Competitiveness and Economic Growth in Romanian Regions

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Abstract

Considering the fact that Romanian economy competitiveness is not based on innovation and investment in human capital, this study makes an empirical evaluation of the impact of occupation and unemployment in Romanian counties on the economic growth. The approach based on panel vector-autoregressive (panel VAR) models indicated a negative impact of occupation and activity rate in 42 Romanian counties on the economic growth during 2006-2014. On the other hand, the real economic growth was achieved at high unemployment rates. These results are contrary to previous studies in literature and are due to a structural economic crisis and to lack of labour productivity and investment in human capital. Further policy measures should focus on structural unemployment decrease, more skilled labour force according to labour market needs, lifelong learning, higher performance and quality of education system, promotion of social inclusion, poverty control.

1. INTRODUCTION

In our knowledge-driven society, regions are the key units in the organization and in the governance of economic growth. In other words, the regions are the wealth creation. The modern approach suggests that regions are economic entities that should grow by using innovation and their knowledge as essential determinants of regional competitiveness (Audretsch et al., 2016). The economic theory considers human capital to be the key component that ensures competitiveness at regional level. In achieving a well-qualified human capital, the universities have an important role. For example, Guerrero et al. (2016) showed that for 102 universities from 12 EU countries, social measures like talent of human capital had a stronger impact on regional competitiveness than economic factors like GDP per capita.

Considering the labour market issues in Romania, the main aim of this paper is to assess the impact of regional labour market on the economic growth from the perspective of economy competitiveness. Romania is a country with competitiveness that is based on exports, but a higher quality of labour resources is required to improve the country position in the European Union. The National Strategy for Competitiveness proposed key actions regarding the development of independent activities, lifelong learning for employees, transnational mobility of labour force, equal chances for men and women on the labour market, reconciliation between professional and private life, etc. A higher productivity on the labour market is needed to ensure a sustainable economic growth.

The competitiveness has been analysed at local, urban and regional level. In the global economic context, the regions are engines of the entire economy. The competitiveness at national level is studied using the components of regional competitiveness. The activities are coordinated at regional level and the public policy is regionalized. As Melecký (2011) recommended, new measures of policy intervention are required in order to improve the regions' competitiveness.

There is not a unique perspective regarding the concept of competitiveness. The issues regarding the regional competitiveness were analysed in the context of social and economic cohesion (Chilian, 2011). This objective might be achieved by having the monetary union (Petrakos et al. 2011). The definition given by Martin (2003) for regional competitiveness reflects the capacity to provide goods and services to satisfy the market's needs by maintaining sustainable incomes of high levels. Gardiner et al (2004) proposed two approaches for studying the regional competitiveness: the competitiveness as an aggregate of companies' competitiveness, and the competitiveness based on macroeconomic performance. In our research, we will focus on the macroeconomic perspective with a framework that includes juridical and political aspects to encourage competition. The main determinants of competitiveness are related to fiscal, commercial, monetary and budget policies, but also policies regarding consumer protection, exchange rate or competition (Annoni and Kozovska, 2010). The limitation of this approach is given by the fact that some laws could not be applied at microeconomic level. The lack of any mechanism for macroeconomic adjustment does not allow any translation at regional level.

Each region has economic agents and structures that are very competitive and even non-competitive. However, some common features might be identified in each region that influences the competitiveness of all companies in that region. These features refer to social and physical infrastructure, labour force qualification and public organisms' efficiency. According to Gardiner et al (2004), the competition between the regions in a country and the regions from different countries might exclude a region from a sector where a comparative advantage could be realized. On the other hand, this competition might exclude a region from a sector where a comparative advantage could be maintained.

The regional competitiveness is necessary for efficient resources' use and the population welfare, but also for sustainable development in all the regions in a certain country. The competitiveness at regional level should be focused on sustainable development.

In Romania, the assessment of regional competitiveness is related to the possibility of accessing European funds to achieve sustainable development. The studies related to regional competitiveness in Romania are based on various methods: the per capita GDP decomposition (Vincze, 2003; Chilian & Iordan, 2012), the indices of competitiveness (Muntean et al, 2009; Annoni & Kozavska, 2010), an analytical and hierarchical process (Stănculescu, 2014), the aggregation of criteria from domains regarding the efforts of business environment, government and civil societies for achieving high competitiveness (Mereuta et al, 2007), the use of panel data models (Chilian et al, 2014). The decomposition method was also applied for checking the impact of tourism on the economic growth on a sample of 131 countries during 2000-2010 (Webster & Ivanon, 2014). The evidence showed that tourism still does not have a positive impact on the national economic growth. Recent recommendations for achieving a competitive economy are related to logistics clusters that exhibit many advantages of industrial clusters: higher productiv-

ity because of the shared resources and suppliers availability, better human networks with knowledge sharing, easier communication, higher trust between firms in the cluster, training programs (Sheffi, 2013). Pablo-Romero et al. (2016) analysed the relationship between competitiveness, economic growth and tourism.

