

## THE IMPACT OF ECONOMIC CRISIS ON REGIONAL DISPARITIES IN ROMANIA. TESTING WILLIAMSON'S HYPOTHESIS IN THE CONTEXT OF ECONOMIC AND FINANCIAL TURMOIL

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**ABSTRACT** – The economic downturn triggered by the economic crisis was installed in Romania in 2008, stopping the economic growth process. However, the impact of the financial turbulence presented asymmetrical effects on regional level, both in terms of GDP per capita and in terms of employment rate. The aim of present article is to analyze how regional economies reacted in this context and to assess the impact of the crisis on intra-regional disparities in Romania. From the methodological point of view, the research involves using panel data analysis tools that can provide evidence amongst the degree to which the crisis has induced a process of economic convergence between regions or increased regional disparities, according to Williamson's hypothesis.

**Keywords:** Williamson hypothesis, intra and interregional disparities, beta and sigma convergence, economic crisis

### INTRODUCTION

The issue of economic disparities in Romania has attracted the attention of researchers both in terms of assessing the causes that have determined economic disparities between regions and of finding solutions that would lead to a balanced spatial development. Dachin and Popa (2011, p. 66) analyzed regional disparities and divergent development paths in terms of labour productivity, level of education and specialization. The authors demonstrated that regional specialization in traditional economic activities (such as agriculture) ensures a high employment rate, but low labour productivity, causing economic disparities in the medium and long term. Also, Marinaș and Socol (2007, pp. 68-70) analyzed the factors that lead to economic agglomerations and emphasized regional divergences in the Romanian economy. The authors set forth a “polycentric” model of development for reducing disparities (development of new centres of economic growth in less developed regions). Goschin *et al.* (2007, pp. 21-24) conducted a statistical analysis of disparities in Romania, using a composite index for multidimensional assessment of regional inequality<sup>2</sup>. The results indicate a high degree of heterogeneity, both at macro-region and intra-regional level.

In addition to empirical studies conducted in the Romanian economy, there is a wide range of scientific papers aimed at assessing the trend of unbalanced development of regions. One of the fundamental theories is Gunnar Myrdal's “circular cumulative causation theory” (1957), according to which market mechanisms are ineffective in correcting economic disparities between regions. This approach contradicts the assumptions of the neoclassical model of economic growth, which supports that the less developed regions tend to record the fastest economic growth rates (based on increasing returns to scale). The difference between the two theoretical visions is that Myrdal introduces two

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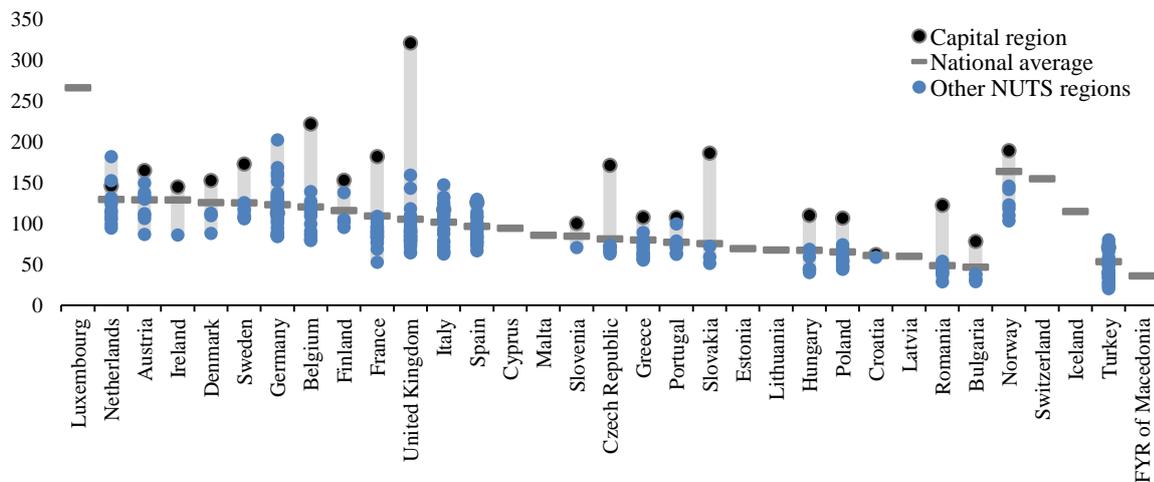
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<sup>2</sup> The composite index of regional disparities is an aggregate indicator that takes into account three variables: GDP, unemployment rate and net nominal wages at county level. Deviation from the national average indicates the degree of economic and social development. This method allows comparison of territorial disparities through a multidimensional index, as it relates to the three variables in a synthesized manner.

economic fundamental processes in his explanatory model: agglomerations and economic flows in terms of capital and labour.

The main causes leading to the formation of economic clusters refer to the initial allocation of each region (climate, natural resources, location, proximity to transport routes, etc.) and the factors that influence the location decision in a particular region of companies or labour. Thus, the agglomeration size is determined by the size of demand, consumer purchasing power and the potential cost reductions in companies or industries arising from proximity to the centre. These assumptions are confirmed by the many examples of “centre-periphery” patterns in Europe. In general, the economic poles (usually the capital cities) are in a privileged position in economic terms compared to the national average.



