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Post-crisis Changes in the Sectoral and Occupational Employment Structures of the Romanian Labor Market[1]

Marioara IORDAN, Mihaela-Nona CHILIAN
Institute of Economic Forecasting, Romanian Academy, ROMANIA
miordan@ipe.ro
cnona@ipe.ro

Gabriela CIURARIU
"Gheorghe Asachi" University, Iasi, ROMANIA,
g.ciurariu@yahoo.com

Abstract: *A primary goal of EU integration is convergence of the regional income per capita (and of other significant socio-economic indicators), and hence, how to generate a process of convergence. In this respect, real convergence is connected to the study of long-term economic growth, economic development and the dynamics of complex economic sectors with high economic and social impacts, and also to the supporting/unsporting institutions and economic mechanisms. Also, structural convergence is also an important process for both building up and functioning of the single economic and monetary area and for the development of the Member States and their regions, and studies have found that there is a correlation between structural convergence and income (real) convergence.*
While real and/or structural convergence was studied mostly in terms of GDP per capita, employment and output, less was said about the occupational changes, both overall and by main sectors of activity. In order to fill in such a gap, the paper presents a combined analysis of sectoral and occupational changes in employment in Romania during the post-crisis period (2011-2015), by main sectors of activity and main groups of occupations. The results show, among others, both positive and negative changes in the sectoral and occupational structures of employment on the Romanian labor market, twin processes of occupational and sectoral increased skilling and de-skilling, diffusion of "tertialization" in most of the sectors, accumulation of talent deficits both at the high education level and at the secondary education level.
Keywords: *sectoral convergence, Romanian labor market, occupational structures, employment, labor demand and supply gap*

Introduction

One of the primary goals of EU integration is the *convergence of the regional income per capita* (and of other significant socio-economic indicators), and hence, how to generate a *process of convergence*. In literature, the *economic convergence* refers generally to the process of reducing the economic, development or socio-economic differences of the less developed/emerging countries/regions/territories towards the developed countries, regions or territories. Thus, the *theories of convergence and divergence* examine the reasons for diminishing or increasing the disparities between the rich and the poor regions, and in the case of divergence, explain the persistence of such disparities.

1. The Correlation between Structural Convergence and Income (Real) Convergence

In particular, the *real convergence* approaches are connected to the study of long-term economic growth, economic development and the dynamics of complex economic sectors with high economic and social impacts, and also to the supporting/unsporting institutions and economic mechanisms (market structure, distribution of economic results) [11], [14]. On the political side, real convergence was one of the major objectives of the EU cohesion policy over the period 2007-2013 and it has covered the poorest EU regions, defined as convergence regions. The

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key objective in these regions, eligible for the cohesion policy instruments, was the stimulation of their growth potential to maintain and achieve high growth rates [19].

The process of real convergence of the Member States of the EU and their regions was extensively studied, either in a macroeconomic context or in connection with the concept of *cohesion* (economic, social and territorial) [35], [26], [8], [12], [31], [1]. The results of the empirical studies on convergence in the EU provide mixed evidence: some studies have generally revealed convergence among the EU member states and/or their regions, but the *pattern* and *speed of convergence* were found to vary sharply across different sub-periods and regional subsets (including periods of divergence), with peculiarities for the EU15 countries and the New Member States, and also within these groups of countries [21], [10], [24], [6], [19], [5]. Also, very important was the *uneven impact of the crisis* upon particular countries (and regions) as regards the convergence process; the convergence tendencies of the NMS continued even after the crisis years of 2008 and 2009, while the periphery countries of the EU15 diverged remarkably in that period. [34]

2. Structural Changes in Romania

As regards Romania, key findings of different studies were that, generally, during the pre-accession period a process of economic convergence was registered, while during the post-accession period a divergence/economic differentiation process was noticed, accompanied by growth in the inter and intra-regional disparities, deepened by the economic and financial crisis. Nevertheless, during crisis Romania was among the few countries which have improved real convergence as compared to the EU average. [18]

Though it has deserved less attention, the *structural convergence* is also an important process for both building up and functioning of the single economic and monetary area and for the development of the Member States and their regions. Studies have found that there is a correlation between structural convergence and income (real) convergence, though the findings differ in what regards the strength and direction of such a connection. The concept of *structural convergence/convergence of economic structures,* developed by Wacziarg, has established that structural convergence occurs if convergence in per capita income is accompanied by sectoral convergence.