In this study, the panel data approach was used to study the factors that ensure the economic growth at regional level in Romania during 2006-2014. This method has the advantage of making the translation of results from regional level to national level possible.

The study includes several sections. After introduction, a short literature review is made. The panel data models are proposed for 42 Romanian counties, including the capital- Bucharest. The last section brings conclusions.

2. REGIONAL COMPETITIVENESS ASSESSMENT

Two directions of analysis are presented in this section: common methods for assessing the regional competitiveness and empirical studies regarding the relationship between competitiveness and economic growth.

An assessment of regional competitiveness was made by OECD using indicators and statistics of the Regional Database. The factors ensuring increase in competitiveness were considered in economic policies.

The economic literature proposed the use of competitiveness indices for measuring the competitiveness. Most of the global competitiveness indices are used at national level. There are indices that are utilized at regional level: European Competitiveness Index, World Knowledge Competitiveness Index, the United Kingdom Competitiveness Index proposed by Robert Huggins Associates and the Atlas of Regional Competitiveness of Eurochambers. Berger (2010) found 46 studies based on aggregate indices for evaluating the regional competitiveness. The aggregation used equal or unequal weights, the number of individual indices being 246 indices. Annoni and Kozovska (2013) used 11 pillars to compose a regional competitiveness index for Europe: infrastructure, macroeconomic stability, education quality and lifelong learning, institutions, labour market efficiency, health, market dimension, technological progress, business modernization and innovation.

A method based of a set on indices was proposed by Sujová and Hlaváčková (2015) to measure the competitiveness in wood industry in the Czech Republic. However, it is difficult to use an aggregate indicator in assessing the regional competitiveness, because the individual indices are inter-correlated. On the other hand, the determinants of competitiveness could be identified and the results of it could be explained. Another competitiveness indicator was proposed by Danon and Agglomerations (2014) for European regions using three dimensions: primary dimension (physical infrastructure, institutions, health, macroeconomic stability, primary and secondary education), efficiency dimension (labour market, human capital demand, tertiary education), and innovation dimension (human capital supply, IT infrastructure and innovation).

The most utilized method for measuring regional competitiveness remains the decomposition of aggregated indices at macroeconomic level (Pichierri, 2013). This method indentifies deter-

minants of productivity, economic growth and regional development. Other approaches used by Nevima and Kiszova (2013) are: DEA method for regional efficiency and panel data method. In measuring competitiveness factors, multivariate methods like cluster analysis, factor analysis and principal component analysis are used (Melecky, 2013).

In this research, panel data models are built. This method has many advantages compared to the traditional approach based on linear regression. The panel data models allow a better evaluation of dynamic changes in characteristics and the identification of fixed or random effects in data. The main disadvantage of methods based on the data aggregation is solved by panel models.

In Romania, there are several competitiveness indices: Competitiveness Index for regions that was proposed by IRECSON, Regional Competitiveness Index proposed by the Group of Applied Economics and regional competitiveness indices based on integrator model of Mereuta (Mereuta et al, 2007). The competitiveness analysis offers to government and business environment a strong instrument for assessing the strong and the weak points of the economy.

The neoclassical and endogenous economic growth theories showed the strong connection between economic growth and competitiveness (Pelinescu et al, 2016). Most of the models for competitiveness are based on Solow-Swan model from neoclassical theory. However, this econometric model could be improved by considering other determinants of eco-efficient and sustainable development. The Solow-Swan model considers investment as a source of economic growth, and the investment in technology are recommended in this sense.

Innovation is considered as a main factor of competitiveness that generates economic growth. For American and Western Europe economies, the innovation has a positive impact on economic growth (Howells, 2005). However, we consider the investment in innovation rather risky: higher uncertainty rate and high initial costs. The loss of people implied in research determines the loss of money for their specialization (Paunov, 2012).

There are two methods for promoting an economic growth based on innovation: technological competitiveness based on new products for improving the company performances and place on markets and competitiveness through cost based on an innovation process and replacement of labour force with industrial technology (Bogliacino & Pianta, 2011).