**Figure 1.** Regional disparities in gross domestic product per inhabitant in Europe (2011, NUTS 2 regions, in purchasing power standard)

Source: Eurostat

J. Williamson<sup>3</sup> tested empirically this theory in 1965. According to his results, development of inter-regional differences in a country tends to be increasing in the first stage of development because of selective labour migration and capital. There is also a tendency of firms to locate in more developed regions due to higher economic returns, R&D expenditure and higher public investment in developed regions, thus forming regional growth poles and exacerbating disparities. However, as diseconomies of scale occur (due to high competition), there is a tendency for inputs to flow to the less developed regions due to lower costs. Another factor that determines economic convergence is the government intervention (policies of redistribution or structural investments in infrastructure). Thus, according to Williamson, economic disparities increase in the first phase and decrease afterwards, tending to economic convergence. This study tests this hypothesis using panel data analysis methods. Béla Szörfi (2007) and Tánzos and Egri (2010) conducted similar studies on EU Member States and on the micro-regions in Hungary.

## METHODOLOGY

From the methodological point of view, this study aims to achieve the research objectives in three logical steps: (1) determine the economic disparities at county level in Romania in the 2000-

<sup>3</sup> Williamson analyzed internal imbalances from 30 states based on cross-sectional data, using GDP per capita as an indicator of economic development.

## THE IMPACT OF ECONOMIC CRISIS ON REGIONAL DISPARITIES IN ROMANIA. TESTING WILLIAMSON'S HYPOTHESIS IN THE CONTEXT OF ECONOMIC AND FINANCIAL TURMOIL

2014 period; (2) estimate the main effects of the economic crisis on regional balance; (3) assess the extent to which Williamson's hypothesis applies to Romania.

To accomplish these objectives, statistical and econometric methods are used on the following macroeconomic indicators: gross domestic product (GDP), employment rate and an aggregate index that synthesizes the average annual percentage changes of these indicators between 2008 and 2010 (to reflect the crisis effects). In addition, quantitative analysis tools were used to examine *beta convergence*<sup>4</sup> (concept that refers to a process in which the poor regions grow faster than the rich ones and, therefore, catch up on them – Philippe Monfort, 2008) or *sigma convergence* (concept that involves reducing income dispersion between countries or regions; higher variation means greater income inequalities).

### REGIONAL ECONOMIC DISPARITIES IN ROMANIA

Judging by the Gini index, Romania is one of the most polarized countries in the European Union, along with Bulgaria, the Baltic and the Mediterranean countries. At the opposite end are countries located in Central and Northern Europe (Figure 2). This pattern is determined by the economic structure, the degree of endowment with natural resources, geographical location and proximity to major markets, the climate, the economic competitiveness but also the historical evolution of these states (Marinaş, 2013, p. 46). In the case of East European countries (including Romania), it is important to note that the economic evolutions which lead to the current regional disparities was mainly imposed on political considerations rather than reasons of economic efficiency. The communist policy has led to mono-industrial regions (such as coal and steel conglomerates), leaving a legacy difficult to overcome for most regions after the collapse of the centralized system. The collapse of the Iron Curtain in the early 90's was a shock to many Eastern European regions because they were suddenly exposed to free market competition for which they were not competitive enough. This meant a need for radical change in economic behaviour when major structural impairments were revealed by the bad economic shape, particularly in regions specialized in heavy industry and agriculture. In contrast, regions with a mix of industries (including light manufacturing) or a higher share of services were more able to cope with the transformational shock. From this perspective, the various legacies of the communist period led to significant regional disparities in East European countries (Romisch, p. 192). Although at the beginning of transition to a market economy the disparities between regions were relatively low, they have increased in terms of income, employment and investment, outlining the so-called "disadvantaged areas"<sup>5</sup>, characterized by difficulty to adapt to new market conditions (Cândea *et al.*, 2006, p. 79).

