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Labour Market Mismatches and Age Group Unemployment in Romania and Other Six CEE Countries

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Abstract

This paper aims to investigate the factors that influence unemployment rates of different age categories of unemployed focussing on those related to labour market mismatches at sectoral, occupational and educational level. Romania and other six CEE countries (Bulgaria, Czech Republic, Hungary, Poland, Slovenia and Slovakia) are analysed first in a comparative manner when the imbalances are concerned and as a group in the econometric model. The results show that unemployment rates in all the seven countries depend greatly on the economic cycle, most affected being the young. Occupational mismatches tend to a significant factor influencing mainly young and middle-aged groups, which brings into attention the need to correlate training and retraining educational programs with the evolution of the economy and labour market requirements.

Keywords: *labour market; unemployment; age groups; mismatches; panel data*

JEL Classification: *E24; F40; J64*

Introduction

In a time when apparently financial and economic crisis has been overcome, most European Union countries are facing a new challenge, the labour force crisis. On one hand, there are countries that are not able to create enough jobs and consequently people looking for work are or remain unemployed. On the other side, there are a large number of developed countries in which demographic developments tend to lead to labour shortages. Currently, at the European Union level as a whole, the most pressing problem to solve remains the high number of unemployed or better saying to find the best solutions for creating jobs and to ensure employment growth.

According to the European Commission studies (European Union[1], 2015), during the period 2008- first quarter of 2013 a total of 6.8 million jobs were destroyed. The number of jobs that

[1] European Union, *Employment and Social Developments in Europe 2014***,** European Commission, Directorate-General for Employment, Social Affairs and Inclusion, Directorate A, Manuscript completed in December 2014.

have been created was significantly lower: 1.8 million between 2008 and the second quarter of 2014. In these conditions, in the same period a number of 9 million people remained without a job, rising unemployment rate to a level of 10.8% in 2013. In 2014, among those over 24.8 million unemployed in the entire European Union, a little less than a quarter (21%) were young people, with the age between 15 and 24 years, 68% were between the age of 25 and 54 years and 11% were over 55 years.

European Union members most affected by rising unemployment and, in particular, youth unemployment are the Mediterranean countries. A category of states, whose situation in terms of unemployment it is interesting to reflect on, are those Central and Eastern European (CEE), due to their past and type of the economic activity that they inherited.

Thus, Garibaldi and Mauro[2] (2000) showed in a study on the importance of job creation the fact that some of the differences between countries in terms of success in creating jobs and reducing unemployment are represented by the historical conditions in which their economics have functioned. The countries disadvantaged from this point of view are those with a tradition in employing large shares of the labour force in agriculture or manufacturing. These historical drawbacks could have been overcome by appropriate labour market policies.

These are some reasons why this article aims to shed light on the factors that determine the level of unemployment rate for different age groups in the countries mentioned above, with a focus on various types of mismatches: sectoral, occupational, and on impact of economic growth.

A number of other authors have analysed the evolution of unemployment in CEE countries, treated as a whole. Gozgor[3] (2013), for example tested the nonaccelerating inflation rate of unemployment (NAIRU) and hysteresis hypotheses in 10 CEE countries. This author brings some arguments for why these countries can be analysed as a group. Among them, the similar unemployment trends they have had over the years, and especially after the 2008 crisis and the spillover effects determined by the location in the same region represent some of the explanations. The results of the above mentioned study show that unemployment rates were persistent in studied countries and hysteresis hypothesis is verified. That is why the author recommends appropriate monetary and fiscal policy and more consistent measures to stimulate demand as solutions to reduce the level at which these unemployment rates stabilizes.

In his paper *Unemployment in Reforming Countries: Causes, Fiscal Impacts and the Success of Transformation* published in 1999, Treier[4] addressed the problem of unemployment in CEE countries in terms of the role it can play in those countries in transition from centrally planned to market economy. The author aimed to test two hypotheses: 1) Unemployment is a threat in the transformation process of these countries; 2) Unemployment can play a positive role in private sector development through transition of the unemployed from the public to the private sector. The findings support the idea that unemployment is mainly an obstacle in job creation, and the example of countries such as Poland and Hungary reveals that one cannot speak of a positive role of this phenomenon.