Several European Strategies analyzed the connection between sustainable development and competitiveness for the European Union: the EU Strategy regarding sustainable development, Europe 2020 Strategy and Lisbon Strategy. The international markets open, world globalization and fast technological changes ensure the competitiveness growth and, consequently, a sustainable development. World Bank asked Romania through Economic Memorandum for competitiveness improvement and a fast economic growth to diminish the gap between Romania and developed countries from the EU. The economic growth acceleration improves the life standard and reduces the poverty rate.

There are few studies in literature that used the panel data models to measure the regional competitiveness in connection with economic growth. For example, Nevima (2011) studied the regional competitiveness and productivity in the context of economic growth theory for the EU-15 countries. The non-linear panel was based on 35 regions from the EU-15 countries at NUTS-2 level during 2000-2008. The average of GDP per capita in PPS was used as proxy for

global competitiveness and it was explained by gross capital formation, expenses on research and development and a net disposable income.

35 regions from Visegrad countries (V4) were considered by Nevima and Melecký (2011) to measure regional competitiveness using some panel data models for 2000-2010. Better productivity was observed in several regions (Bratislava, Prague, Nyugat-Dunantul & Kozep-Magyaroszag).

The studies regarding regional competitiveness and economic growth in Romania focused on output per capita and its determinants (Vincze, 2003; Chilian & Iordan, 2008). The results indicated a tendency of increasing the large gap between regions regarding the development level. Innovation as well as research and development are important factor for regional competitiveness that might generate economic growth (Goschin, 2013). Romania still faces a poor regional development because of weak physical infrastructure, a low contribution of economic agents for sustaining the scientific research, a low applicability of research results. Romania makes efforts to design a regional strategy regarding Research & Development. Suitable policies are necessary for regional innovation. The low efficiency of innovation policies in Romania is explained by the lack of any coordination between national and regional policies (Ranga, 2010).

In Romanian' counties the regional competitiveness was measured by using dynamic panel data in the period 2000-2012. The results indicated that the economic growth in the previous year and the average number of employees are factors that improve regional previous and ensure economic growth in the current period (Iordan et al, 2015). Simionescu (2015) used a principal component analysis and panel data models to show that research expenses and development and innovation did not influence the competitiveness in Romania.

In a recent study of Thissen et al. (2016), a geographically weighted regression was proposed to analyze the structural economic growth and the competitiveness of network positions in trade.

An empirical analysis will be made to assess the regional competitiveness in Romania in correlation with the economic growth. Therefore, the other section will include some methodological issues.

3. METHODS, DATA AND VARIABLES

As we stated, the main aim of this paper is to analyze the connection between economic growth and regional competitiveness in Romania using supply side factors. The analysis is based on a quantitative method: panel vector-autoregressive framework, including panel Granger causality test.

The panel data approach solves the problem of small sets of data while the panel VAR model allows the evaluation of effect of innovation in a variable to the other variables in the global system.

In the general approach, a panel vector-autoregressive model has the following form:

$$y_{n,t} = \mu_n + A_n(i) \cdot Y_{n,t-1} + \varepsilon_{n,t}, \quad (1)$$

$y_{n,t} = (y_{1t}, y_{2t}, \ldots, y_{Nt})$ including data for all cross-sections, $n = 1,2,\ldots,N$

$y_{n,t}$ - vector including variables for each cross-section out of N elements

μ_n- cross-section specific intercept

A_n (L)- lag polynomial for model coefficients

$\varepsilon_{n,t}$'- errors of null average and cross-section specific variance σ_n^2

In case of no restrictions, N x k x N coefficients are considered in the matrix A_n.

The coefficients in A_n (L) change randomly across cross-sections under the hypothesis of mean group estimator. The standard coefficient $a_{h,i,j}^p$ in A_n (L) is written as:

$$a_{h,i,j}^p = a_{i,j}^p + \mu_{h,i,j}^p \quad (2)$$

when p is the lag order of the VAR model, $p = 1,2,\ldots,P$

n – cross-section index

$i,j = 1,2,\ldots,K$.

The reduced-form of the VAR model is:

$$y_{n,t} = \mu_n + A_n (L) \cdot y_{n,t} + \varepsilon_{n,t}' \quad (3)$$

In the traditional approach, according to Goodhart and Hofmann (2008), the conections between cross-sections are neglected. The approach of Canova and Ciccarelli (2006) uses the VAR reparametrization to include the cross-sections linkages. Different linear combinations of regressors are used to consider their changes.

If the lagged dependent variables coefficients differ across cross-sections, the standard fixed effect estimator lacks the consistency in dynamic panels. The errors serial correlation is computed using the restrictions on slope coefficients on case of auto-correlated regressors. The issue of serial correlation is not solved by the instrumental variable estimation. Therefore, Pesaran and Smith (1995) considered a panel VAR based on mean group estimator. The coefficients across cross-sections have a consistent estimate of mean effects.