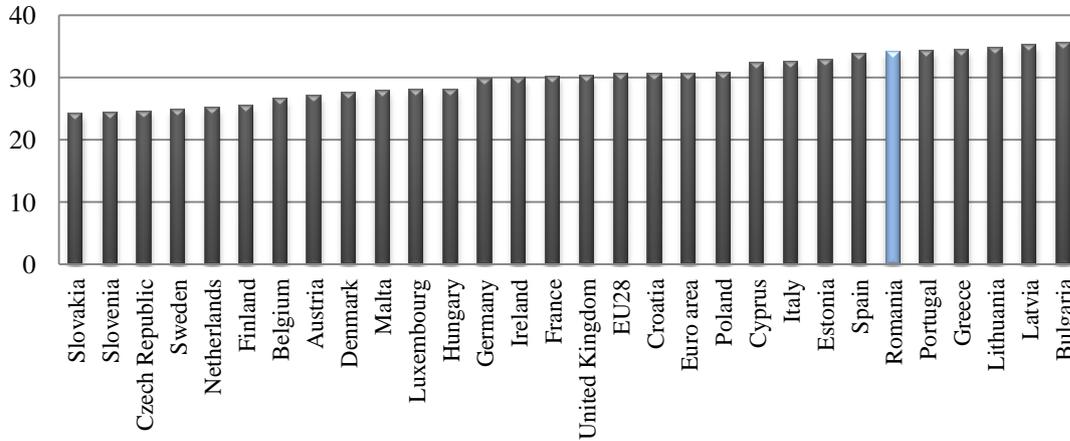
This pattern is maintained at county level in Romania. There are counties, economically dynamic, which recorded a GDP per capita and a higher employment rate compared to the national average. Besides Bucharest-Ilfov, the counties of Timiş, Cluj, Ilfov, Dolj, Argeş are also included in this category (Figure 3). In contrast, there is a large number of counties with a lower GDP per capita and a lower employment rate. The lowest values are found in counties such as Teleorman, Giurgiu, and Vaslui. These imbalances in regional development occurred even before the communist period, due to a different access of industrial activities to mineral and energy resources (they were mainly located in Bucharest, Prahova Valley, Braşov, Jiu Valley, Reşiţa, Brăila, Galaţi, Constanţa). After the forced industrialization, there was a reduction of development disparities between counties due to extensive growth, but the concentration in few large companies (usually in heavy industry, chemical engineering) led to areas depending on a single production unit. The economic restructuring started in Romania after 1990 has seriously affected the workforce employed in industry. The most vulnerable

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<sup>4</sup> The concept of "economic convergence" refers to diminishing the differences between various economic indicators of the countries / regions of a geographical area (Dinu, Socol and Marinaş, 2005, p.15).

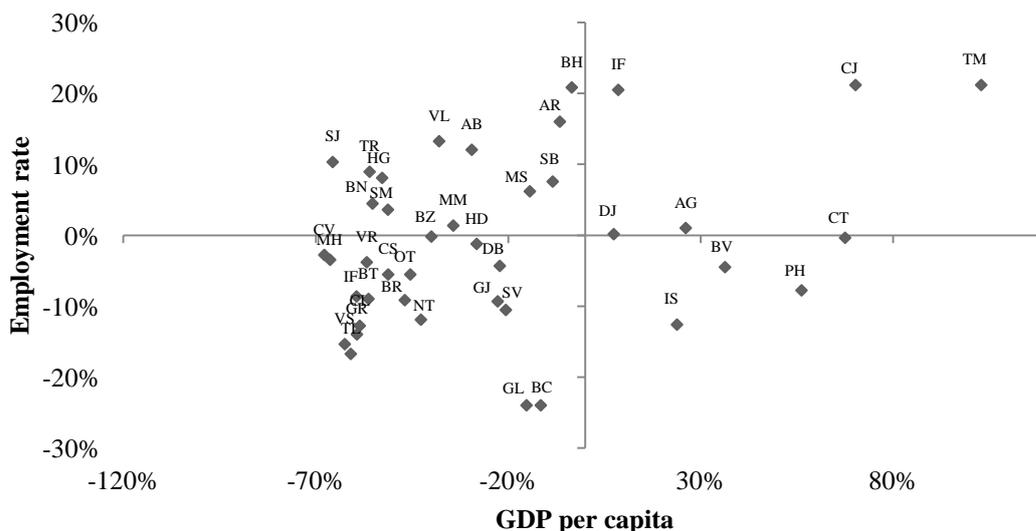
<sup>5</sup> The basis for the designation of disadvantaged areas in these countries represents a combination of demographic trend related to labour market (including unemployment and changes in terms of employment in the industrial sector), income, infrastructure, etc.

were those regions specialized in mining and metallurgy exclusive (employment in the industrial sector decreased by 48% during 1991-1999).



**Figure 2.** Regional economic disparities in European Union (GINI index in 2013)  
Source: Representation and own calculations based on Eurostat data

According to the latest statistics, Bucharest is the only administrative unit (NUTS 3) of Romania with an economic development level comparable to the European average. According to Eurostat regional statistics (2011), the inhabitants of this region have a GDP per capita based on purchasing power of 130% of the European average, followed by Ilfov (80% - 20,100 euro/capita), Timiș (74% - 18,400 euro/capita), Cluj (61% - 15,300 euro/capita) and Constanța (57% - 14,300 euro/capita), while the national average is 42% (10,452 euro/capita). In addition, Bucharest registered a stronger economic position relative to other capital cities/regions in Europe (Rome - 129%; Frankfurt - 129%, Madrid - 126%, or Berlin - 113%).



**Figure 3.** Regional economic disparities in Romania (% compared to the national average, 2011)  
Source: Representation and own calculations based on Eurostat data  
Note: Bucharest was not included in the graphic so that it can be read more easily. Bucharest has a GDP per capita of 9.1 and a high employment rate of 0.4, higher than the national average.

