THE IMPACT OF THE ECONOMIC CRISIS ON THE REGIONAL DISPARITIES OF EARNINGS IN ROMANIA

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Abstract:

After eight years since acquiring the status of EU member state, Romania is still registering high disparities regarding the regional development, even if over the past years the funding from the European Regional Development Fund has started to be significant. The inter- and intraregional disparities are seen both in terms of aggregate economic results, and in respect of infrastructure, territorial distribution and the business enterprise system, the urban/ rural relation, the conditions of living and especially the population's income level. Unfortunately, the ambitious projects for reducing the regional disparities inspired by the policy in the field of EU have been suppressed quickly by the world economic crisis. This being said, the authors aim at analysing the earnings disparities on regional level in Romania, respectively the impact the economic crisis has had over the dynamic of these disparities. Thus, we have attempted to identify the factors to have influenced the earnings and the earning inequalities. For the econometric analysis, we decided to assess a data panel at the level of development regions. The independent variables to have entered the pattern were the gross added value, foreign direct investments, the post-graduate and higher education graduates and the inflation rate.

1. INTRODUCTION

The inter-regional, but also intra-regional disparities are determined most of the times by the occurrence of concentrations (urban agglomerations), favoured both by the external elements (globalization, integration), and internal elements (enhancement/ development poles, investments, clusterizations, etc.). Most frequently, these disparities are noticed in the level of earnings and implicitly, the standard of living.

The issue with earnings inequalities on regional level is an underlying objective of regional policies promoted by the European Union (EU); this is clear from the fact that more than a third of the EU budget goes to the cohesion policy which purpose is to reduce the economic, social and regional disparities. Thus, the reduction of wage inequalities is important especially in terms of the fact that they are, most of the times, under the type of social and economic deprivations, such as precarious conditions of living, scarce access or even lack of education and health, unemployment, etc.

The regional development policies aim both to reduce the disparities between regions, and the disparities within the regions for creating functional and integrated regional markets and by using all these regional resources so as to enhance the attractiveness degree, especially in terms of investments.

The specialized literature comprises many empirical studies to have analysed the issue with the earnings disparities regionally and to have attempted to identify the determining factors. Thus, among the most important factors there is globalization, innovation/development, trade, services sector's development, education, increasing the women's participation on the labour force market, etc. There are studies which take account of a series of institutional factors aiming especially the labour market, such as the reduction of trade unions, minimum wage and unemployment benefits (Monastiriotis, 2002).

Analyses carried out for China's economy have identified as main determining factors of the inter-regional inequalities: the GDP level per capita, the industry share in the region's economy, the unequal accumulation of investments and the degree of urbanization (Candelaria et al., 2013).

With regard to the economic growth's influence over the earnings inequalities, there are studies showing a positive impact, in the meaning of correlation of macroeconomic results/labour productivity rate with the earnings level (Bartik, 1994), but also studies supporting the existence of a negative impact, in terms of the fact that an economic growth is associated with the creation of new workplaces and lower earnings, especially for poorly qualified individuals. (Majumdar and Partridge, 2009).

There are studies to have identified the foreign direct investments as one of the causes of earnings inequalities. Thus, even if most of the times foreign direct investments are the engine of the economic development and implicitly, of revenue increase, it appears that there are also workers who are less-favoured by these, especially since foreign direct investments can require specific competencies and higher qualifications and can focus only on certain economic sectors. (Te Velde, 2003).

Education influences earnings disparities especially in terms of professional competencies and qualifications, all the more that those with a higher education level will be drawn to the more developed regions, which also have more numerous university establishments and which provide more opportunities for employment and better-paid jobs. (Bugudui, 2015).

At the European Union level, the economic and social disparities indicate obvious gaps of development between regions. The biggest problems are in the countries whose GDP per capita is below the EU average and where even the regions deemed as more developed do not exceed the EU average at the level of the main macroeconomic indicators (GDP, investments, employment, etc.). Romania is in a similar circumstance, so an analysis of earnings disparities at regional level, which would capture the impact of the economic crisis as well, would be useful, especially to identify the main factors which can assist in complying with the regional convergence criteria.