The variables used in this study are: real GDP growth (2005=100), occupation rate, activity rate, unemployment rate and average number of employees. The variables are registered for all the 42 counties of Romania and in the period 2006-2014.

The occupation rate taken from the Balance of labour force represents the weight of civil employed population in the total labour resources:

occupation rate = (civil employed population / labour resources)·100

The activity rate is taken from the Statistical Research on Household Labour Force and it represents the weight of active population of 15 years old and more of the total population in the same age segmentation.

activity rate = (active population (≥15 years) / total population (≥15 years))·100

The unemployment rate is taken from the Statistical Research on Household Labour Force and it represents the weight of unemployed people in the active population.

unemployment rate = (unemployed population / active population)·100

The defined indicators refer to human resources. Romania faces problems regarding competitiveness on the labour force demand. Therefore, we considered this study to evaluate the impact of issues on labour market on the economic growth and consequently on the regional competitiveness. There are high discrepancies between Romanian counties regarding the economic development, but also regarding occupation, activity and unemployment. There are developed counties (Bucharest, Ilfov, Constanta, Cluj, & Bihor) with a lower unemployment rate and higher occupation. On the other hand, there are counties with a high unemployment (Alba, Vaslui, Suceava, Galati, & Teleorman), being characterized also by high poverty and social development. The economic crisis that started in 2009 in Romania accentuated these discrepancies.

4. REGIONAL COMPETITIVENESS AND ECONOMIC GROWTH IN ROMANIA

Considering that Romania's competitiveness is not based on innovation, in this study, we assessed the human resources contribution to a competitive economic growth. Using data series for 42 Romanian counties, including Bucharest, we analyzed the competitiveness from economic growth approach brought by the labour market during 2006-2014.

Romania has an economy based on efficiency factors, but this is not enough compared to other EU states. Besides Bulgaria, other CEE countries (Poland, Hungary, Croatia, Estonia, Latvia, Lithuania) have already made the transition to an economy based on innovation and sophistication.

The Research and Development sector in Romania faces a hidden crisis with negative effects on competitiveness and sustainable development. Therefore, several main directions of actions are required on the short and medium term: the consolidation of system governance, a faster results transfer, a better administration of public research and development sector, the stimulation of demand for private sector mainly by better investments environment based on innovation (Eurostat, 2013). The European Commission recommended: more efficient investments in Research and Development, priorities for getting private investments in this sector, a higher protection of authorship, and a higher commercialization of research results.

Romanian competitiveness is mainly due to the export of products from industry and agriculture. The economy is competitive regarding the labour force price. But there is much vulnerability regarding productivity, efficiency, international investment of Romanian companies and the accession of financing resources. These conclusions are based on the Romania rank in the Global Competitiveness Report 2015-2016, but an econometric evaluation is needed to support these findings and to propose some suitable policy recommendations to ensure a more competitive economy for Romania.

The novelty of this research is related to the econometric approach that allows the assessment of impact of the labour market on the economic growth in the Romanian counties. The panel VAR models have not been used before in literature for this kind of assessment.

In Table 1, the Levin-Lin-Chu (LLC) test is applied for detecting the presence of unit roots in the panel data series for all variables.

Tab. 1 – Levin-Lin-Chu test results

Variable	Test's statistics	p-value
Real GDP rate	-35.43	0.000
Occupation rate	-19.5067	0.000
Activity rate	-8.8889	0.000
Unemployment rate	-16.6329	0.000
Average number of exmployyes	-30.0188	0.000

All data series are stationary at 5% level of significance, according to LLC test. In this case a panel vector-autoregressive (panel VAR) model could be estimated. This model works is based on stationary data. The Granger causality is also tested on stationary data, the results being presented in Table 2.