Hutengs and Stadtmann[5] (2014) examined the evolution of unemployment in CEE countries focusing on differences between age groups. The authors applied an econometric model based on Okun's law in which the change in unemployment rate is regressed function of the GDP

[2] Garibaldi, P., Mauro,P., Job Creation: Why Some Countries Do Better, *Economic Issues*, No. 20, International Monetary Fund, April 2000.
[3] Gozgor, G., Testing Unemployment Persistence in Central and Eastern European Countries, *International Journal of Economics and Financial Issues*, Vol. 3, No. 3, 2013, pp.694-700.
[4] Treier, V., Unemployment in Reforming Countries: Causes, Fiscal Impacts and the Success of Transformation, *BERG working paper series on government and growth*, No. 29/1999.
[5] Hutengs, O. and Stadtmann, G., Don't trust anybody over 30: youth unemployment and Okun's law in CEE countries, *Bank i Kredyt* 45(1), 2014, 1–16.

growth rate and a dummy variable measuring the difference between age cohorts. The results proved the fact that unemployment among young people depends to a greater extent than in the case of others age groups on the evolution of economic growth in a country. Therefore, policies to reduce this phenomenon must necessarily consider growth measures, besides the other options: the investments in education and creation of appropriate qualifications.

If CEE countries are analysed separately in terms of labour market developments, several features can be highlighted. Thus, although the Czech economy has made progress towards restructuring, some problems remain. The share of people employed in agriculture and construction has reduced and the quality of the workforce increased by rising the number of higher education graduates. Still, unemployment remains a challenge, especially as the level of youth and long-term unemployment rate are quite high (Araújo and Maleček[6], 2015).

The same situation is available in the Poland case. The study of OECD[7] (2014) points to the fact that, during the last period, the economy of this country has become more competitive and disparities between social categories in terms of life standards have reduced. The main problem of this economy remains the high rate of unemployment, which hide some weaknesses of the labour market, as in other countries, inherited from the communist past: rigid labour market regulation, weak competition and so on.

Among the CEE countries, Slovak labour market is by far the most affected by the economic crisis in terms of the number of people without a job. Unemployment stabilised at a rate of 14%, several percentage points higher than other Visegrad countries (D'Apice[8], 2014). The author mentioned above points to some conditions which have favoured this situation. One of these weaknesses is represented by the sectoral economic structure, more precisely the specialization in a few capital-intensive cyclical industries.

The economy of Romania faces problems similar to those encountered by other member states of the CEE group. Cindrea[9] (2007) argues that Romanian labour market has experienced two stages of evolution: from 1990 to 2003 a restructuring period in which unemployment rate was very high and since 2003 a stage of the employment crisis, which apparently continue into nowadays due to the economy's inability to create sufficient jobs. In addition, unemployment tend to be 'highly sensitive to changes in the dynamics and structure of the national economy' (Lazăr and Lazăr[10], 2013)

In many of the developing EU countries unemployment rate is, to a large extent, influenced by the evolution of the economic cycle while job creation depends on the rate of economic growth. In this sense, Aghion[11] et al. (2010) in their paper *Fostering growth in CEE countries: a country-tailored approach to growth policy* looked for the factors that have influenced economic growth in CEE countries in the last period. According to the aforementioned authors, policies that seem to lead to sustainable economic growth are related to increasing quality of education and creating the best condition for stimulating competition, the authors stating the

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[6] Araújo, S. and Maleček, P., The Czech Labour Market: Documenting Structural Change and Remaining Challenges, *OECD Economics Department Working Papers*, No. 1213, OECD Publishing, Paris, 2015.
[7] OECD, *OECD labor market survey Poland*, March 2014, Overview.
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[11] Aghion, P., Harmgart, H. and Weisshaar, N., *Fostering growth in CEE countries: a country-tailored approach to growth policy*, European Bank for Reconstruction and Development, Working Paper No. 118, prepared in October 2010.

need to increase investment in these two directions. Moreover, given the era of globalization we are going through, Kilic[12] (2015) points to the fact that developing countries could take advantage of this phenomenon and rise their economic growth rates by 'increasing their participation rates to international organizations, encouraging international trade and foreign direct investment and increasing the level of political globalization by higher participation in political decisions in the international arena'.

