for estimating by OLS is violated. Some authors of other studies seem to find no evidence for the error terms to be correlated.<sup>29</sup> Vogler-Ludwig (2001) introduces a time trend allowing for autocorrelation. Fertig & Schmidt (2001) argue that the possibility of shocks that lead to a correlation of migration figures over time has to be taken into account.<sup>30</sup>

<sup>29</sup>Straubhaar (2001), p. 19; Hille & Straubhaar (2001), p. 83

<sup>30</sup>Fertig & Schmidt (2001), p. 116



A source of autocorrelation can be hidden cross-section specific effects (country-specific effects). In this study, the unit of observation is a pair consisting of the emigration and the immigration countries. Cross-section specific effects picture effects that can hardly be observed or quantified, e.g. differences between the two countries in infrastructure, educational systems, or political stability. They have different values for each country pair and are assumed to be constant over time.

In order to test for cross-section specific effects, a Breusch-Pagan test is performed. The hypothesis is that the variance of the cross-section specific effects is zero and the error terms are not affected by those effects. The empirical test statistics, as shown in table 5, reject this hypothesis.

Thus, a random-effects estimation is performed. Table 5 displays the results.

Table 5: Random-Effects Estimation

Variables	Immigration		Emigration	
	Coefficients	T-Stat.	Coefficients	T-Stat.
Constant	-32.170	-8.91	-23.953	-5.84
GDP	3.011	5.99	.214	0.39
GDPA	-2.085	-4.57	0.380	0.75
A	-0.154	-1.22	-0.054	-0.42
B	0.490	6.72	0.566	6.17
PEU	0.986	7.26	0.759	4.43
FZ	0.013	0.14	0.033	0.72
$R^2$		0,87		0,76
Breusch-Pagan Test		293		367

For the immigration equation the following results are reported. An increase of GDP per capita in the receiving countries by 1% leads to an increase of the gross migration rate by 3 percent. An increase of the GDP per capita in the home country is followed by less migration, probably because of the better living situation. The unemployment rate of the home country does not affect migration flows significantly. Furthermore this variable does not show the expected positive influence. Existing networks as well as the population size of the receiving country have a strong positive impact on migration. The free-movement dummy has a positive sign, but is insignificant. A possible

explanation for this is that almost 3% of the population of the southern accession countries had already migrated when the countries joined the European Union. Thus, the introduction of free movement for workers could not have a substantial impact on migration patterns any more.

The results for emigration are presented in column 3. There is no significant impact of economic factors, like income per capita and unemployment rate, on migration flows. Also the dummy variable is insignificant. A significant impact is shown for the stock of migrants. This leads to the conclusion, that a considerable share of migration is of temporary nature. The size of the population of the receiving country shows that the bigger the country, the more migration takes place.

Furthermore a fixed-effects estimation was performed. As explained before, in case the cross-section effects are uncorrelated with the regressors, a random-effects model has to be chosen. In case there is a correlation between cross-section specific effects and regressors, a fixed-effects model is the appropriate choice. To compare fixed and random-effects estimations a Hausman-test is performed, which is  $\chi^2$  distributed. The computed values are for immigration 16.4 and 0.1 for emigration. This points out that there is no significant correlation between cross-section specific effects and regressors. Thus the random-effects model should be preferred.

## 5 Assessing Migration from the Candidate Countries

Based on the results of the previous section migration following EU-Enlargement is forecasted. The time period considered is 2004 to 2015. Using historical migration experiences the forecast relies on two crucial assumptions. On the one hand migration patterns in both situations are assumed to be equal. This implies, that the estimated coefficients can be used for the forecast. On the other hand, a constant economic development is assumed. That means that exogenous shocks such as wars or recessions are not considered. With the forecast, three questions are answered.

- What will be the extent of migration?
- Which receiving countries are most severely affected by immigration?
- Which accession countries will experience the highest emigration?

## 5.1 Forecast Assumptions

The forecast is based on data of the year 2000. Information about the stock of migrants is also taken from 2001<sup>31</sup>, 1999<sup>32</sup> and 1998<sup>33</sup>. The reason for this is the limited availability of data. The following assumptions regarding the development of variables are made.

Population Data is taken from "World Population Prospects".<sup>34</sup> The development of the receiving country's population as well as calculations of migration rates and shares of foreign population groups are based on the medium fertility projection variant.

