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Working Paper

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Working Paper, No. 2011:32

Provided in Cooperation with:

Department of Economics, School of Economics and Management, Lund University

Suggested Citation: Prymachenko, Yana; Fregert, Klas; Andersson, Fredrik N. G. (2011) : The Effect of Emigration on Unemployment: Evidence from the Central and Eastern European EU Member States, Working Paper, No. 2011:32, Lund University, School of Economics and Management, Department of Economics, Lund

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The Effect of Emigration on Unemployment: Evidence from the Central and Eastern European EU Member States

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ABSTRACT

This paper contributes to the scant empirical literature on the effects of emigration on source countries' labour markets. Using a novel dataset by Brücker et al. (2009), we investigate whether emigration from the Central and Eastern European (CEE) members of European Union (EU) during the period 2000 to 2007 has contributed to the decline in unemployment observed in these countries. We find that along with structural changes that occurred in the CEE economies during the last decade, emigration indeed had a strong negative effect on unemployment in these countries. A 10 per cent increase in emigration rate leads to around 5 per cent decrease in unemployment rate. Given the minor effect of immigration on host countries' unemployment found in the literature (including the studies examining the East-West European migration), this paper's results indicate that the opening up of labour markets following the enlargement of EU in 2004 mainly has had positive effects.

Keywords: emigration, unemployment, Central and Eastern Europe

JEL codes: J21, J31, J61

INTRODUCTION

In May 2004, eight Central and Eastern European countries¹ (EU-8) joined European Union. Since then almost all of these economies experienced improved labour market conditions. Specifically, unemployment rates were reduced by as much as 50 per cent, in some cases declining by 10 percentage points (Eurostat). At the same time, emigration in the region has steadily increased and, as noticed by Kaczmarczyk and Okolski (2008), "has become one of the most conspicuous population movements in contemporary Europe" (p. 1). In some source countries emigrants account for a significant proportion of the labour force: for example, in Lithuania the share of emigrants residing in EU-15 countries reached 5.6 per cent of its domestic labour force in 2007. In Poland, Estonia, and Slovakia the corresponding emigration shares were 4.8 per cent, 4 per cent, and 3.4 per cent respectively.² These developments suggest that emigration may have contributed to the decline in unemployment observed in these new member states, which we find in this study.

There are a large number of studies examining the effects of immigration on receiving countries' labour markets (for a detailed review of the literature see e.g. Blanchflower et al., 2007; Bodvarsson and Van den Berg, 2009). However, their results show that immigrants have little, if any, effect on receiving countries' labour markets. A meta-analysis performed by Longhi et al. (2006) showed that on average a 1 per cent increase in the number of immigrants induces fall in natives' employment by only 0.02 per cent.

In contrast, there are very few studies examining the effects of emigration on source countries' labour markets. Moreover, this literature is limited to exploring wage effects of emigration, mostly focusing on Mexico-US mobility (see e.g. Mishra 2006; Aydemir and Borjas, 2006; Hanson, 2007). We only know two papers which have attempted to measure the unemployment effect of emigration, and then indirectly by using simulation models (Barrell et al.,

2007; Baas et al., 2010). The lack of econometric work appears to be due to a deficit of data, since in most countries emigrants are not registered.

We employ a novel dataset by Brücker et al. (2009) to analyze the labour market effects of emigration in source countries. This dataset contains emigration data from the EU-8 countries from 2000 to 2007. The data are computed based on the stocks of immigrants from these countries in EU-15. Because Western Europe is the main destination for EU-8 migrants, especially after the EU enlargement, the collected immigration data should closely correspond to emigration stocks.

The rapid increase of emigration from the EU-8 countries following their accession in 2004 can be seen as a natural experiment that helps to identify the effect of emigration on unemployment. Unemployment can cause emigration, but emigration may also reduce unemployment whereby it is statistically difficult to separate between these two effects. However, because EU-8 migration following 2004 was caused mainly by political developments (EU enlargement) rather than conditions on the countries' labour markets, we can use this event (combined with IV variables) to control for the endogeneity problem.

Our results suggest that emigration has a strong negative effect on unemployment in EU-8 countries. A 10 per cent increase in the share of emigrants in the national labour force leads to decrease in the unemployment rate by around 5 per cent.

The rest of the paper is structured as follows. The next section outlines the background information on migration flows from EU-8 to EU-15 countries, as well as unemployment rate in EU-8 countries during the last decade. It is followed by the description of the data used, and the empirical specification. The final results are then presented and discussed. The last section summarizes the findings.