Tab. 2 – Panel VAR-Granger causality Wald test

Null hypothesis	Chi-square statistic	Prob > chi-square
Real GDP rate does not Granger cause occupation rate	10.936	0.001
Occupation rate does not Granger cause real GDP rate	33.020	0.000
Real GDP rate does not Granger cause occupation rate	33.079	0.000
Occupation rate does not Granger cause Real GDP rate	37.017	0.000
Real GDP rate does not Granger cause unemployment rate	63.710	0.000
Unemployment rate does not Granger cause Real GDP rate	174.491	0.000
Real GDP rate does not Granger cause average number of employees	33.766	0.000
Average number of employees does not Granger cause Real GDP rate	0.544	0.461

The panel VAR Granger causality test indicates that there are bi-directional relationships between the following variables at 5% level of significance: real economic growth and occupation rate, real economic growth and activity rate, real economic growth and unemployment rate. The economic growth is not Granger cause for employment, but the reciprocal is not valid. Contrary to expectations, a larger number of employees does not generate increases in the real GDP rate. An explanation might be low productivity of Romanian employees and the lack of high technology to consolidate the economic growth. The result is contrary to the study of Iordan et al (2014) who explained the GDP growth using the number of employees in Romanian counties during 2000-2012. We suggest more investment in human resources to accelerate the labour productivity through economic growth. On the other hand, high gaps between the counties might explain this result. Many Romanian counties have problems in ensuring a high productivity and their results cannot be counterbalanced by Bucharest-Ilfov region that is known as an engine of economic development in Romania.

Four panel VAR models were built to study the relationship between the real economic growth and some determinants at county level. We only maintained the regressions, for which the coefficients are valid at 5% level of significance.

P1 model:

$$GDP\_rate_{it} = -0.3121 \cdot GDP\_rate_{it-1} - 1.010384 \cdot occupation\_rate_{it-1}$$

P2 model:

$$GDP\_rate_{it} = -0.493984 \cdot GDP\_rate_{it-1} - 1.746461 \cdot activity\_rate_{it-1}$$

$$activity\_rate\__{it} = 0.1005697 \cdot GDP\_rate_{it-1} + 0.2962726 \cdot activity\_rate_{it-1}$$

P3 model:

$$GDP\_rate_{it} = -0.4702623 \cdot GDP\_rate_{it-1} + 1.079592 \cdot unemployment\_rate_{it-1}$$

$$unemployment\_rate_{it} = -0.183832 \cdot GDP\_rate_{it-1} + 0.2888503 \cdot unemployment\_rate_{it-1}$$

P4 model:

$$GDP\_rate_{it} = -0.2910033 \cdot GDP\_rate_{it-1} - 0.0001964 \cdot employees_{it-1}$$

The real GDP rate is correlated with occupation rate, activity rate and unemployment rate, but the type of correlation is not in line with expectations. All panel models indicated that the real GDP rate tended to decrease in the actual period compared to the previous one.

The occupation rate and activity rate had a negative impact on the economic growth. An increase in the occupation rate at regional level by 1 percentage points determined, in average, a decrease in the real GDP rate by almost 1.01 percentage points. On the other hand, an increase in the activity rate at regional level by 1 percentage points determined, in average, a decrease in the real GDP rate by almost 1.75 percentage points. The result is contrary to Iordan et al (2015) who suggested that increases in occupation rate determine economic growth and a higher competitiveness over 2000-2012. There are high discrepancies between counties regarding occupation rate and the economic crisis increased them. Moreover, the decrease in human resources productivity might be a cause for these results. The innovation is not a factor of economic growth in Romania and the results from research and development studies are not applied in order to get a competitive economy (Simionescu, 2015). The unemployment rate was directly correlated with the economic growth. Even if the unemployment rate increases, the real GDP rate grows. An increase in unemployment rate by 1 percentage point ensures an increase in the real GDP rate by almost 1.08 percentage points. The existence of a developed underground market in Romania and the use of remittances by unemployed people do not encourage the employment. The result emphasizes that high unemployment was not the real cause of the decreases in GDP, but the productivity of the employed population. The activity rate and the unemployment have a tendency of increase, according to P2 and P3 models.

Tab. 3 –Eigenvalue stability conditions

Model	Eigenvalue		
	Real	Imaginary	Modulus
P1	-0.1364498	0.155695	0.2070253
P2	-0.0988329	-0.1397594	0.1711743
P3	0.090706	0.2332394	0.2502563
P4	2.538597	0	2.538597

All the eigenvalues lie inside the unit circle. All panel VAR models, besides P4, satisfy stability condition. Therefore, P4 model will be dropped. So, the average number of employees was not relevant in explaining the economic growth at regional level, contrary to the result of Iordan et al (2015) in the period 2000-2012.

In Romania in the past few years, the growth drivers were net export and domestic demand. The recent negative inflation and wage growth in household with the higher income stimulated the private consumption that was influenced by the economic recession. The investments increased slower after the recession. According to European Commission, minimum and the public wages grew and tax cuts were implemented, but this raises the risk of having a fiscal policy that is pro-cyclical. However, we consider that these increases in wages do not have a coverage in productivity which generates a lower regional competitiveness. The low productivity might be also correlated with the emigration process in Romania. The brain drain phenomenon and, in general, high number of emigrants for working purposes leave in the country with lower producitivity that coukd not ensure a sustainable economic development. Moreover, the economic growth in conditions of high unemployment might be also explained in the context of emigration process. There are many unemployed people that use the remittances of the Romanian emigrants. These remittances are mainly used for private consumption and in a very low percent for investment. But, the private consumption stimulates the economic growth of the Romanian economy.