THE IMPACT OF ECONOMIC CRISIS ON REGIONAL DISPARITIES IN ROMANIA. TESTING  
WILLIAMSON'S HYPOTHESIS IN THE CONTEXT OF ECONOMIC AND FINANCIAL TURMOIL

To a significant extent, the main features found in the distribution of output between regions are recorded on the labour market. A high level of GDP per capita is often correlated with a low level of unemployment in this analysis. The main difference that arises is that a relatively low level of GDP per capita does not necessarily coincide with high levels of unemployment. The best example is Nord-Est in Romania. Unemployment is low compared to the national average, but it is also one of the least developed regions in the European Union. This situation can be explained by the fact that in regions with a lower development, the share of agriculture as main employment is higher, absorbing a large number of workers, unlike most industrialized regions, but does not generate a high level of production (Romisch, 2003, p. 192).

Furthermore, economic development in Romania distribution is not uniform between urban and rural areas (Goschin *et al.*, 2007, p. 68). Economic activities are rather concentrated in urban centres, while in rural areas subsistence agriculture predominates. In addition, the consumption in rural areas reflects a low level of well-being (there is a specific demand only for those products which cannot be obtained in their own household - bread, sugar, oil), tobacco, alcoholic products, clothing, and utility payments (Dachin *et al.*, 2007, pp. 42-43). This situation in rural Romania is caused by the lack of conditions compared to urban sites: the service sector is underdeveloped, there is a poor quality infrastructure, in terms of education many young people are forced to abandon high school because of severe poverty. The table below shows the major differences in terms of general living standards between the two areas of residence (Table 1).

**Table 1.** *The differences in development and living standards between urban and rural areas in Romania (2013)*

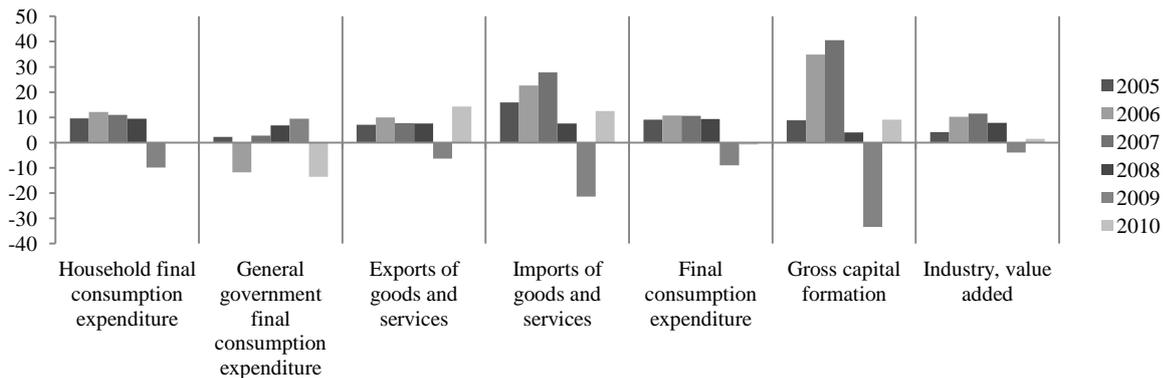
Indicators	Number		Share (%)	
	Urban	Rural	Urban	Rural
Total number of settlements	320	2,861	10.1	89.9
Number of settlements with water distribution network	317	2,050	99.1	71.7
Number of settlements with public sewerage	310	672	96.9	23.5
Number of settlements with natural gas distribution	244	657	76.3	23.0
Number of settlements with thermal energy	86	13	26.9	0.5
Total number of inhabitants	11,665,211	9,601,954	54.9	45.1
Employed population	5,058,007	4,189,391	54.7	45.3
Total average monthly income/person (RON)	1,039.37	722.57	-	-
Maintaining an adequate temperature	-	-	84.5	87.2
Payment of weeks of vacation	-	-	36.2	16.5
Consumption of at least one dish with meat every second day	-	-	80.7	72.3
The share of households that could not perform some expenditures on time	-	-	34.9	39.1
Share of households with access to a computer at home	-	-	69.8	37.8
The share of households having Internet access at home	-	-	68.3	32.8
Distribution of active newly created enterprises	-	-	77.5	22.5

Source: Own calculations based on National Institute of Statistics

**THE ROLE OF ECONOMIC CRISIS IN REGIONAL DISPARITIES IN ROMANIA**

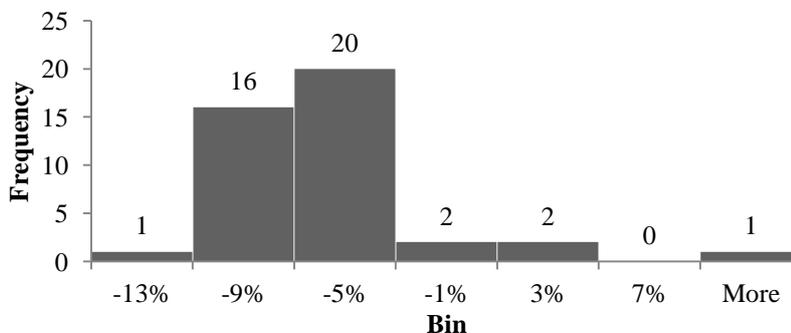
What started in 2007 as turmoil on the sub-prime financial market in the USA has escalated into an economic crisis that had disastrous effects even in countries with a limited level of sophistication of the financial sector. This was the most intense economic crisis since the Great Depression of 1929 and the first to affect so many countries simultaneously worldwide through international network of trade and other transmission channels.