2. STATISTICAL ANALYSIS

Having regard to the fact that regional disparities are the result of a several factors, such as geographical position, population structure and density and especially the existence of a poor economic and social systems, then the policies promoted on regional level should focus mainly on the more effective capitalization of every region's potential, so as to improve the standard of living of every citizen. The progress made following the application of the regional development policies is measured using a series of specific indicators, such as: GDP level and implicitly of the gross added value (GVA), foreign direct investments (FDI), the level of the earnings, education level/school abandonment reduction, etc. definitive indicators for reducing the revenue disparities between regions.

Considering these aspects, in this section we have analysed the evolution of some regional indicators like earnings, gross added value, foreign direct investments, number of postgraduate and higher education graduates and the Gini index of earnings disparities. We chose for representation only 4 years: 2000, 2007, 2009 and 2013 to easier capture the impact of the economic crisis on these indicators as well.
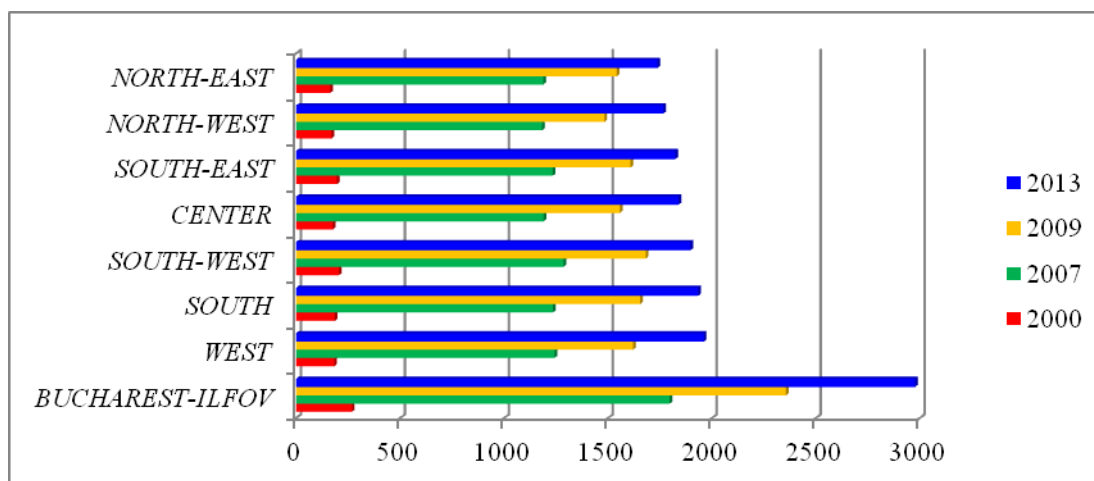
Figure 1. The real gross average monthly earnings (lei)
Source: Own elaboration using data from www.insse.ro

Over the entire period researched, the real gross average monthly earnings increased in all the development regions. The most significant earnings increases were registered during the period 2000-2007, a period considered to be of economic ascent. The regions to have reported the highest increases over this time interval (over 500%) were: North-East, North-West, West and Center. The economic crisis period has not affected the earnings in the meaning of their decrease, but it held back the growth rhythm. Thus, over the period 2007- 2009 the earnings average increase rate for the eight regions was 30%. This increase took place even if 2009 was the year when earnings of employees in the public sector were reduced by 25%. In the time interval 2009-2013, the average increase rhythm of regional earnings was more reduced, only 17%. We ca note that, at the level of 2013, the highest earnings are registered in the regions Bucharest- Ilfov, West and South, regions succeeding to entice the most foreign direct investments also (figure 1).
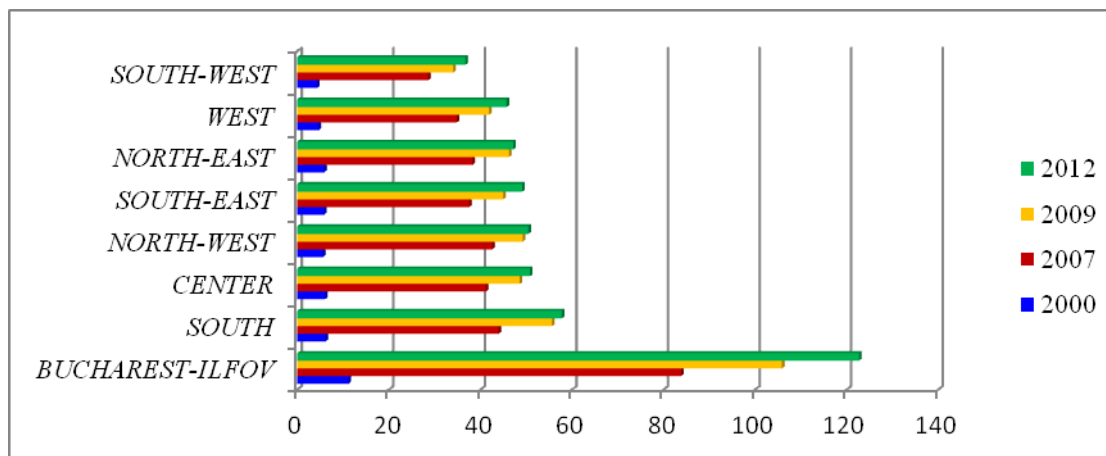