BACKGROUND

The institutional background of the 2004 EU enlargement

Joining European Union in 2004 enabled the eight CEE countries (along with Cyprus and Malta) to enjoy the four fundamental freedoms proclaimed by the Treaties of Rome in 1957. One of these freedoms is the free movement of workers. While this freedom was implemented for Cyprus and Malta straight after their accession, restrictions were imposed on the CEE countries for a seven-year transition period. According to the Accession Treaties of 16 April 2003, for the first two years after the accession, the incumbent member states could apply national rules regulating the labour mobility from EU-8 countries; for the next three years countries could choose to maintain their national restrictions or implement the Community rules. In the latter case, countries still maintained the right to impose national regulations in case of disturbances on their labour markets (the so-called "safeguard clause"). During the

last two years of the transition period countries could extend the national rules only if their labour markets experienced “serious disturbances” (Brücker et al., 2009).

Most EU-15 countries decided to impose national regulations on migration during the first two years after the enlargement. Only Sweden, the United Kingdom, and Ireland chose not to impose any restrictions. In the United Kingdom, however, work permits were initially issued only for one year, and if migrants lost their jobs, these permits could be withdrawn. Moreover, immigrants need to register with the Worker Registration Scheme (WRS) if they work in the UK for a month or more, which allows the government to monitor immigration and its influence on the labour market. In Ireland, immigrants need to get a Personal Public Service Number (PPS Number) to be allowed to work.

In subsequent years all member states have gradually turned to the Community rules. Thus Greece, Spain, Portugal, and Finland opened their labour markets to immigrants from EU-8 countries on 1 May 2006; the Netherlands on 1 May 2007; Luxemburg on 1 November 2007; France on 1 July 2008; Belgium and Denmark on 1 May 2009; and Germany and Austria on 1 May 2011 (Kahanec et al., 2010; Brücker et al., 2009).

Migration patterns in EU-8 countries

As a result of the 2004 enlargement, migration from EU-8 countries to EU-15 began to increase (despite restrictions on migration). The number of people who migrated from EU-8 to EU-15 averaged 50,000 people per year between 2001 and 2004. By 2005 the number had quintupled to 246,300, followed by 309,100 in 2006 and 405,400 in 2007 (see Figure 1).

[Figure 1]

The increase of migration flows thus started in the year 2005, one year after the accession. One possible explanation is that in the United Kingdom – the main destination country for immigrants from EU-8 after Germany – registration of new immigrants in the WRS begins only in a month or more after their employment. Because it takes some time for immigrants to find a job in addition to the possibility of their registration being much later than a month after that, there might be a lag between actual migration and its reflection in the statistical figures.

The total stock of migrants from EU-8 countries in EU-15 increased by 1.2 million people between 2000 and 2007, so that the total number of migrants had increased to more than 1.9 million by 2007. Around 87 per cent of these migration flows originated in Poland, Slovakia and Lithuania. These countries experienced large migration outflows during the period 2000-2007, both in absolute numbers and relatively to the working age population (see Figure 2).

[Figure 2]

As seen in Figure 2, the share of emigrants in relation to the source country’s working age population has increased in all countries. In Lithuania the emigration share increased by 4.6

percentage points to 5.7 per cent in 2007; in Poland and Slovakia the increase averaged 3 percentage points and 2.7 percentage points respectively (with the shares of emigrants in the labour force being 4.8 per cent and 3.4 per cent in 2007). As for the rest of EU-8 countries, the shares of emigrants in these countries increased by approximately 1-2 percentage points during 2000-2007.

Unemployment in EU-8 during 2000-2007

In the pre-accession period, the level of unemployment in most EU-8 countries was growing, peaking in the early 2000s. The highest level of unemployment was observed in Poland, where it reached 20 per cent in 2002 (with more than 3,300,000 unemployed). In Slovakia and Lithuania the unemployment rate reached 19 per cent and 17 per cent respectively in 2001; in Estonia and Czech Republic the maximum numbers were reached in 2000, with the unemployment rate averaging 13 per cent and 9 per cent respectively; in such countries as Latvia, Hungary and Slovenia the maximum level of unemployment was observed in 1998 and averaged 15 per cent, 9 per cent and 8 per cent respectively. Starting from the beginning of 2000's, unemployment rates decreased in all these countries except for Hungary (see Figure 3).