The East European countries, including Romania, were not avoided by the turmoil of the crisis. Various effects nationwide appeared and depended on a number of country-specific variables: the degree of integration in foreign markets, business cycle synchronization, the share of exports in GDP, penetration of foreign banks in the local financial system, etc. Overall, the crisis had a significant effect in the Romanian economy, in terms of decreases in private domestic consumption, decline in government investment and increase in unemployment rate. All these effects have led to a deep recession in the region.



**Figure 4.** *Effects of the economic crisis in the Romanian economy (annual % growth)*  
 Source: Own calculation based on Eurostat data

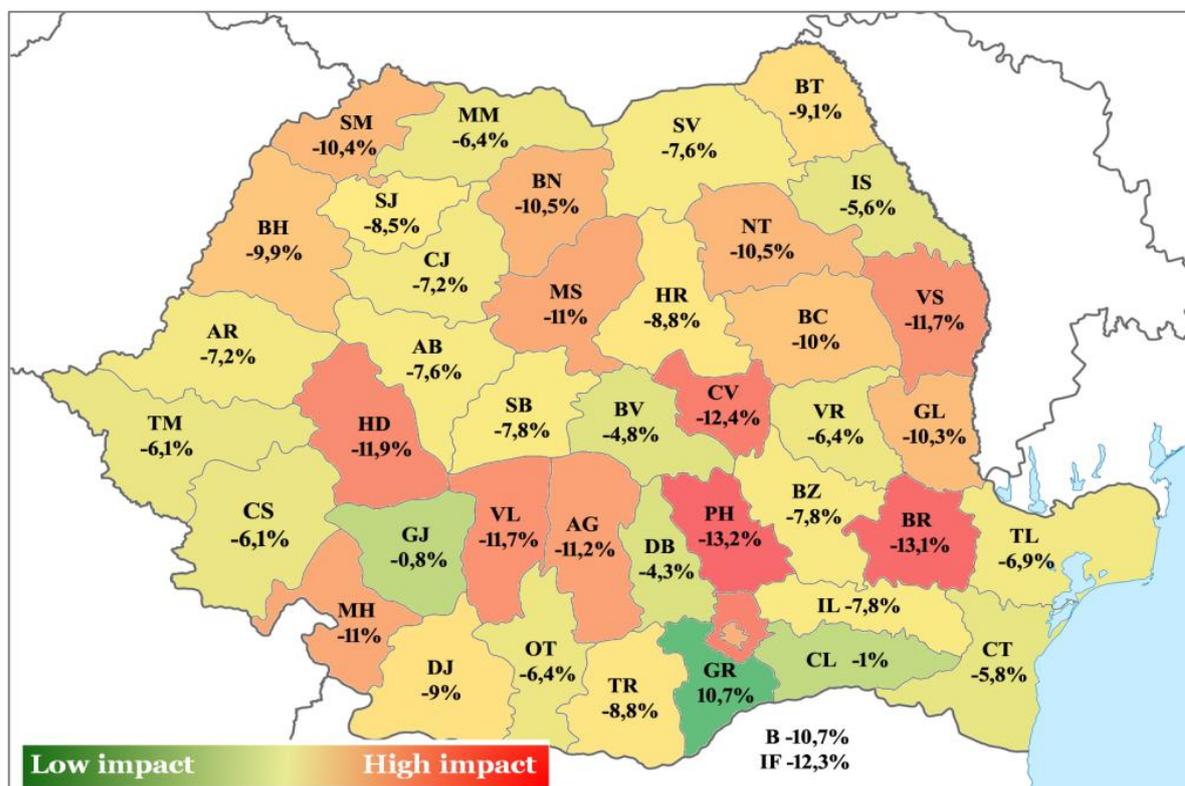
But the crisis had an asymmetrical impact at county level as the histogram (Figure 5) and the choropleth map show (Figure 6). This situation was mainly because of the different exposure of counties to the contagion effect (degree of trade integration with the external markets, budgeted imbalances, capital dependency) and of the regional resilience, such as the ability to innovate and adapt to shocks (structural diversification or specialization, human capital and skill, innovation efforts) (Crescenzi, 2009; Rodríguez-Pose and Crescenzi, 2008). Moreover, Goschin argues that „[...] usually the crisis induces a higher vulnerability of the most developed counties, which are much closer to the world economy’s evolution and, thus, more exposed to the crisis shocks. Within this category the profile of the most crisis vulnerable counties can be described as follows: a mono-product based industrial development, predominantly export-oriented, industrial firms re-located from Western Europe (e.g. Lohn-type production), big investment projects of multinational firms, large industrial parks etc. At the opposite pole are situated the predominantly agricultural counties, of a traditional economy, located in South and East of Romania. The experts estimate that these counties, with a high share of rural population will suffer less than the developed ones as a result of their subsistence agriculture, where the crisis influence is very low”.