Different trends of structural convergence in the European industries were revealed by empirical studies, such as the increase in regional industrial concentration of both declining traditional industries and the growing advanced sectors, or the increase in regional specialization in manufacturing. Findings on the NMS revealed a *split performance* between the Capital regions and the regions bordering the EU, which managed to combine a set of positive, structural and geographical initial conditions with market dynamics, and the other regions, which witnessed the collapse of large parts of their industrial bases, drastically cutting local demand and setting real restrictions to efforts and policies of indigenous growth. [20]

Also, in the NMS the patterns of structural change in terms of both output and employment looked very much differentiated, both across time and individual European countries. In general, the structural changes were more pronounced as regards *employment* than as regards *output* (implying large shifts in productivity performance), with broad shifts from agriculture and industry towards services.

Romania was one of the NMS that experienced significant structural changes [13]. The results of empirical studies generally show a *relative alignment of real convergence and structural convergence* within the national economy, but also important differences between regions and/or counties due to the composition of their sectoral structure [25], [11], [16], [15]. With very few exceptions, only the regions/counties with higher levels of development recorded progresses in the post-accession period, both in terms of real convergence and the structural convergence. Also, some regions/counties with higher development levels recorded a faster real convergence, but a slower structural convergence, which could indicate either specific geographic-economic peculiarities or the presence of sectoral structural rigidities.

3. The Methodology of Research

While real and/or structural convergence was studied mostly in terms of *GDP per capita*, *employment* and *output*, less was said about the *occupational changes*, both overall and by main sectors of activity. In order to fill in such a gap, the paper presents a combined analysis of *sectoral* and *occupational changes in employment* in Romania during the post-crisis period (2011-2015, data for October), by main sectors of activity and main groups of occupations, as follows:

- *Main sectors of activity*: A. Agriculture, forestry and fishing, B. Mining and quarrying, C. Manufacturing, D. Production and distribution of electric and thermal power, natural gas, hot water and air

conditioning, E. Water distribution, sanitation, waste management and decontamination activities, F. Constructions, G. Wholesale and retail trade, repairing of auto vehicles and motorcycles, H. Transport and storage, I. Hotels and restaurants, J. Information and communications, K. Finance and insurance activities, L. Real estate, M. Professional, scientific and technical activities, N. Administrative and support service activities, O. Public administration and defense, public social welfare activities, P. Education, Q. Health and social assistance activities, R. Entertainment, cultural and recreational activities, S. Other service activities.

- *Main groups of occupations*: MG1: Members of legislative and executive bodies, high rank civil servants, top managers and officers, MG2: Professionals/Specialists in different areas of activity, MG3: Technicians and other technical specialists, MG4: Clerical staff, MG5: Workers in services, MG6: Qualified workers in agriculture, forestry and fishing, MG7: Qualified workers and alike, MG8: Operators of machinery and equipment, assemblers of machinery and equipment, MG9: Non-qualified workers.

Conclusion

In order to reveal the trends in labor force skills and competences by *educational and managerial levels*, the main groups of occupations were grouped into *leadership jobs* (MG1), *upper education, highly specialized jobs* (MG2), *middle education, mostly services specialized jobs* (MG3, MG4 and MG5, although certain sub-groups of occupations and occupations may require tertiary education - at least bachelor degree or equivalent), *middle education, mostly industrial-agricultural specialized jobs* (MG6, MG7 and MG8, although certain sub-groups of occupations and occupations may require secondary education - high school or vocational school graduation or graduation of post-high school non-tertiary education) and *low education, non-specialized jobs* (MG9).

The *results* are presented in the Appendix. The main findings about the changes occurred during the post-crisis period in the sectoral and occupational employment structures of the Romanian labor market may be summarized as follows:

- Evidence on *sectoral and occupational growth in employment*, across most sectors and occupations, is noticed in sectors A, C, L, M, N, S. Concomitantly, evidence on *sectoral and occupational decline in employment*, across most sectors and occupations, is noticed in sectors D, E, K, O, P, Q.
- Relative growth in *upper education, highly specialized jobs* (in the shares of MG2 employment) was recorded by the sectors: B, C, D, E, J, N, O, Q, S, while, concomitantly, relative decline was recorded by the sectors: A, G, I, K, L, M, P, R.
- Relative growth in the *leadership jobs* (in the shares of MG1 employment) was recorded by most of the sectors of the Romanian economy: A, C, F, G, H, I, L, M, N, R, S. However, a relative decline in the *leadership jobs* was also registered by several sectors: D, K, O, P, Q.
- Relative growth in *middle education, mostly services specialized jobs* (in the shares of MG3, MG4 and MG5 employment) was recorded by the sectors: A, C, E, H, I, L, M, N, P, R, S. At the same time, relative decline in the *middle education, mostly services specialized jobs* was recorded by the sectors: B, D, F, G, J, K, O, Q. Thus, we may say that a process of *increased middle level tertialization* of certain industrial, agricultural and business services sectors may be noticed, while in other industrial, constructions, business and administrative services such a process has slowed down during the post-crisis period.
- Relative growth in the *middle education, mostly industrial-agricultural specialized jobs* (in the shares of MG6, MG7 and MG8 employment) was recorded by the sectors *A*, *C*, G, *H*, *L*, *M*, N, *P*, *Q*, *R*, *S*, while relative decline was recorded by most of the sectors of the Romanian economy: *A*, B, *C*, D, E, F, *H*, I, J, *L*, *M*, O, *P*, *Q*, *R*, *S*. The simultaneous presence of certain sectors (A, C, H, L, M, P, Q, R, S) both in the group of sectors with relative growth and in the group of sectors with relative decline is determined by the heterogeneity of the occupational groups and/or sectors, by the trend towards increased qualification level demanded by the Romanian labor market for the job positions requiring at least secondary education, in all the sectors of the economy, and by the increased shortage of qualified workers and technicians in some agricultural, industrial and services specialized sectors.
- Relative growth in the *low education, non-specialized jobs* (in the shares of MG9 employment) was recorded by the sectors: B, C, F, I, L, M, R, *S*, while relative decline by the sectors: E, G, J, N, O, P, Q, *S*. The simultaneous presence of sector S both in the group of sectors with relative growth and in the group of sectors with relative decline is determined mostly by the occupational and sectoral heterogeneity.
- On the whole, the "winning" sectors, which recorded mostly positive developments across the majority of occupational groups during the post-crisis period were: A. Agriculture, forestry and fishing, C. Manufacturing, N. Administrative and support services activities, R. Entertainment, cultural and recreational activities and S. Other services activities. Reversely, the "losing" sectors, which recorded mostly negative changes across the majority of occupational groups during the post-crisis period were: O. Public administration and defense, public social welfare activities, P. Education, and Q. Health and social assistance activities.

- The "winning" major groups of occupations, which recorded mostly positive developments across the majority of sectors during the post-crisis period were: MG1: Members of legislative and executive bodies, high rank civil servants, top managers and officers, and to a lesser extent MG2: Professionals/Specialists in different areas of activity and MG3: Technicians and other technical specialists. The "losing" major groups of occupations, which recorded mostly negative changes across many sectors were: MG7: Qualified workers and alike, MG8: Operators of machinery and equipment, assemblers of machinery and equipment, and to a lesser extent MG4: Clerical staff. While the move towards increased educational level and professional skilling of occupations is in line both with the domestic and (mostly) international market demand and enhances micro- and macroeconomic, regional and sectoral competitiveness (at least potentially), that towards decline in skilling of occupations requiring secondary educational level is not, being also harmful (potentially) to competitiveness, at all economic, sectoral and territorial levels.
- Such findings align with other studies and international rankings on occupational/talent shortage: among the top positions the Romanian employers found difficult filling in 2016 were skilled trades (rank 1), laborers (rank 2), and production operators/machine operators (rank 4) [23], all pertaining to the above-mentioned "losing" groups of occupations. However, this is a problem that the Romanian labor market is facing for some time and will face it for years to come, especially because of: migration of qualified workers to other countries of the EU (especially), worsening labor market condition for qualified workers and technicians, and sharp decline in both the importance and in the magnitude of vocational and secondary level technical education. On the another side, the "winning" groups of occupations exert additional pressure on the Romanian labor market, and the matching gap between the demand for and supply of highly educated/skilled workforce is increasing fast, requiring political, managerial and economic action from all the actors involved to turn it from threat into an opportunity for further development and growth.

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Appendix
Matrix of sectoral/occupational changes in employment in Romania during the post-crisis period (2011-2015), %

Sector/Occupation group	MG1	MG2	MG3	MG4	MG5	MG6	MG7	MG8	MG9
A. Agriculture, forestry and fishing									
Share in group total	1.2	-0.3	1.6	0.5	0.5	-13.5	1.5	1.6	0.6
Share in sector total	2.7	-7.6	5.0	0.2	1.9	-8.0	3.7	2.7	-0.6
B. Mining and quarrying									
Share in group total	-0.2	0.2	-0.3	-0.1	0.0	0.0	-0.1	-0.5	0.1
Share in sector total	1.4	2.5	-0.6	-0.3	0.5	0.0	0.5	-5.9	1.9
C. Manufacturing									
Share in group total	2.9	2.1	-1.0	1.1	0.4	0.7	5.2	-13.1	4.6
Share in sector total	1.9	1.0	0.4	0.2	0.4	-0.1	1.5	-10.0	4.8
D. Production and distribution of electric and thermal power, natural gas, hot water and air conditioning									