This paper is organized into five parts. The next section's subject of this article is the descriptive statistics of the development of unemployment by age groups with a focus on differences and similarities between the 7 countries (Bulgaria, Hungary, Czech Republic, Poland, Romania, Slovenia and Slovakia) and the relationship with economic growth (GDP rate of growth). Section 3 presents the database used in this study and the methods applied for measuring mismatches and their impact on unemployment rates. The results of the models are presented and commented in section 4. Conclusions are summarised in section 5.

Descriptive Statistics

The literature addressing the situation of CEE countries labour markets has shown that, although all these economies have been subject to a process of restructuring, they have not been able to ensure an economic structure capable to overcome the financial crisis without sacrificing a part of the workforce. Basically, these countries' economies are not competitive enough to create the required number of jobs in order to stabilise unemployment at an equilibrium rate sufficiently low and to ensure youth the chance to find a job in their own country so that the unemployment rates among young people not to reach the alarming rates of today.

Thus, statistical data show that during the period 1998-2014, total unemployment rates in 7 CEE countries (Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovenia and Slovakia) evolved from a median value of 8.15% in 1998 to 5,8% in 2008 and 9% in 2014. Almost the entire time span, Slovenia was the country which registered the highest unemployment rates. Thus, for a long time, the difference between the lowest and highest unemployment rate reached 14.3 percentage points in 2002 between Poland (19.9%) and Hungary (5.6%). Currently the gap has shrunk to 7.1 percentage points between Slovenia (13.2%) and Czech Republic (6.1%) (Figure 1).

The unemployment rates among young people followed the same pattern of evolution as total unemployment rate, but at much higher levels, in each country more than twice the overall rate. Thus, the median was 17.2% in 1998, 17.3% in 2008 reaching 23.8% in 2014. Countries that have managed over the period to maintain the lowest youth unemployment rates were the Czech Republic and Slovakia (Figure 1).

Until 2008, the unemployment rate among older unemployed (55-64 years) has recorded the lowest values compared to other age cohorts, but it seems that the economic crisis has led to a considerable increase in unemployment of this group of persons. As proof, the median unemployment rate in 2014 was approximately 48% higher than in 1998 and more than 30% higher than that recorded in 2008. From a minimum of 0.5% recorded in Romania in 2008 it come to a maximum of 11.7 % registered in Bulgaria in 2014 (Figure 1).

[12] Kilic, C., Effects of Globalization on Economic Growth: Panel Data Analysis for Developing Countries, *Economic Insights – Trends and Challenges*, Vol.IV(LXVII), No. 1/2015, pp. 1 – 11.