[Figure 3]

The largest decline in the unemployment rate was observed in the Baltic Countries, Poland and Slovenia. For example, in Lithuania the unemployment rate fell by 13 percentage points over seven years; in Estonia and Latvia decline in the unemployment rate equalled 9 and 8 percentage points over eight years; in Poland and Slovakia the decline amounted to 11 and 8 percentage points during six and seven years respectively (however, the share of unemployed in the active population in these countries still remained rather high, averaging 9.7 per cent and 11.2 per cent in 2007). As for Czech Republic and Slovenia, even though the unemployment rate in these countries fell relatively modestly, it was among the lowest in the region in 2007 and averaged 5 per cent. In Hungary, on the other hand, the unemployment rate followed the opposite trend: while it was decreasing during 1998-2002, it was increasing during 2003-2007 (but still remaining below its level of 1998 and averaging 7 per cent in 2007). The overall picture in the region is striking. As Rutkovski (2007) characterized it, "these developments mark an unprecedented change in labour market conditions across a large group of countries and within a short period of time" (p. 4).

DATA

Data on migration is collected from Brücker et al. (2009) who estimate the emigration stock for EU-8 countries on behalf of the Employment, Social Affairs and Equal Opportunities Directorate General of the European Commission. The sample only includes migration from EU-8 to EU-15, but migration from EU-8 to other countries is likely to be small. Unemployment and real GDP data are collected from Eurostat. The emigration and unemployment

stocks were transformed to shares of the labour force in the country of origin to be comparable across countries.

The data covers only legal migration, which implies that the true migration figures might be understated; on the other hand, establishing the free movement of labour between EU member states is likely to diminish the magnitude of illegal migration. Also, due to the possibility for the present illegal immigrants to legalize their residence in host countries, the figures on current flows of migrants might be overestimated.

Non-stationarity and cointegration properties of the data

We wish to estimate the effect of emigration on unemployment in the home country, while we control for changes in GDP. Before we estimate the model, we test the three variables for non-stationarity and cointegration to avoid spurious regression results. We test for non-stationarity using four different panel unit root tests: Levin, Lin and Chu (LLC), Im, Pesaran and Shin (IPS), Fisher Augmented Dickey-Fuller (ADF), and Fisher Phillips-Perron (PP) tests. All tests have the same null hypothesis (unit root), but different alternative hypotheses. While in the LLC test the alternative hypothesis is that all series are stationary, the alternative is that at least one series is stationary in the other tests. The latter three tests are thus less restrictive and have higher power (Harris and Solis, 2003). But, these tests also require a larger number of time observations than the LLC test. Given our limited data set (eight time observations per country), the LLC test is seen as the most reliable in these circumstances. The specification of all tests includes individual intercepts and no time trends. The results suggest (see Table 1) that all variables are non-stationary in levels and stationary in first differences.

[Table 1]

Having found that variables are non-stationary, we test for cointegration between them. Three panel cointegration tests are performed: the Kao Cointegration Test and two ADF-type Pedroni Cointegration Tests. The main difference between the tests is that the Kao Test assumes homogeneity in the parameters of the cointegrating relationship, while the Pedroni Cointegration Tests allow for heterogeneity. The two Pedroni tests differ by the method of estimating the residuals equation: the first method consists in pooling the parameters across cross-sectional units (the *within-group approach*), and the second one averages the estimated values of the parameters for each cross-sectional unit (the *group-means approach*). The latter method is thus less restrictive, and it is also found to have higher power in small samples as compared to the within-group approach (Harris and Solis, 2003).

The specifications of the Pedroni Cointegration Tests include individual intercept and individual trend. The results in the Table 2 suggest that the unemployment, emigration and GDP variables are cointegrated, with the null of no cointegration being rejected at 1 per cent and 10 per cent significance levels.

[Table 2]

EMPIRICAL SPECIFICATION

We estimate the effect of emigration on unemployment using a panel data model with fixed country effects and fixed time effects. Given that the unemployment rate, emigration rate and GDP are cointegrated, we specify a long-run relation in logarithmic levels:

$$\ln(UNEMPL_{it}) = \beta \cdot \ln(EMIGR_{it}) + \gamma \cdot \ln(GDP_{it}) + f_i + f_t + \varepsilon_{it}, \quad (1)$$

where $UNEMPL_{it}$ denotes the unemployment rate of country i at time t ; $EMIGR_{it}$ is the ratio of the number of migrants in EU-15 in relation to the national labour force; GDP_{it} is the level of real GDP per capita; f_i is a country-specific fixed effect; f_t is a time fixed effect; and ε_{it} is an error term. The country fixed-effects are included to control for differences in labour market institutions which are constant across time and time fixed-effects are included to control for common time shocks affecting all countries at the same time. The log-linear specification implies that β and γ are long-run elasticities.