**Figure 5.** *Impact of the crisis histogram at county level (combined average of change in GDP and employment between 2008 and 2010)*  
 Source: Own calculation and representation based on Eurostat data

THE IMPACT OF ECONOMIC CRISIS ON REGIONAL DISPARITIES IN ROMANIA. TESTING WILLIAMSON'S HYPOTHESIS IN THE CONTEXT OF ECONOMIC AND FINANCIAL TURMOIL

The index proposed by the author, that combines the average change in GDP and employment between 2008 and 2010, reveals where the economic activities suffered the most in the aftermath of the crisis, in terms of production and labour. The most affected counties were Prahova, Brăila, Covasna, Ilfov, Hunedoara, Vaslui, and Vâlcea. In contrast, there were cases in which the economic crisis has had limited (Gorj or Călărași) or even zero impact (Giurgiu managed to gain economic growth between 2008 and 2010).



**Figure 6.** Impact of crisis at NUTS 3 level  
(combined average of change in GDP and employment between 2008 and 2010)  
Source: Own calculation and representation based on Eurostat data

Given the high heterogeneity of the regional economies, the econometrical models applied could not find any evidence of strong correlations or a general pattern between the dynamics of employment or production and the economic specialization of every county. Instead, there was found evidence that suggests that the export-dependent counties are more likely to be specialized in the industry sector (Table 2). This is the case of Argeș (an important cluster of competitiveness in the auto industry), Bihor, Arad, and Timiș (local industries oriented towards western markets).

**Table 2.** Coefficient of correlation between the share of exports in GDP and the location quotient (LQ)<sup>6</sup>

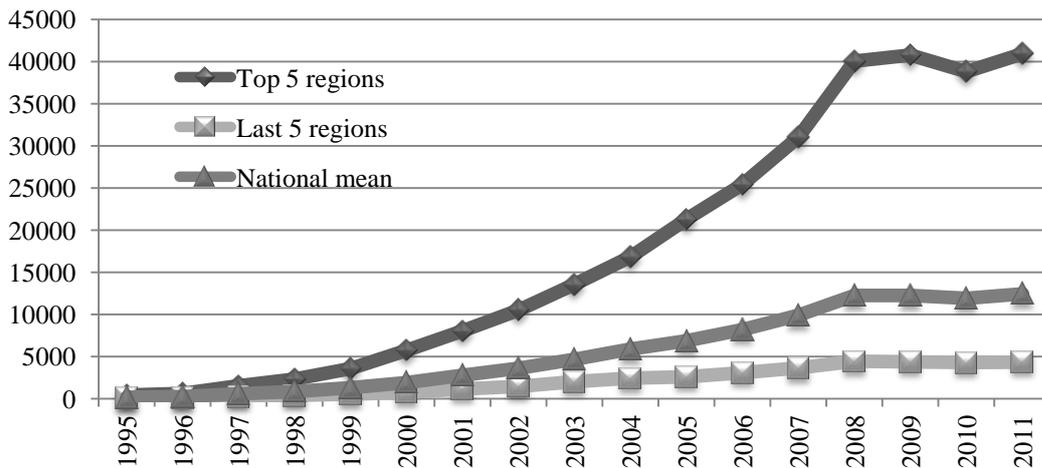
	Agriculture	Industry	Constructions	Services
Share of exports in GDP	-0.34530612	0.531804294	0.07537	0.12456
Economic openness <sup>7</sup>	-0.50045049	0.516904551	0.16541	0.33021

Source: Own calculation based on National Institute of Statistics data

<sup>6</sup> The Location Quotient (LQ) is a way to measure the specialization of a region/county in a specific economic sector. Values higher than 1.0 indicate that the level of regional/county specialization is bigger than the national average (Dachin, 2015, p. 56).

<sup>7</sup> Computed as the ratio of counties trade (sum of exports plus imports) to the counties gross domestic product.

Another transmitting channel was represented by the share of foreign direct investment at county level. Capital flows in the banking sector provided strong incentive for regional integration on the financial markets worldwide, which helped reduce interest rate and increase liquidity. However, the financial integration encouraged in some cases speculative booms (especially in the constructions and real-estate sector), or over-borrowing, especially in foreign currency (this is reflected in the high share of non-performing loans that erupted post-crisis), which increased the vulnerability of the region. According to the Romanian National Bank data, foreign direct investment in the period 2000-2007 was distributed mainly in Bucharest-Ilfov region. Present data suggests that about 65% of the stock of FDI is concentrated in this region.