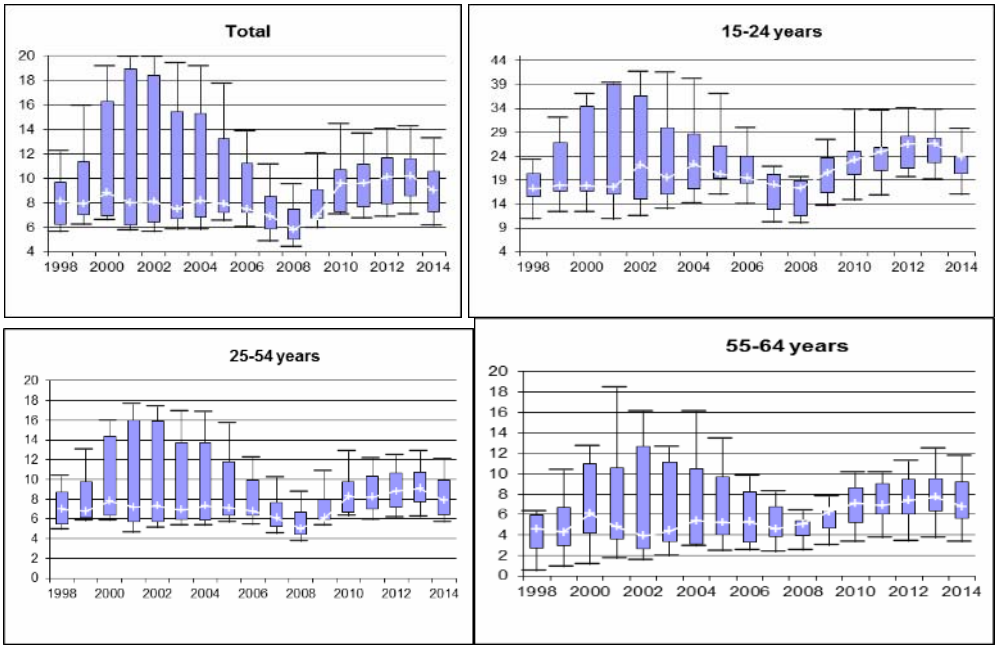

Fig. 1. Unemployment rates in 7 CEE countries by age groups, 1998-2014 (box plots)

Source: own computation based on ILOSTAT, 2015

At first glance, the evolution of unemployment in the aftermath of the economic crisis demonstrates that this phenomenon largely depends on the economic cycle. Thus, analysed in terms of the median values, the evolution of the GDP growth rate in the period 1998-2014 is oscillating. Except for a significant decrease in this indicator in 1999, until onset of the crisis in 2008, GDP real growth rate was one upward trend. It started from a median of 3.5% in 1998 and reached a peak in 2007 of 6.7%. The year 2009 registered the lowest median value of the entire period, of -5.3%, when Slovenia recorded the most drastic drop in GDP growth rate, of 7.8%, while the highest rate was in Poland, of 2.6%, in the same year (Figure 2).

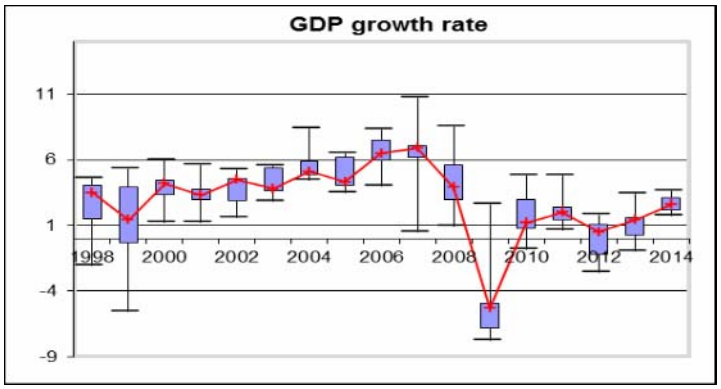

Fig. 2. GDP growth rates in 7 CEE countries, 1998-2014 (box plots)

Source: own computation based on EUROSTAT Database, 2015

Poland was the only country in the group of seven who managed to avoid the economic downturn in the period after 2008, when all other countries went into recession. This explains the increasing disparities within the group, proving that some countries were more prepared than others economically and politically to face such a shock.

Data and Methods

In this article, the quantitative research was aimed at assessing the impact of labour market mismatches within sectors of activity, types of occupations and education levels on the unemployment rate in three age categories: 15-24 years, 25-54 years and 55-64 years.

Data on the number of unemployed and the unemployment rate in the 7 countries during 1998-2014 were extracted from ILO database (ILOSTAT database 2015) and data on real GDP growth rate has been extracted from the Eurostat (National Accounts).

Quantitative analysis began with calculation of imbalances in each country at 6 branches of activity (*Agriculture, Manufacturing, Construction, Mining and quarrying; electricity, gas and water supply, Trade, transportation, accommodation and food, and business and administrative services, Public administration, community, social and other services and activities*), 6 types of occupations (*Managers, professionals, and technicians, Clerical, service and sales workers, Skilled agricultural and trades workers, Plant and machine operators, and assemblers, Elementary occupations, Armed forces*) and three educational levels (*basic, intermediate, advanced*).