A potential econometric concern is reverse causality from unemployment at home to emigration. If higher unemployment at home leads to increased emigration, the effect of emigration on unemployment would be underestimated. Since direct causality and indirect causality goes in opposite directions, the sign of β is undetermined. To isolate the effect of emigration on unemployment, we use an instrumental variable technique. We use lagged emigration as the instrument, following Altonji and Card (1991), Dustmann et al. (2005), and Lemos and Portes (2008). Social networks between previous and current migrants are known to be important determinants of migration, and therefore there is a strong correlation between past and current emigration.

The inclusion of the level of GDP rather than GDP growth follows from the non-stationarity and cointegration tests. We interpret the cointegration between the unemployment and the level of GDP between 2000 and 2007 as capturing the transition dynamics connected with structural changes in the economy, such as the reallocation of labour across sectors. Over time this effect is likely to disappear.

RESULTS

The estimates of β , the effect of emigration on unemployment, are presented in the Table 3. The specification in the first column reports the results from the OLS estimation of the equation (1). The coefficient is negative (-0.44), suggesting that emigration has a strong negative effect on unemployment, and is mainly driven by factors that are unrelated to labour market conditions in the source countries.

[Table 3]

The IV estimation presented in the second column yields a negative effect of -0.52 that is somewhat stronger than the one obtained in the previous specification, indicating some endogeneity bias in the OLS estimation.

The next two columns present some robustness checks of our estimations. Excluding GDP from the equation (1) we get an estimate of -0.79 . The increase of the effect in this specification suggests that GDP is an important factor explaining unemployment rate in EU-8 countries, and its exclusion yields an omitted variable bias. Further exclusion of the fixed effects yields a negative but rather small effect of -0.21 , indicating the importance of the unobservable country-specific and time factors in the model.

Thus the results suggest that emigration has a strong negative effect on unemployment in EU-8 countries. The cointegration form implies that the emigration effect is a long-run effect, that is, it shows the effect on the structural rate of unemployment. Numerically, it follows that a 10 per cent increase in the share of emigrants in national labour force (say, from 5 per cent to 5.5 per cent) results in decrease in unemployment rate by around 5 per cent on average (for example, from 10 per cent to 9.5 per cent). Considering the fact that in most of these countries emigration rate has increased several times during 2000-2007 (see Figure 2), it is reasonable to infer that emigration contributed significantly to the rapid and large decrease in unemployment that EU-8 countries experienced during the last decade.

One possible explanation of the long-run effect of emigration on unemployment is that the emigrants contain a higher share of population with higher than average risks of unemployment in the source country, such that the composition of the unemployment pool changes.³ In general, groups with a higher unemployment risk have a higher incentive to emigrate. Baas et al. (2010) document that the emigrants from EU-8 are younger than the native population. Since young people typically face a higher unemployment risk than older workers, there should be self-selection into emigration from the young. In addition, the young are less attached than the old to the home country by family and property. A potentially countervailing factor is that the emigrants may be more skilled than the native population. According to Baas et al. (2010), they belong to the medium-skill group. While the skill level in general reduces unemployment risks, the skills measured are education levels and do not reflect work experience. Thus the higher skill level among the young may not directly translate into lower risk of unemployment. Blanchflower et al. (2007) report that emigrants work in occupations lower than their skill level would suggest compared to natives. The authors suggest that language may be a factor, but the lack of experience from youth may also play a role. In their home country this may have resulted in unemployment, while in the receiving country the lack of experience is reflected in a lower wage.

The long-run effect on unemployment can also come about due to return migration. For example, if emigrants return to their home countries, the experience and knowledge they acquired abroad would constitute brain gain for the sending countries; moreover, as pointed out by Ivahnyuk (2005), the return migrants are very likely to open their own companies in their

home countries using the money and knowledge gained abroad, leading to an increase in the number of jobs and thus to a fall in unemployment.