**Figure 7.** Evolution of GDP average (million euro)

Source: Own calculation based on Eurostat data

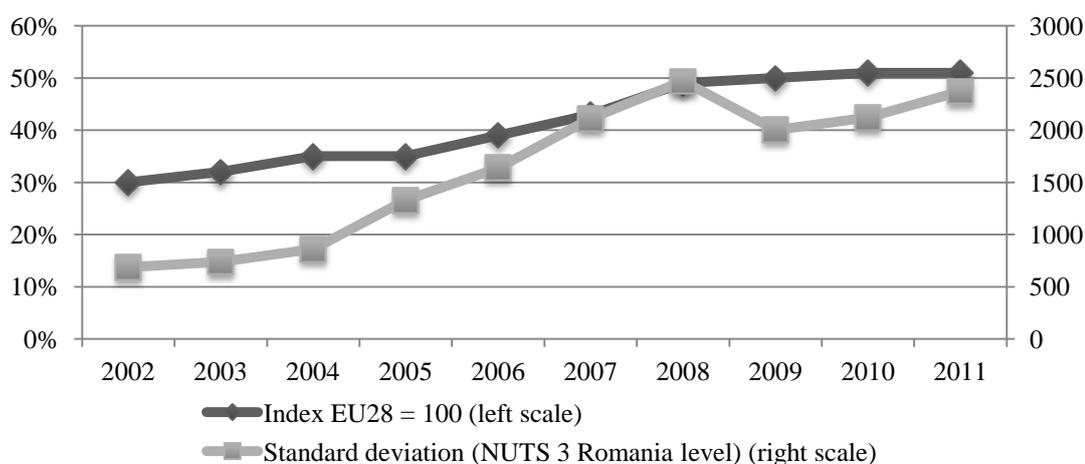
But the magnitude of the crisis at regional level can be revealed by the separation of the top 5 from the last 5 counties. According to the analysis, the negative effects of the economic crisis were felt mostly by the top 5 counties in terms of production: Bucharest, Timiș, Constanța, Cluj, and Prahova. The reason why the impact was greater in those counties is because their economic structure is characterized by a higher exposure to external demand and financial market shocks. Moreover, these counties were the main beneficiaries of foreign capital in the pre-crisis period, flow that stopped sharply with the outburst of financial market problems. Even so, these counties are more prepared to recover from the recession given their economic potential. Another advantage of these economies is the higher linkage to the external markets, which can result in new sources of economic growth once the international demand recovers.

On the other hand, the crisis had only a marginal effect on the less developed counties because of their structural characteristics (usually characterized by low productivity or/and small and medium towns traversing a process of industrial restructuring). Although the financial crisis did not affect the less developed regions through the usual channels of transmission (exports, foreign direct investment, remittances, etc.), these regions have suffered from reduced public spending on infrastructure due to austerity plans and the restructuring of transfers oriented towards reducing income differences between regions.

From the perspective of economic disparities, the economic crisis stopped briefly the perpetuation of disparities. The problem is that the less developed regions have recorded a higher growth rate compared to the developed ones, but ultimately they have a significant economic decline. Therefore, this affected the national economic growth rate and the catch-up process with the EU average, because many of the sources that support this process were concentrated in developed regions.

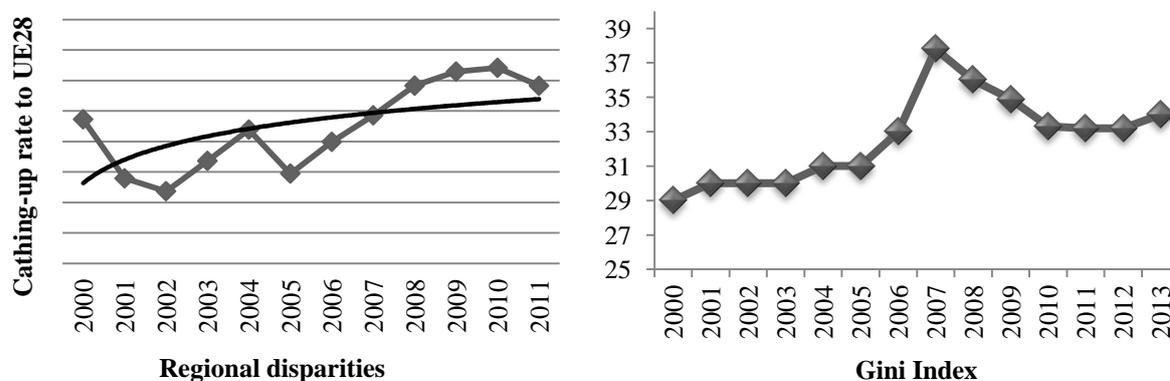
THE IMPACT OF ECONOMIC CRISIS ON REGIONAL DISPARITIES IN ROMANIA. TESTING WILLIAMSON'S HYPOTHESIS IN THE CONTEXT OF ECONOMIC AND FINANCIAL TURMOIL

Between 2000 and 2008, the national average of Romania in terms of GDP per capita got close to the European average, but regional income disparities increased in this period. After the outburst of the crisis, disparities fell, but subsequently increased. The major differences of development that persisted during 2000-2008 indicate that not all social groups and not all regions benefited equally from the economic growth during the economic boom. For example, income differences between self-employed in agriculture and the urban workers decreased only in very good crop years. Most farmers in Romania (especially those located in less developed counties) are not prepared to develop market-oriented production units, independent of weather conditions and with adequate agricultural infrastructure. In these conditions, the income of people employed in this uncompetitive agriculture will continue to be low in relation to other social groups, which may limit the efforts of cohesion policy in Romania.