These imbalances were calculated as mismatch indexes or coefficients of variation using the following formula:

$$MI = \frac{\sum_{i=1}^{N} (u_i - \overline{u})^2 / N}{\overline{u}} * 100 \quad (1)$$

where u denotes unemployment rate, $\overline{u}$ is the total unemployment rate, i refers to different categories (sectors, occupations, levels of education).

Unemployment rates of sectors and occupations were calculated based on data obtained from the ILO database as the percentage share of the unemployed in total unemployed and employed population. The coefficients previously calculated became control variables in an econometric model based on Okun's law.

Among the possible variants of equations, the dynamic version has been chosen (Smith[13], 2010).

$$\Delta u_{it} = \alpha_i + \beta g_{it} + \gamma \Delta u_{it-1} + \sum_i \lambda_i \cdot X_{it} + \varepsilon_{it} \quad (2)$$

where Δu_{it} is the change in unemployment rate, g_{it} represents the real growth rate of GDP, X_{it} includes other control variables related to mismatches.

Results

As previously mentioned, studying the impact of sectoral, occupational and educational mismatches on unemployment rates by groups age involved calculating mismatches indexes as coefficients of variation. These indexes obtained, for each country, in the period 1998-2014, aim to measure the homogeneity of unemployment distribution by sector, occupation or education levels.

Using unemployment rates at sectors level, the calculations have identified two groups of countries, in terms of the magnitude and time evolution of these coefficients of variation. The first group includes the Czech Republic, Hungary and Slovakia, where sectoral mismatches are

[13] Smith, R., *Okun's Law*. Applied Statistics and Econometrics, Birkbeck February 2010.

low compared to the other CEE countries and have a relatively stable time evolution, with a decreasing trend after the year 2009 (Figure 3).

In these countries the degree of heterogeneity has been determined by the unemployment rates in sectors as construction, manufacturing and agriculture, much higher than in other industries.

The second group of countries regarding the size of the coefficients of variations among sectors is made of Bulgaria, Poland, Romania and Slovenia, countries experiencing higher imbalances and less stable time evolution. The differences inside this second group of countries were larger in the period before the crisis and diminished after. Bulgaria is the only group member which started from a relatively low level of mismatches and has experienced a clear upward trend along the period (Figure 3).

The time evolution of the sectoral mismatch indexes have shown that both around the 2000s and in the period after the economic crisis, most affected sectors by rising unemployment were industry, construction and agriculture, some being the subject of restructuring (industry, agriculture), some largely depending on economic cycle (construction).