Figure 2. Real gross value added (billion lei)
Source: Own elaboration using data from www.eurostat.eu

During the period 2000-2007, gross added value increased substantially in all the developed regions. The economic crisis made it that in 2009, as compared with 2007, the average increase of the gross added value in the development regions level was 20,7%, and in 2012, as compared with 2009, only 6,8%. Over these two periods the lowest increases were registered in the Center region (17,8% in 2009 as compared with 2007, respectively 4,6% in 2012 as compared with 2009), and the highest were in Bucharest – Ilfov region (26,3% in 2009 as compared with 2007, respectively 15,8% in 2012 as compared with 2009). The economic crisis effects have led to a decrease in the increase rhythm of the gross added value on regional level, situation also reflected in the earnings evolution (figure 2).
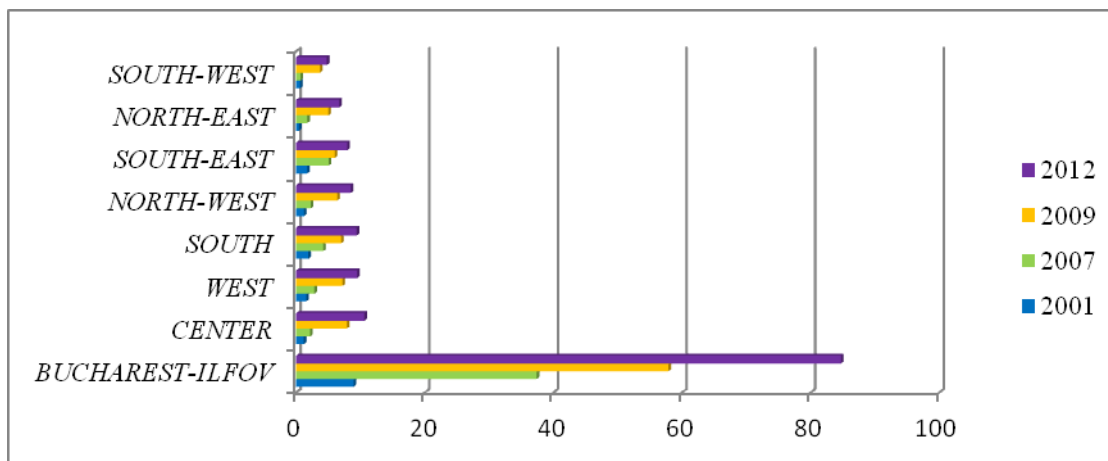
Figure 3. Foreign direct investments (billion lei)
Source: Own elaboration and calculations using data from www.onrc.ro