CONCLUSION

We have analyzed the impact of emigration on source countries' unemployment using data from the new Central and Eastern European EU-member states. The results suggest that emigration has a strong negative effect on unemployment, with the unemployment rate decreasing by 5 per cent when the emigration rate increases by 10 per cent. This effect is a long-run effect, which can be explained by the fact that emigrants are younger than the native population with higher risks of unemployment, and also by the return migration. Since the migration literature has not provided any evidence for a negative impact of immigrants on the receiving countries' labour markets, the strong positive impact of emigration on the sending countries' labour markets is an argument for a reconsideration of the migration policies in both sending and receiving countries in favour of liberalization.⁴

The results of this paper need to be supported by further research in this area. Besides the emigration effect on unemployment, additional research concerning other labour market related issues is needed. For example, it is important to examine the impact of emigration on labour market outcomes of different skill groups in source countries; also, more attention should be paid to wage effects of emigration. All of these aspects play an important role in development of any country, and thus should be taken into account by researchers and policymakers.

NOTES

1. These include Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovenia, and Slovakia.
2. The numbers are calculated on the basis of the emigration data from Brücker et al., 2009 and the labour force data taken from the Eurostat database.
3. See Blanchflower et al. (2007) for an analogous discussion of the effect of emigrants on the structural (natural) rate of unemployment in the receiving country.
4. Several studies have examined the benefits of global "open borders". Casey (2010), for example, also describes the policy steps needed for the liberalization of international migration.

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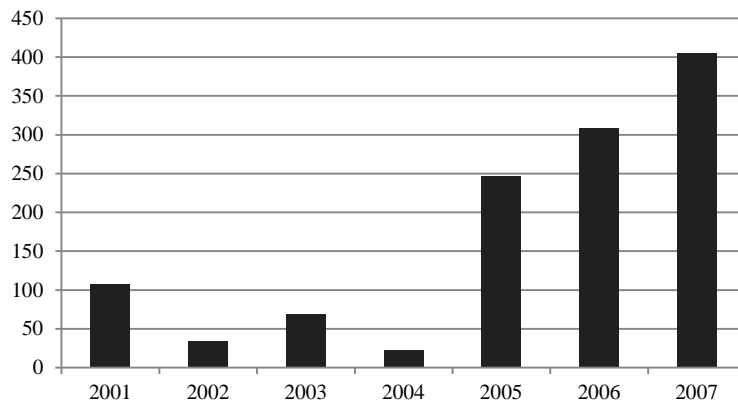
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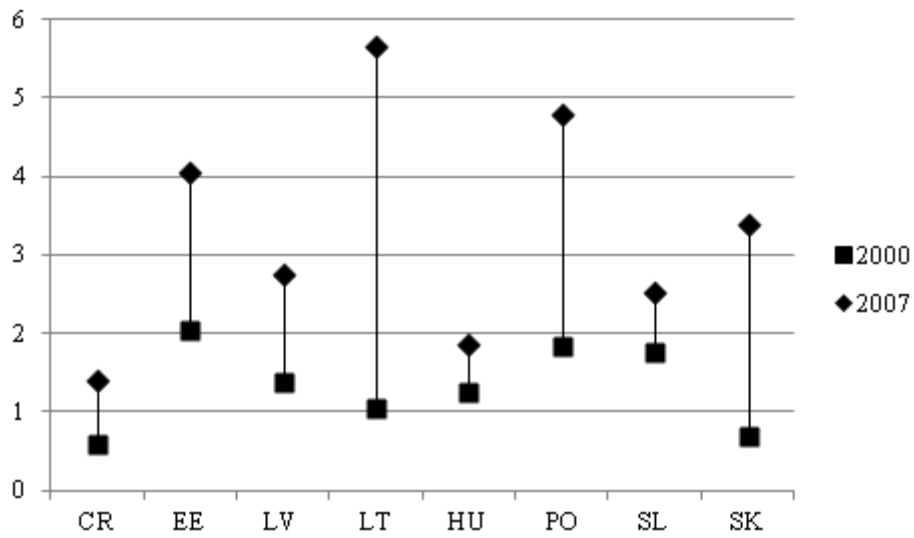
FIGURE 1