If the results are analyzed from the perspective of regional competitiveness, we can conclude that Romania faces problems for getting a higher competitiveness by the economic growth at country level. In this context, some policy measures should be implemented to have economic development by using the human and physical resources: investment in human capital for getting higher education and specialization, higher wages to improve the labour productivity, investment in infrastructure and innovation. The private environment is not interested in investments in research activities and a group of researchers does not exist in Romania. There is a low proportion of small and medium firms that are engaged in innovative activities.

Fiscal stimuli will countribute to the economic growth, but policy measures related to the supply side of the Romanian economy are still necessary. Moreover, improvements in public administration and business environment are essential. A weak point regarding competitiveness in Romania is the fragile business environment. The economic and financial crisis had a negative impact on financing assembly by markets shrinking, even more severe conditions for taking credits, guarantees devaluation, worse financial positions for small and medium companies. An alternative for improving the business environment might be the instruments of capital market, but the rigid labour market, low research expenses, an unsuitable fiscal and legal framework are constraints for the development of financial instruments.

5. RESULTS' DISCUSSION

The results of the econometric models showed that in the analysed period, the GDP tendency of decrease was stronger than the tendency of increase. After Romania's entrance in the EU in 2007, the economic growth continued to follow a growing trend. The predictions for the next years were quite optimistic; however, since the end of 2008, the GDP started its decline. In my

opinion, the recent crisis was more like a structural crisis determined by domestic causes (the excessive consumption based on a short-run private domestic debt). This structural crisis with low GDP would inevitably come even if the world crisis would not exist. In the context of the recent economic crisis, all the sectors of the national economy had a negative influence on GDP, with the exception agriculture, forestry and hunting, fishing and fish breeding. The lack of a suitable governing plan correlated with the negative effects of the economic crisis in sectors such as construction, industry and services, and net tax on product had a considerable impact on GDP decrease. Since 2011, the private consumption and the government consumption have decreased, having a negative impact on the GDP. Even if the economy recovered and Romania has experienced a high economic growth in the last few years, the negative effects of structural crisis from the previous period were not compensated according to econometric estimations.

The negative impact of occupation rate and activity rate reflected by the estimation results confirmed the issues on Romanian labour market. Even before the economic crisis, Romania had a low employment rate correlated with a persistent long-run unemployment and large occupation in the underground economy. The economic crisis aggravated the issues of the labour market: higher unemployment rate, extension of underground economy, less remittances, higher fiscal burden. Moreover, the decrease in production capacities generated more labour market adjustments consisting in mass layoffs and a higher unemployment rate (7.8% in 2009). Another explanation for the negative impact of occupation and activity rate on the GDP is related to the persistent labour shortages in some sectors because of the skill obsolescence and labour migratory outflows. The higher unemployment with respect to the pre-crisis period influenced the fast growth of the shadow economy and the social inequalities deepened with negative effects on regional competitiveness. Moreover, migration which diminishes the labour productivity and makes the Romanian economy less competitive might be another effect of unemployment.

Other arguments could support the econometric estimations. The annual unemployment rate decreased, arriving to 6.8% in 2014 after the recession period. However, it seems that the skills erosion determined by a high unemployment in the crisis period had negative effects on the labour productivity, generating loss in the national competitiveness. In reality, the unemployment rate might be higher than the official value, because some companies preferred to reduce the activity because of the turnover decrease, but allowed their employees to maintain their contractual relationship. In this context, it is more than likely that this lack of labour resources negatively affected the economic growth more than expected.

Considering these correlations supported by empirical estimations, Romania should focus more on reduction of the number of unemployed people following the Europe 2020 strategy that promotes a sustainable economy based on higher competitiveness and labour productivity. Moreover, lifelong employees training and higher education should be taken into account in order to have competitive personnel on the labour market and to integrate unemployed people in the labour field. Moreover, Romania has an under-funded educational system. Therefore, it is profitable for a competitive economy to invest more in human resource education. These recommendations based on empirical results are in line with recent findings from literature that considered education as a key factor for achieving regional competitiveness (Audretsch et al., 2016; Guerrero et al., 2016).