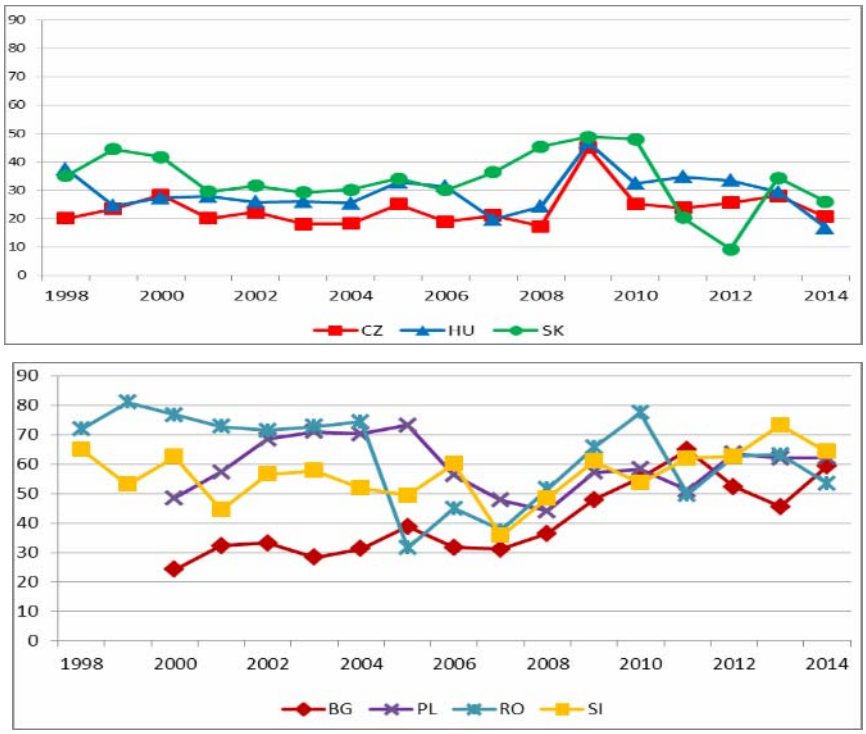

Fig. 3. Sectoral mismatches indexes in 7 CEE countries, in 1998-2014 (%)

Source: own computation based on ILOSTAT, 2015

Regarding occupational mismatches, the group of seven CEE countries is more homogeneous both in terms of the level and time evolution. The homogeneity of unemployment distribution by occupations is lower than the distribution by sector and time evolution shows an increasing trend. This situation is caused primarily by a declining demand for workers in the elementary category of occupations, but also for other two categories: *Plant and machine operators, and assemblers* and *Skilled agricultural and trades workers.*

Of the seven countries analysed, Czech Republic appears as the country with the largest mismatches between occupations, which proves increasingly demand for occupations at the upper end of the occupations spectrum and possible lag behind in terms of training of the labour force according to labour market demands (Figure 4).

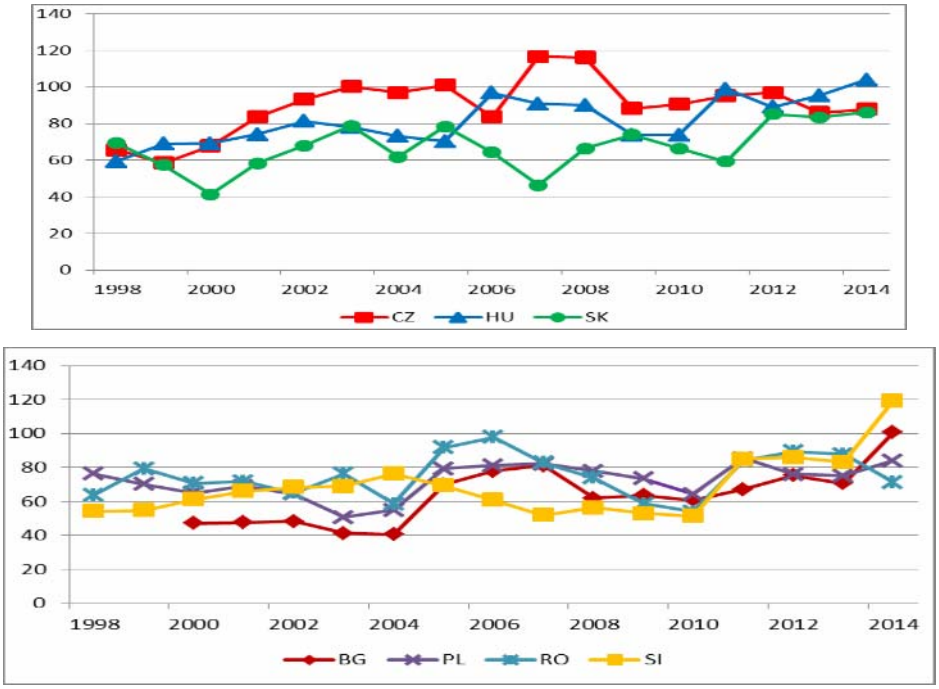

Fig. 4. Occupational mismatches indexes in 7 CEE countries, in 1998-2014 (%)

Source: own computation based on ILOSTAT, 2015

Analysed from the perspective of educational mismatches using the coefficient of variation among three levels of education (basic, intermediate, advanced), the situation of the seven CEE countries shows that some of them have evolved over time like a couple. Thus, in the Czech Republic and Slovakia mismatches are high and growing. Hungary, Poland and even Bulgaria (after 2005) registered medium values of the mismatches indexes, while Romania and Slovenia recorded the lowest level of heterogeneity. It is worth noting that Romania is the only country where this indicator is in decline (Figure 5). The explanation of such relatively high and increasing mismatches is the fact that once with the developing of the economies, labour market needs especially educated people, increasing the unemployment rate among those with a basic level of education compared to other categories.