MIGRATION FLOWS FROM EU-8 TO EU-15 COUNTRIES DURING 2001-2007, THOUSAND PEOPLE



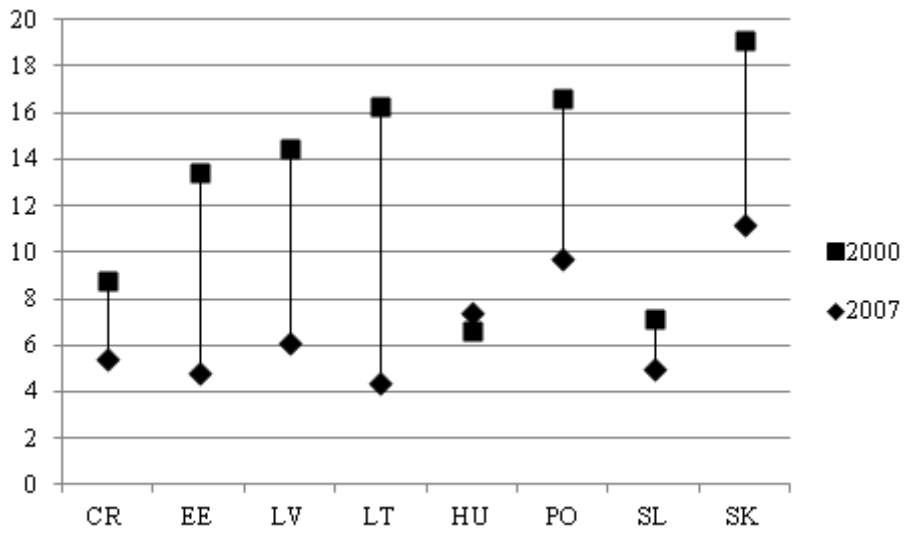
Source: Brücker et al. (2009)

FIGURE 2
SHARES OF EMIGRANTS IN THE WORKING AGE POPULATION IN EU-8 COUNTRIES
DURING 2000-2007, %



Source: Eurostat, Brücker et al. (2009), own calculations

FIGURE 3
UNEMPLOYMENT RATES IN EU-8 COUNTRIES DURING
2000-2007, %



Source: Eurostat

TABLE 1
RESULTS FROM PANEL UNIT ROOT TESTS

Variable	Test	# of lags	Statistic		Order of integration
			Levels	1 st differences	
log(EMIGR)	<i>Levin, Lin & Chu</i>	0-1	-0.66	-4.22***	I(1)
	<i>Im, Pesaran & Shin</i>	0-1	1.21	-1.62*	
	<i>ADF-Fisher</i>	0-1	11.53	31.06**	
	<i>PP-Fisher</i>		13.55	50.01***	
log(UNEMPL)	<i>Levin, Lin & Chu</i>	0-1	-0.04	-7.47***	I(1)
	<i>Im, Pesaran & Shin</i>	0-1	1.15	-3.02***	
	<i>ADF-Fisher</i>	0-1	13.08	37.62***	
	<i>PP-Fisher</i>		13.54	60.55***	
log(GDP _R)	<i>Levin, Lin & Chu</i>	0-1	4.81	-2.90***	I(1)
	<i>Im, Pesaran & Shin</i>	0-1	1.78	0.20	
	<i>ADF-Fisher</i>	0-1	7.50	17.82	
	<i>PP-Fisher</i>		9.64	27.72**	

H₀: unit root

*** denotes rejection of the null hypothesis at the 1% significance level, ** 5% significance level, * 10% significance level

TABLE 2
RESULTS FROM PANEL COINTEGRATION TESTS

Test	Statistic
<i>Kao Cointegration Test</i>	-1.44*
<i>Pedroni Cointegration Test</i> (within-group approach)	-4.84***
<i>Pedroni Cointegration Test</i> (group-means approach)	-6.69***

H₀: no cointegration

*** denotes rejection of the null hypothesis at the 1% significance level, *10% significance level

TABLE 3
EFFECT OF EMIGRATION ON UNEMPLOYMENT IN EU-8 COUNTRIES
DURING 2000-2007

Variable	Specification			
	OLS <i>(with fixed effects)</i>	IV <i>(with fixed effects)</i>	IV <i>(with fixed effects)</i>	IV <i>(without fixed effects)</i>
$EMIGR_{it}$ <i>(t-Statistic)</i>	-0.44*** (-5.04)	-0.52*** (-4.47)	-0.79*** (-5.96)	-0.21 (-1.65)
GDP_{it-1} <i>(t-Statistic)</i>	-2.40*** (-7.21)	-2.36*** (-5.33)	-	-
R^2	0.95	0.95	0.92	0.05

***denotes statistical significance at 1% level