Foreign direct investments (FDI) increased during the period studied (2001-2012). The highest foreign capital inflows occurred during the period 2001-2007, but we can notice that during the economic crisis as well the foreign direct investments registered an increase too. Except for the Bucharest- Ilfov region, which succeeded to attract almost 60%, among the FDI, the most attractive regions for investors seem to be Center (10,61 billion lei attracted in 2012), West (9,49 billion lei attracted in 2012) and South (9,41 billion lei attracted in 2012). The foreign direct investments support the economic recovery, but at the same time, can exacerbate the earnings disparities by the fact that the level of earnings in the foreign capital enterprises are generally above the national average (figure 3).
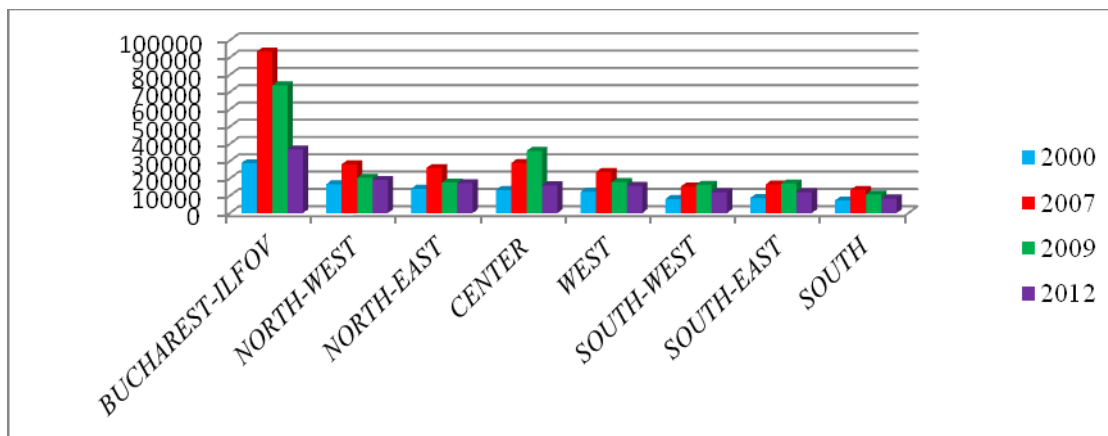

Figure 4. Graduates of post-secondary and tertiary education
Source: Own elaboration using data from www.insse.ro

With regard to the number of postgraduate and higher education graduates, it grew significantly in most regions until 2007, and then a decrease followed. The regions: Center, South-West and South-East are an exception to this tendency, registering in 2009 as compared with 2007 a higher number of postgraduate and higher education graduates (figure 4). The increase in the number of postgraduate and higher education graduates in the period 2000-2007 can be explained also by the massive entry on the market of private universities, but especially by the increased number of high school graduates to have been awarded a diploma (bachelor's degree). The decrease registered in the period 2007-2012 is due, on the one side, to the birthrate's reduction (we are taking into account the generations after 1990) and to the failure to pass the baccalaureate exam, but on the other side, it is possible that the economic crisis effects may have discouraged them to continue their studies.
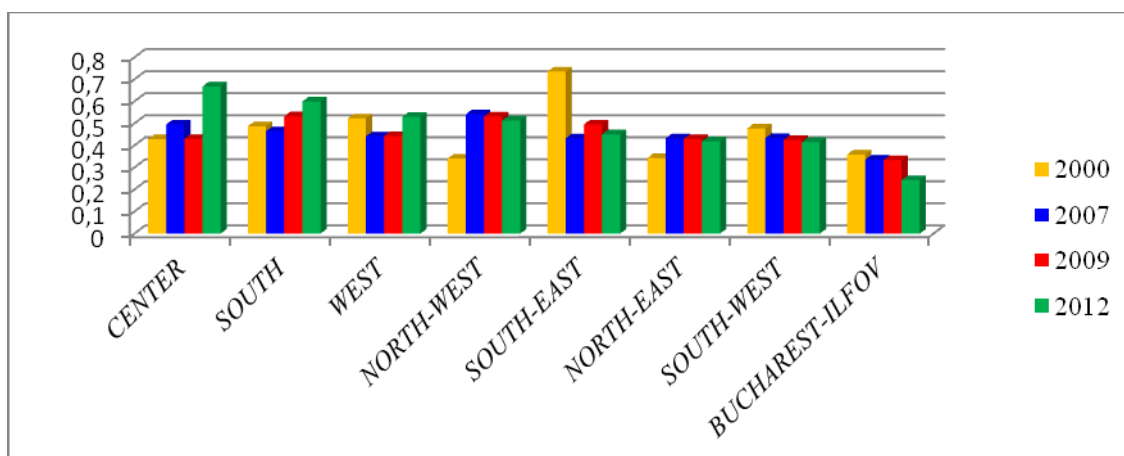
Figure 5. Gini Index
Source: Own elaboration and calculations using data from www.insse.ro