**Figure 8.** Evolution of national catching-up process and intra-national disparities  
Source: Own calculation based on Eurostat data

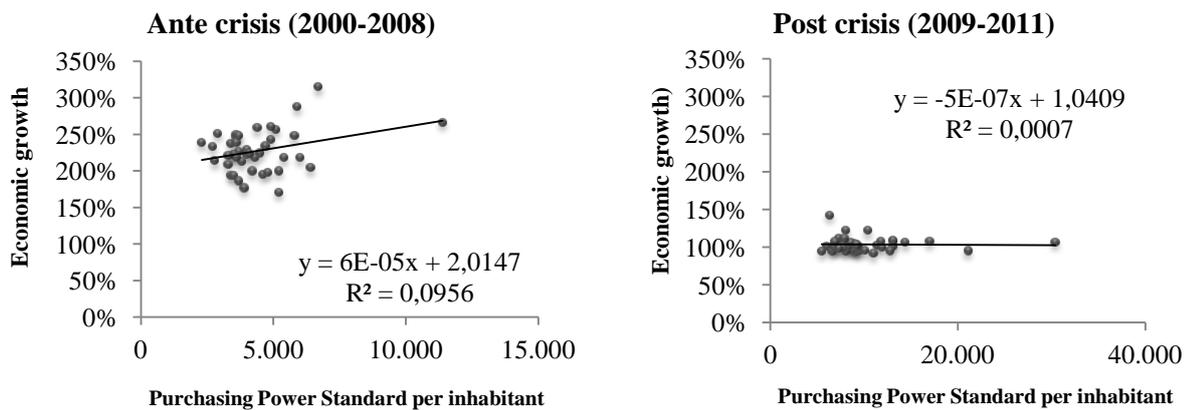
Research has also provided significant results. Until the outbreak of the economic crisis, there was a strong process of national convergence and regional divergence. This situation is known in the specialized literature as “the paradox of convergence” that expresses the situation where a particular country is approaching a certain benchmark (in this case, the GDP per capita of Romania calculated at purchasing power parity compared to the European Union average), yet the economic disparities at intra-regional level increase.



**Figure 9.** The effects of the economic crisis revealed by Williamson's curve and the Gini index in Romania

Source: Own calculation based on Eurostat data

The research also confirms Williamson’s hypothesis according to which the agglomeration activities in a region generate a competitiveness pole stimulating national economic growth but also increasing inequalities between regions. The lack of barriers to free movement of goods, services and factors of production leads to strong regional growth poles, which cause imbalances between countries/regions in terms of income per capita because they absorb increasing amounts of capital and skilled labour from less developed countries and regions (Iancu, 2008, p. 9). Data analysis reveals that Bucharest-Ilfov region distances itself from the rest of Romania, which leads to a “centre-periphery” polarization, but also to a higher national growth rate.



**Figure 10.** Evolution of beta convergence at NUTS 3 in Romania

Source: Own calculation based on Eurostat data

Williamson’s hypothesis is confirmed also by the beta convergence<sup>8</sup> analysis. The usefulness of this indicator is that it can reveal information about the catching-up process of less developed regions with the developed ones. However, this hypothetical situation did not materialize during the analyzed period. According to the results, in the pre-crisis period (2000-2007), there was a process of beta divergence as well as sigma divergence (Figure 5). With the outbreak of the economic crisis, the divergence process flattened amid economic downturn in more developed counties.

## CONCLUSIONS

Currently, the economic gaps in Romania are characterized by four patterns: (1) “centre-periphery” polarized development: major economic poles - underdeveloped and unproductive counties; (2) major discrepancies between urban and rural areas in terms of standard of living and level of economic development; (3) competitiveness differences between counties in the east and west of the country (west economies are more competitive on the international market); (4) a fourth dimension consists in the structural gaps and competitiveness. Research has revealed that counties specialized in industry tend to be more competitive abroad versus counties specialized in agriculture. This differentiation induces significant differences in inter-regional income.

In the context of the economic crisis, the statistical analysis reveals that, at county level, economic disparities persist after the crisis and are striking, both in terms of employment and of production per capita. The economic crisis triggered in 2007 had a temporary effect on reducing disparities within the country borders: it had an asymmetric impact, with a stronger negative impact on

<sup>8</sup> To test the beta convergence hypothesis for the group consisting of the 42 counties of Romania, the author used the regression equation proposed by Sala-i-Martin (1995):  $1) \ln(\Delta GDP_{i,t}) = \alpha + \beta \cdot \ln(GDP_{i,t-1}) + \varepsilon_i$  where:  $\alpha$ ,  $\beta$  and  $\Delta$  are the parameters to be estimated;  $GDP_{i,t}$  and  $GDP_{i,t-1}$  represent the level and the growth rate of GDP per capita in region  $i$  at time  $t$ ;  $\varepsilon$  is the standard error term.

## THE IMPACT OF ECONOMIC CRISIS ON REGIONAL DISPARITIES IN ROMANIA. TESTING WILLIAMSON'S HYPOTHESIS IN THE CONTEXT OF ECONOMIC AND FINANCIAL TURMOIL

the most developed counties. In the same time, by affecting the main growth poles, the catching-up process of Romania with the European Union average was significantly slowed down.

Regional economic development confirms empirically Williamson's hypothesis for Romania, according to which intra-regional economic disparities tend to raise amid strong growth poles that support national economic growth rate. Thus, in the analyzed period (2000-2011) a "paradox of convergence" (national convergence and regional divergence) was recorded.

### ACKNOWLEDGEMENT

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