In Romania, the discrepancies are low and declining, seeming that, in this country, for those with low education levels it is as easy or hard to find jobs as other categories.

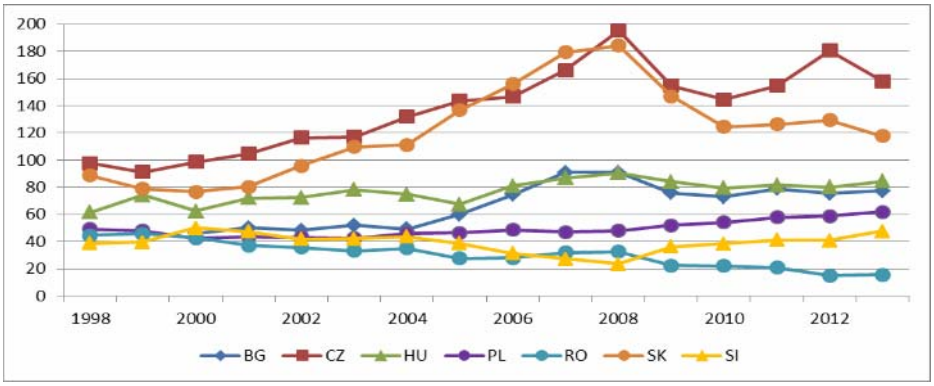

Fig. 5. Educational mismatches indexes in 7 CEE countries, in 1998-2014 (%)

Source: own computation based on ILOSTAT, 2015

For the 7 CEE countries treated as a group and the period 1995-2014, several regression models have been ruled, including at first all the control variables (sectoral, occupational and educational mismatch indexes) trying to explain the variation in dependent variable (the change in unemployment rate) for three groups of unemployed (15-24 years, 25-54 years and 55-64 years and over). Among these factors, only occupational mismatch index seems to exert consistent influence on dependent variable for the first two groups of persons, young and middle-aged while educational mismatch index proved to be a factor of influence on the last group of unemployed.

The results of the regression models presented in Table 1 include six models, two for each age group (cross section fixed effects were included).

Table 1. Regression results based on a panel database composed of 7 countries, 1995-2014

Dependent variable Δu	**15-24 years**		**25-54 years**		**55-64 years**	
	M1	M2	M3	M4	M5	M6
GDP growth rate	-0.433*** (0.086)	-0.487*** (0.081)	-0.165*** (0.035)	-0.186*** (0.032)	-0.092** (0.047)	-0.141*** (0.044)
One lag dependent variable	0.242*** (0.081)	0.274*** (0.077)	0.324*** (0.082)	0.352*** (0.074)	-0.157* (0.090)	-0.125 (0.090)
Occup. mismatch index	-0.013 (0.024)	-0.041** (0.019)	-0.008** (0.010)	-0.018** (0.007)	0.011 (0.013)	-
Sect. mismatch index	0.054* (0.031)	-	0.019 (0.013)	-	0.041** (0.017)	-
Edu. mismatch index	-0.001 (0.017)	-	-0.002 (0.007)	-	-0.021** (0.009)	-0.014* (0.008)
Intercept	0.094 (2.401)	4.373*** (1.503)	0.389 (0.987)	1.809** (0.587)	-0.577 (1.317)	1.638** (0.687))
Cross-section fixed effects	YES	YES	YES	YES	YES	YES
Adjusted R-squared	0.400	0.380	0.415	0.414	0.112	0.069

Source: own computation based on ILOSTAT and EUROSTAT, 2015

Regression coefficients: * significantly different from zero at the 0.1 level of significance; ** significantly different from zero at the 0.05 level of significance; *** significantly different from zero at the 0.01 level of significance (standard errors are in brackets)

Adjusted R squared has the highest values for the middle age group which means that unemployment rate of this category depends to a greater extent by the factors chosen as independent variables: economic growth, past trends of the unemployment rates and mismatches, than for the other age groups. In addition the factors mentioned above seem not to have a significant influence in the case of older employees' unemployment (Adjusted R squared with very low values).