6. CONCLUSION

In this study, our expectations regarding the regional competitiveness in Romania were confirmed. A low degree of innovation, low labour resources investments and low productivity in Romania did not sustain a competitive economic growth in Romanian counties. The panel VAR approach was used to evaluate the impact of occupation, activity and unemployment on the economic growth. Contrary to economic theory, the increases in occupation and activity rate negatively influenced the real GDP rate while a better economic growth was achieved with higher unemployment rates. A low productivity of human capital as well as the consequences of emigration process, including remittances, might explain these results. Moreover, there are big gaps between counties regarding the economic and social development.

Romania proposed a target of 70% for the occupation rate until 2020, but lower than the EU target. The actual value is lower than the average level in the European Union and some efforts for the indicator improvement are required. Some measures might be related to a better occupation perspective of productivity growth according to European Commission (2012). Other objectives for Romania refer to decrease in structural unemployment, a higher number of skilled people to respond to labour market needs, lifelong learning, higher performance and quality of education system, promotion of social inclusion, poverty control. All these policy measures should improve the issues on the labour market as to achieve economic growth that will make the Romanian economy more competitive.

Our results are in line with recent studies that considered the quality of labour force to be essential to achieve regional competitiveness. In this context, investment in education and training programs are required to have competitive personnel and to achieve the goals for a sustainable development in Romania. Even if the unemployment rate has decreased in the last few years in Romania compared to the recession period, the erosion of labour resources and the awareness of well-qualified personnel were not considered in the governmental strategies.

This study is limited by the use of only some indicators related to labour market. In the future, this empirical study could be extended by including other macroeconomic variables related to social development.

References

1. Annoni, P., & Dijkstra, L. (2013). *EU regional competitiveness index.* Luxembourg, Europe.

2. Annoni, P., & Kozovska, K. (2010). *EU Regional Competitiveness Index: RCI 2010.* EUR-OP.

3. Audretsch, D., Lehmann, E., Meoli, M., & Vismara, S. (Eds.). (2016). *University evolution, entrepreneurial activity and regional competitiveness.* Springer International Publishing.

4. Bogliacino, F., & Pianta, M. (2011). Engines of growth. Innovation and productivity in industry groups. *Structural Change and Economic Dynamics,* 22(1), 41-53., http://dx.doi.org/10.1016/j.strueco.2010.11.002

5. Canova, F., & Ciccarelli, M. (2006). Estimating Multi-Country VAR Models. *European Central Bank Working Paper,* No. 603.

6. Chilian, M.N., & Iordan, M. (2012). *Territorial Economic and Social Gaps in Romania, The Seventh Edition of the International Conference on Theoretical and Applied Economic Practices "Economic Growth in Conditions of Globalization",* Institute of Economy, Finance and Statistics Chişinău, Republica Moldova, 18-19 October 2012.

7. Chilian, M.N., (2011). *Competitivitatea economiei româneşti şi integrarea în Uniunea Europeană.* Editura Universitară: Bucureşti.

8. Danon, M., & Agglomerations, C. (2014). *Constructing a Novel Competitiveness Index for European Regions* (No. 2014-42). Groupe de REcherche en Droit, Economie, Gestion (GREDEG CNRS), University of Nice Sophia Antipolis.

9. European Commission (2012). *Elements for a Common Strategic Framework 2014 to 2020,* SWD (2012) 61 final, Part I, II

10. Eurostat pocketbook (2013). *Science, technology and innovation in Europe,* 2013 edition.

11. Gardiner, A., Martin, R., & Tyler, P. (2004). *Competitiveness, Productivity and Economic Growth across the European Regions*, University of Cambridge, UK.

12. Goodhart, A.E., Hofmann, B. (2008). House Prices, Money, Credit, and the Macroeconomy. *Oxford Review of Economic Policy*, 24, 180-205, http://dx.doi.org/10.1093/oxrep/grn009 .

13. Goschin, Z., (2013), Determinanţii regionali ai investiţiilor pentru C&D si inovare în România. *Studii Şi Cercetări de Calcul Economic Şi Cibernetică Economică*, 1-4/2013.

14. Guerrero, M., Urbano, D., & Fayolle, A. (2016). Entrepreneurial activity and regional competitiveness: evidence from European entrepreneurial universities. *The Journal of Technology Transfer*, 41(1), 105-131, https://doi.org/10.1007/s10961-014-9377-4 .

15. Howells, C. (2005). Innovation and regional economic development: A matter of perspective? *Research Policy*, 34(8), 1220-1234, http://dx.doi.org/10.1016/j.respol.2005.03.014 .