Income per capita in the current members of the European Union is assumed to grow at a constant rate of 2%. The development of income per capita for the CEECs is determined by country specific growth rates. These are based on the results by Gács (1999). Gács (1999) analyzes growth in twenty five transition economies from 1994 to 1998. Effects of Liberalization, initial situation (location and income level), population growth, secondary school enrolment and conflicts are analyzed. The estimated coefficients are used to forecast economic development in transitional economies. Moreover expected effects of EU-membership are taken into account. Such effects are increases in exports into European and Non-European Countries, a substantial growth of FDI as well as benefits from structural assistance programs. Table 6 shows the calculated growth rates. Gács (1999) forecasts medium term growth rates for the period 2005 to 2010. In the following forecast these growth rates are assumed to stay constant until 2015.

The rates of unemployment are taken to remain on their 2000 levels. At the moment no studies forecasting the development of unemployment rates, especially for the CEECs, are available.

The stock of migrants of the home country already living in the receiving country is modeled endogenously. That means the stock of migrants in period  $t$  is determined by the stock of migrants in period  $t - 1$  plus immigration in period  $t - 1$  less emigration in period  $t - 1$ . Natural changes of the stock of migrants (fertility and mortality) as well as nationalized migrants are not considered.

It is assumed that free movement of workers is granted.

The forecast is based on the coefficients of the random-effects estimation as presented in table 5, columns 2 and 3. Luxembourg is not included in the forecast. Due to a lack of data Luxembourg could not be included in the analysis of historical migration flows. The per-capita income of Luxembourg is as twice as high as the average income of the other receiving countries. So their

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<sup>31</sup>Austria, data from Statistik Austria (2002), p. 56.

<sup>32</sup>Denmark, France, United Kingdom

<sup>33</sup>Greece

<sup>34</sup>United Nations (2003)

migration experiences cannot reflect the immigration pattern of Luxembourg. Considering Luxembourg in the forecast leads to astronomical immigration figures. Thus, Luxembourg is not included.

## 5.2 Forecast Results

The results of the forecast are shown in table 7. Under the above-mentioned assumptions, a gross migration of about 3.0 million people can be expected in a time period from 2004 to 2015. This corresponds to a share of of the population of the accession candidate countries of 4.2%. About 2.3% of the population of the accession candidates are going to stay permanently in the receiving countries. In absolute terms this equals 1.7 million people.

The temporal development of immigration can be seen in Figure 2. Annual immigration reaches a peak in 2009 with 273,300 persons. Then annual immigration declines to a level of 238,063 persons in 2015. This should be due to a better living situation in the home countries.

The stock of migrants from the Accession Candidate Countries raises from 652,000 people in 2004 to 2,356,000 people in 2015. The annual increase of the stock of migrants becomes slightly smaller from 2007 until 2015. Figure 3 shows this development.

In terms of migration rates Austria, Denmark and Germany are mostly af-

Table 6: Assumed Growth Rates of the CEECs, 2004-2015

Country	Annual Growth rate
Czech Republic	5.19
Estonia	6.09
Hungary	4.99
Latvia	6.05
Lithuania	5.75
Poland	6.17
Slovak Republic	4.80
Slovenia	5.08
CEEC-8	5.34

Source: Gács (1999),p. 138

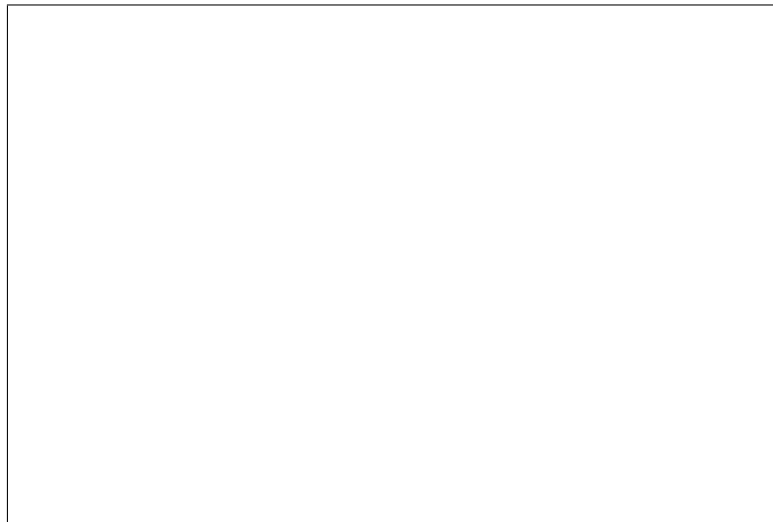
Table 7: Forecast Results (2004-2015)