In the years 2000 and 2007 the Gini index of earnings on regional level was in most regions at values under 0,5, which place our country in the left area of Kuznets curve, where is a low level of GDP per capita and small differences between revenue. An exception from this trend was the South- East region with a Gini index of 0,7 in the year 2000, which indicates a higher polarity of earnings. In the year 2009 (peak year for the economic crisis) as opposed to 2007, we notice that the earnings inequalities have slightly decreased in six out of the eight development regions (figure 5). The two regions to have registered an increase of the Gini index were South- East and South. It is to be noted that in 2012, as compared with 2009, the earnings inequalities did not exacerbate in most development regions. The only regions to have registered increases of the Gini index over this period were Center (significant increase of 55% of the index in 2012 as compared to 2009), West (19% increase) and South (12% increase). As expected, the Bucharest- Ilfov region, in all the four years analysed has the lowest values of the Gini index, a fact indicating the existence of a more even distribution of earnings in this region.

Following the Gini index's progress on regional level, we can say that in most development regions the economic crisis effects did not exacerbate the inequalities on earnings level; however, we notice there is a tendency for the earnings inequality to begin to increase at the first signs of economic recovery.

3. ECONOMETRIC ANALYSIS

Within the econometric analysis carried out at the 8 development regions in Romania, we have used annual data for the period 2001-2012. The period chosen for study has been determined by the unavailability of the more recent data on regional level, but regardless of this circumstance, we have managed to surprise the peak period of the economic crisis.

The assessments were made based upon a data panel which had as dependent variables the nominal gross average monthly earnings and the Gini index on region level. Regarding the independent variables, although initially we have considered a higher number, upon the estimations, we realized that the earnings level is influenced by the gross added value (GVA), postgraduate and higher education graduates and the inflation rate at national level (there are not price indexes calculated regionally), while the earnings inequalities (Gini index) are determined especially by the gross added value level and the foreign direct investments at regional level (FDI).

The data sources used were the National Institute of Statistics from where we took the data for the earnings, the postgraduate and higher education graduates and inflation rate, Eurostat for the gross added value and the Trade Register National Office for foreign direct investments.

Concerning to the Gini index calculated for every region separately, we took into account the earnings on component county level. The main purpose of this index's carry out was to

determine the earnings inequalities at region level, because the Gini index measures the deviation of a person's revenue distribution from a perfectly egalitarian distribution, and subsequently, its use as an independent variable in the econometric model. The Gini index takes values between 0 and 1, where 0 indicates a distribution of revenue perfectly egalitarian between the person from a society, and 1 means that a single individual takes all the revenue.

The panel data estimations and data processing has been carried out in Stata. We have used a data panel with fixed effects, thus determining a correlation of the individual effects to the explicative variables, and thus having the possibility to control the unobservable effects specific for each region. The existence of fixed effects was tested based upon the Hausman test also, which indicated the use of fixed effects in the panel. Subsequently, we checked the hypotheses on the model errors, applying tests for autocorrelation (Wooldridge test) and homoscedasticity (Wald test) (Drukker, 2003, Baum, 2001). The results showed that the errors are heteroscedastic and autocorrelated and due to this, we had to get consistent estimators by applying a robust estimation.