16. Iordan, M., Chilian, M-N., & Simionescu, M. (2014). Determinants of Regional Competitiveness in Romania-A Panel Data Approach. *Management Strategies Journal,* 26(4), 13-20, http://dx.doi.org/10.1016/s2212-5671(15)00274-9 .

17. Martin, R. L. (2003). *A Study on the Factors of Regional Competitiveness. A draft final report for the The European Commission, Directorate General Regional Policy.* Cambridge Econometrics, University of Cambridge, UK.

18. Melecký, L. (2011). Approaches to regional competitiveness evaluation in the Visegrad four countries. *Mathematical Models and Methods in Modern Science,* 184-189.

19. Mereuţă, C., Albu, L.L., Iordan, M., & Chilian, M.N.. (2007). A Model to Evaluate the Regional Competitiveness of the EU Regions. *Romanian Journal of Economic Forecasting,* 3, 81-102.

20. Muntean, M. C., Nistor, C., & Nistor, R. (2009). Competitiveness of Romania's South-East Region in the European Context.

21. Nevima, J. (2011). Application of econometric panel data model for regional competitiveness evaluation of selected EU 15 countries. *Journal of Competitiveness*, 3(4), http://dx.doi.org/10.7441/joc.2012.04.01 .

22. Nevima, J., & Kiszová, Z. (2013). Multiplicative and additive approach in analytic hierarchy process–case study of competitiveness evaluation of Czech and Slovak regions. *International Journal of Mathematical Models and Methods in Applied Sciences*, 7(5), 490-499.

23. Pablo-Romero, M. D. P., Gómez-Calero, P., & Sánchez-Rivas, J. (2016). Tourism, Competitiveness and Economic Growth: A New Analytical Model. *Tourism-from Empirical Research towards Practical Application*, 111.

24. Paunov, C. (2012). The Global crisis and firms' investments in innovation, *Research Policy,* 41, 24 -35, http://dx.doi.org/10.1016/j.respol.2011.07.007 .

25. Pelinescu, E., Iordan, M., Chilian, M-N., & Simionescu, M. (2015), *Competitiveness: Regional competitiveness in Romania*. Universitara Publishing House: Bucharest.

26. Pesaran, M.H., Smith, R. (1995). Estimating Long-Run Relationships from Dynamic Heterogeneous Panels. *Journal of Econometrics,* 68, 79-113, http://dx.doi.org/10.1016/0304-4076(94)01644-f .

27. Petrakos, G., Kallioras, D., & Anagnostou, A. (2011). Regional convergence and growth in Europe: understanding patterns and determinants. *European Urban and Regional Studies,* 18(4), 375–391, http://dx.doi.org/10.1177/0969776411407809 .

28. Pichierri, A. (2013). Cohesion and economic competitiveness Tools for analyzing the European model. *European Journal of Social Theory*, 16(1), 85-100, http://dx.doi.org/10.1177/1368431012449234 .

29. Ranga, M. (2010). Policy Paper on Innovation - Romania, Expert Evaluation Network Delivering Policy Analysis on the Performance of Cohesion Policy 2007-2013.

30. Sheffi, Y. (2013). Logistics-intensive clusters: global competitiveness and regional growth. In *Handbook of Global Logistics* (463-500). Springer New York.

31. Simionescu, M. (2015). The regional competitiveness in Romania. A panel multivariate approach. *Romanian Journal of Economics*, 41(2 (50)), 103-120.

32. Stănculescu, E. (2014). Industrial Innovation in the European Union. *Journal of Global Economics,* 6(4), 36-47.

33. Sujová, A., & Hlaváčková, P. (2015). Sectoral Analysis of Competitiveness of Wood Processing Industry in the Czech Republic. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 63(1), 293-302, http://dx.doi.org/10.11118/actaun201563010293.

34. Thissen, M., Graaff, T., & Oort, F. (2016). Competitive network positions in trade and structural economic growth: A geographically weighted regression analysis for European regions. P*apers in Regional Science,* 95(1), 159-180, 10.1111/pirs.12224.

35. Vincze, M. (2003). *Regional Competitiveness in Romania*. Babeş-Bolyai University, Faculty of Economic Sciences. Cluj Napoca.

36. Webster, C., & Ivanov, S. (2014). Transforming competitiveness into economic benefits: Does tourism stimulate economic growth in more competitive destinations? *Tourism Management,* 40, 137-140, https://doi.org/10.1016/j.tourman.2013.06.003

37. World Economic Forum (2016), *The Global Competitiveness Report 2015-2016*, http://reports.weforum.org/global-competitiveness-report-2015-2016/

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