Country	Cumulative Gross Migration (in 1000)	Cumulative Gross Migration Rates	Cumulative Net Migration (in 1000)	Cumulative Net Migration Rates
Czech Republic	72.2	0.70	20.9	0.2
Estonia	6.2	0.45	3.5	0.3
Hungary	141.5	1.41	64.4	0.7
Latvia	37.4	1.58	29.4	1.3
Lithuania	75.0	2.03	57.9	1.7
Poland	2,693.4	6.97	1,501.8	4.1
Slovak Republic	49.2	0.91	22.9	0.5
Slovenia	6.3	0.32	-0.2	-0.02
CEEC-8	3,081.2	4.18	1,704.6	2.30
Austria	149.3	1.84	67.7	0.84
Belgium	125.1	1.22	66.1	0.64
Germany	1,241.0	1.51	758.3	0.92
Denmark	81.3	1.52	40.5	0.76
Spain	70.1	0.18	22.7	0.06
Finland	32.3	0.62	12.6	0.24
France	433.6	0.74	249.0	0.42
Greece	12.3	0.12	-3.7	-0.03
Ireland	37.8	1.00	19.4	0.51
Italy	337.5	0.59	184.0	0.32
Netherlands	138.9	0.87	71.9	0.45
Portugal	4.3	0.04	0.0	0.00
Sweden	88.7	1.00	34.9	0.39
United Kingdom	328.1	0.55	181.1	0.30
EU-15	3,081.2	0.82	1,704.6	0.45

Figure 2: Gross Migration from the CEECs into the EU, 2004-2015 (in 1000)



Figure 3: Development of the Stock of Migrants, 2004-2015 (in 1000)



ected by migration from the considered CEECs. Some 49% of all immigrants will head for these countries every year. One reason is the economic situation of these countries which is characterized by a high income per capita and relatively low unemployment rates. This creates strong incentives for migration. Another reason is the minor geographical distance towards the accession can-

didate countries. This reduces migration costs related information or search of work and accommodation as well as transport costs. Moreover the number of people from Poland, Czech Republic and Hungary that are already living in the receiving countries is relatively high.

The main source of immigrants is Poland. This is firstly because Poland has the largest population of all accession candidate countries and secondly there are extensive networks of Polish people all over Europe. With respect to Poland it is an considerable advantage to get results about temporary and permanent migration, because nearly 50% of the overall immigration of 2.7 million people is of temporary nature. Thus 1.5 million persons will stay permanently.

In terms of migration rates also Latvia and Lithuania are significantly affected by migration. In the case of Latvia the net migration rate for the period from 2004 to 2005 is 1.3%, for Lithuania it is 1.7%. Both these countries have a per-capita GDP, that is about one third of the average EU-income. So there are high incentives for immigration into other members of the EU. A positive impact on migration could have also the intensive relationships of these countries towards Scandinavia.

For Slovenia, that is the wealthiest of the considered CEECs, a negative net migration rate is indicated. This is due to the fact, that from 2009 until 2015 migration to Slovenia exceeds migration from Slovenia into other European countries.

### 5.3 Comparison

How do the results reported in the previous section compare to those of other studies on future East-West migration in Europe? As mentioned earlier, such a comparison is difficult. In particular, different studies consider different groups of CEECs. Also in most cases the forecasted period differs. Thus, only five studies with similar settings have been compared with the results of the presented study. The comparison is shown in table 8.

My study predicts higher figures regarding gross immigration than the study by Bauer & Zimmermann (1999), in spite of the fact, that it does not include migration from Romania and Bulgaria. But for these countries Bauer & Zimmermann (1999) predict extremely high migration rates in the relevant case of free mobility. The rates are 27.73 % for Romania and 15.72 % for Bulgaria. Finally Bauer & Zimmermann (1999) point out "that it is reasonable to expect long-run emigration rates from the East to the West of between 2-3% of the population in the sending region".<sup>35</sup> That would be at least near the 4.2 % predicted here.