Share in group total	-0.7	0.0	-0.1	-0.4	0.0	0.0	-2.1	-1.3	0.0
Share in sector total	1.1	4.7	8.5	-0.5	0.5	0.0	-7.1	-7.7	0.5
E. Water distribution, sanitation, waste management and decontamination activities									
Share in group total	0.0	0.1	0.1	-0.9	0.1	-0.3	-0.6	-0.4	-1.1
Share in sector total	2.0	1.0	2.4	-2.0	1.2	-0.1	-2.3	-2.3	0.0
F. Constructions									
Share in group total	0.6	0.3	-0.2	-0.3	0.6	1.1	-4.2	0.4	0.4
Share in sector total	2.3	0.3	0.7	-0.2	1.3	0.0	-8.6	-0.1	4.2
G. Wholesale and retail trade, repairing of auto vehicles and motorcycles									
Share in group total	2.3	0.6	-0.1	-3.6	-1.0	0.5	0.6	0.8	-2.2
Share in sector total	2.9	-0.4	1.4	-2.0	-0.4	0.0	0.0	-0.5	-0.9
H. Transport and storage									
Share in group total	2.4	0.4	0.6	10.8	0.1	0.9	-0.5	11.0	0.4
Share in sector total	2.0	-1.2	-0.4	6.1	-1.4	0.0	-6.3	1.7	-0.5
I. Hotels and restaurants									
Share in group total	0.5	-0.1	0.4	0.7	0.2	0.2	-0.1	0.2	0.9
Share in sector total	1.6	-1.6	1.2	0.6	-5.0	0.0	-1.3	0.4	4.0
J. Information and communications									
Share in group total	0.6	3.1	1.5	-0.1	0.0	0.0	0.2	0.0	0.1
Share in sector total	0.5	2.6	1.0	-2.8	-0.6	0.0	-0.2	-0.4	-0.1
K. Finance and insurance activities									
Share in group total	-1.6	0.0	-0.6	-0.8	0.3	0.0	0.0	0.0	0.0
Share in sector total	0.2	-0.8	-1.0	-0.7	2.2	0.0	0.1	0.0	0.1
L. Real estate									
Share in group total	0.6	0.2	0.3	0.2	0.4	0.3	0.1	0.1	0.3
Share in sector total	5.0	-1.2	0.7	-2.5	3.0	-0.2	-4.5	-1.4	1.2
M. Professional, scientific and technical activities									
Share in group total	3.5	3.2	2.2	1.7	0.4	-1.7	0.9	0.2	0.7
Share in sector total	4.9	-4.3	-0.1	0.2	-0.2	-0.8	0.9	-1.5	0.8
N. Administrative and support service activities									
Share in group total	1.9	1.1	1.9	2.0	4.8	4.3	1.4	1.2	-0.6
Share in sector total	2.2	0.7	2.0	0.5	-1.7	-0.1	1.9	0.5	-5.8
O. Public administration and defense, public social welfare activities									

Share in group total	-0.5	-0.2	-2.3	-2.4	-1.9	-0.2	-0.3	-0.2	-1.1
Share in sector total	0.0	5.5	-2.1	-1.5	-0.4	0.0	-0.2	-0.3	-0.9
P. Education									
Share in group total	-5.3	-8.3	6.4	-2.7	1.2	0.8	-0.9	0.3	-2.3
Share in sector total	-2.9	-9.2	10.3	-1.3	4.1	0.0	-0.9	0.7	-0.8
Q. Health and social assistance activities									
Share in group total	-0.6	5.6	-5.4	-0.6	-0.2	0.8	-0.6	0.7	-0.3
Share in sector total	-0.2	9.1	-6.7	-0.7	-0.3	0.0	-1.5	0.6	-0.4
R. Entertainment, cultural and recreational activities									
Share in group total	0.4	0.2	0.6	-0.2	1.2	9.6	-0.1	0.1	0.3
Share in sector total	1.7	-7.8	2.9	-7.1	8.9	2.4	-2.6	0.0	1.5
S. Other services activities									
Share in group total	1.6	3.0	1.4	1.2	2.8	2.5	0.2	0.2	1.0
Share in sector total	1.5	9.6	0.5	-1.2	-1.6	-0.1	-4.7	-1.6	-2.4

Source: Authors' computations, based on data from Tempo-Online database, National Institute for Statistics, Bucharest, Romania.