The coefficients of the first explanatory variable, GDP real growth rate, (with the highest values in the first two models) demonstrate that young unemployed are the most affected by the evolution of the economy of a country in terms of GDP growth. This is confirmed by the fact that recent economic downturn has resulted in a significant increase in youth unemployment rates. In addition, young people seem to be most affected by labour market imbalances concerning the unemployed distribution on types of occupations. Unskilled young people have the most difficulty in finding a job.

Middle-aged people are the ones for which the adaptation to new economic and labour market conditions has been the fastest. Unemployment rates of this age group suffered the most rapid adjustment process as demonstrated by the coefficients obtained for the lagged dependent variable (they are negative and are the highest values for this age group).

As for mismatches, only those related to occupations seem to have a significant impact on the first two age groups and to be more important for the young unemployed. These results can be explained by the fact that jobs for middle-aged people and above are better protected by labour market legislation, unlike the situation of young people for which jobs are sometimes short-term and more uncertain. Mismatches between people qualifications and job requirements cannot be covered in young people case by experience as in the case of the other age groups. For people over 55 years, educational mismatches appear to significantly influence the unemployment rate. A low level of education is associated with a higher unemployment rate for this age group.

Conclusions

The main aim of this paper was to assess the impact of different factors related to labour market mismatches on unemployment rates at three age groups level in Romania and other six CEE countries (Bulgaria, Czech Republic, Hungary, Poland, Slovenia and Slovakia).

Labour market imbalances have been analysed using the coefficients of variation or mismatch indexes calculated for categories such as: sectors, occupations and education levels. Thus, sectoral mismatch indexes demonstrated that in two periods of time (around the 2000s and the years after the economic crisis), most affected sectors by rising unemployment were industry, construction and agriculture, some being the subject of restructuring (industry, agriculture), some largely depending on economic cycle (construction).

The variation among unemployment rates at occupation level in the same countries proved to be larger than the variation at sectors' level and experienced an increasing trend. This situation is caused primarily by a declining demand for workers in the elementary category of occupations, but also for other two categories: *Plant and machine operators, and assemblers* and *Skilled agricultural and trades workers.* For Czech Republic and Slovakia, the educational mismatch indexes registered very high values. These results can be explained by the structure of these countries economy and the increasing need for educated workers. Low educated people are more prone to become and remain unemployed.

The seven countries has been treated as a group in the econometric model considering their similar historical conditions related to the communist past, the inherited economic structure, the same labour market weaknesses (rigid labour market regulation, weak competition and so on), spillover effects due to their geographical position.

The results of the 6 models suggests that for young people looking for work is more difficult to find a job than for other age categories when economy is in recession, which brings into attention the need to correlate training and retraining educational programs with the evolution of the economy and labour market requirements.

It is worth noting that unemployment rates of middle-aged people record the lowest degree of persistence over time or in other words, for this group of people the adjustment process is the fastest. Unemployment rates of the older employees are relatively low and depend insignificantly by the economic cycle, past trends or mismatches. Occupational mismatches appear to be a factor with significant influence only for the first two categories of unemployed, young and middle-aged, this is because in the analysed countries unemployment among unskilled workers is rising because labour markets needs especially well-qualified people.

These are just a few reasons that explain the strong need for adaptation of qualifications offered by education institutions to labour market requirements, even to anticipate them, and to design educational needs as a process of lifelong learning. In the seven countries analysed, unemployed situation depends greatly on the economy evolution. Governments are called to take action in order to sustain employment growth meaning to ensure a business environment more competitive and able to create more and high quality jobs.

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