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<sup>35</sup>Bauer & Zimmermann (1999), p.46

Table 8: Comparison of Forecast Results

Study	Results	Results of own forecast
Bauer Zimmermann (1999)	gross migration to Europe from 7 CEECs 2 to 3% of the CEECs population	gross migration to Europe from 8 CEECs 4.2 % of the CEECs population
Fertig (2001)	net migration to Germany from 4 CEECs 690,000 to 726,000 persons	net migration to Germany from 4 CEECs 704,751 persons
Straubhaar (2001)	gross migration to Europe from 8 CEECs 3.2 to 4 million persons	gross migration to Europe from 8 CEECs 3.1 million persons
Vogler-Ludwig (2001)	net migration to Germany from 4 CEECs (excl. RU) 1,063,000 persons	net migration to Germany from 4 CEECs 716,000 persons
Sinn (2001)	stock of migrants in Germany from 4 CEECs 1.8 to 2 million persons	stock of migrants in Germany from 4 CEECs 1.1 million persons
Flaig (2001)	stock of migrants in Germany from 4 CEECs (excl. RU) 1.8 to 2.1 million persons	stock of migrants in Germany from 4 CEECs 1.1 million persons

The forecasted net migration to Germany is just within the range Fertig (2001) forecasts for different income scenarios.

The figures for gross migration and net migration to Germany presented here are lower than the predictions by Straubhaar (2001) and Vogler-Ludwig (2001). A possible explanation for this is, that the other two studies do not consider country-specific effects.

Some studies predict a very high migration potential. For instance Sinn (2001) forecasts a stock of migrants from 1.8 to 2.0 million persons in Germany alone ten years after accession. This is significantly more than the 1.1 million persons forecasted here. According to Bruecker (2001), the following reasons



are the cause of Sinn's(2001) very high figures. Firstly a linear relationship between the endogenous and the exogenous variables is assumed. Secondly the heterogeneity of data as well as country-specific effects are not taken into account.<sup>36</sup> Of equal size are the predictions by Flaig (2001), who also forecasts a stock of migrants in Germany from 1.8 to 2.1 million people depending on the scenario of income.

In this context I do not share Straubhaar's(2001) opinion that projection differences of about 1 million people are not "dramatic".<sup>37</sup> Keeping in mind that Germany will be the region expecting by far the highest number of immigrants, such differences are significant. By the way differences in predictions are often higher than just 1 million, as has been seen.

## 6 Summary and Conclusions

A forecast of migration flows between the first-round accession candidate countries and Western European countries for a period from 2004 to 2015 has been presented in this paper. Potential developments of gross and net migration flows between country pairs have been derived. An overall gross migration of 3.1 million people has been forecasted. This corresponds to a gross migration rate of 4.18 %. Net migration is about 2.3% of the CEEC's population. Thus, about 45% of overall migration is of temporary nature. Especially Germany, Austria and Denmark will be the destinations of migrants. Regarding sending countries Poland, Latvia and Lithuania will be particularly affected by migration. A comparison with the results of other existing studies shows that there is a considerable variance in the forecasts.

The problems and shortcomings of a forecast on basis of historical migration experiences have become clear. So the availability of data for the estimation of parameters is limited. This applies in particular to migration flows and stocks of migrants within European countries. Migration data before 1985 are not available. Moreover the consideration of country-specific effects in an "out-of-sample" forecast raises questions.<sup>38</sup> Firstly, it is not clear, what exactly is measured by country-specific effects. Secondly, one cannot say to what extent different approaches are able to picture these effects for "out-of-sample" countries.

Regarding the forecast assumptions, two aspects can be questioned. The first aspect is the fundamental assumption that historical migration patterns just carry over to the CEECs. Taking into account the decline of transport and communication costs, a tendency of a more temporary nature of migration

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<sup>36</sup>Dustmann (2001), p. 45

<sup>37</sup>Straubhaar (2001), p. 28

<sup>38</sup>For a detailed discussion see section 3.4.2.

seems likely. Another aspect is the assumption of a constant development of exogenous factors over a period of twelve years.

The mentioned problems and the variety of results lead to the conclusion that a great deal of uncertainty remains. Thus the use of forecasting scenarios regarding migration for political decisions is limited. Because of that, a high flexibility of migration policy has to be ensured. The possibility of a fast adjustment of arrangements to changing migration flows is very important. A possibility would be regulation by immigration quotas. This would be a way to share the advantages of migration and to avoid negative impacts on wages and employment.

Furthermore not only the number of migrants coming is important but also their cultural and social integration. Especially in this area, much remains to be done.

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