We took into account the assessment of two equations having the following general forms:

$$\beta_1 \ln_{educ} (\!(_{it} \beta_2 + \ln_{gva} (\!(_{it} + \beta_3 \, ir_{it} + \varepsilon_{it})$$

$$\beta_1 \ln_{gva} (\!(_{it} \beta_2 + \ln_{fdi} (\!(_{it} + \varepsilon_{it})$$

where:

ln_earn_{it} - represents the real gross average monthly earnings for every region in t year, expressed into a natural logarithm;

ln_educ_{it} – represents the post graduate and higher education graduates for every region in t year, expressed into a natural logarithm;

ln_gva_{it} – represents the gross added value for every region in t year, expressed into a natural logarithm;

ir_{it} – represents the inflation rate at national level in t year;

ln_gini_{it} – represents the Gini index for every region in t year, expressed into a natural logarithm;

ln_fdi_{it} – represents the foreign direct investments for every region in t year, expressed into a natural logarithm;

ε – model's error

The result assessed for the earnings equation is shown below:

```
. xtscc learn leduc lir lgva , fe

Regression with Driscoll-Kraay standard errors      Number of obs     =        96
Method: Fixed-effects regression                    Number of groups  =         8
Group variable (i): id                              F( 3,     7)      =    698.83
maximum lag: 2                                      Prob > F          =    0.0000
                                                    within R-squared  =    0.9917
```

learn	Coef.	Drisc/Kraay Std. Err.	t	P>|t|	[95% Conf. Interval]	
leduc	.1628995	.0341087	4.78	0.002	.2435536	.0822453
lir	.0923001	.0293475	3.15	0.016	.0229043	.161696
lgva	.9817049	.0400992	24.48	0.000	.8868854	1.076524
_cons	-16.81236	1.034624	-16.25	0.000	-19.25885	-14.36586

ln_earn_{it} = -16.8123 - 0.1628*ln_educ_{it} + 0.9817*ln_gva_{it} + 0.0923*ir_{it}
(1.03)*   (0.03)**   (0.04)*   (0.02)**

where between brackets are the robust standard errors and the *, **, *** stands for 1%, 5% and 10% significance.

Following the econometric estimations carried out based upon the data panel model, with fixed effects, it is noticed that the highest influence over the earnings on regional level is held by the gross added value (GVA) with a coefficient of 0,9817. This influence is normal as sign and size

because it is normal that the earnings level would be determined by the macroeconomic results. Practically, a GAV increase (economic growth) is reflected in the earnings increase.

The influence of the education level is normal too as sign (positive), even if it has a small associated coefficient (0.1628) as compared with gross value added. This result indicates that an increase of the education level determines a earnings increase, especially since, in generally, employees who are higher education graduates hold better paid jobs. We have to take into account that all the regions in Romania registered FDIs increases over the whole period studied and that for the most part, the investments of this type require also high skilled (trained) workers whose earnings are above the national average.

The inflation rate has the lowest influence over the earnings (coefficient 0,0923), but the positive sign shows that inflationist pressures, especially during the period 2001-2008, sustained the earnings increase. We may say that earnings were slightly adjusted (indexed) for compensating the erosion of their purchasing power caused by high inflation rates, especially in the first part of the time interval researched.

The result from assessing the Gini index equation is shown below:

```
. xtscc  lgini  lgva  lfdi  , fe

Regression with Driscoll-Kraay standard errors    Number of obs    =        88
Method: Fixed-effects regression                  Number of groups =         8
Group variable (i): id                            F( 2,      7)    =      4.14
maximum lag: 2                                     Prob > F         =    0.0649
                                                  within R-squared =    0.0712
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lgini	Coef.	Drisc/Kraay Std. Err.	t	P>|t|	[95% Conf. Interval]	
lgva	-.1697354	.0603801	-2.81	0.026	-.3125117	-.0269591
lfdi	.1250185	.0523781	2.39	0.048	.001164	.248873
_cons	-1.761095	.5698143	-3.09	0.018	-3.108492	-.4136981

$$\text{ln\_gini}_{it} = -1.7610 - 0.1697*\text{ln\_gva}_{it} + 0.1250*\text{ln\_fdi}_{it}$$
$$(0.56)** \qquad (0.06)** \qquad\qquad (0.05)**$$

where between brackets are the robust standard errors and the *, **, *** stands for 1%, 5% and 10% significance.

Having regard to the estimations result, which shows the dynamic of earnings inequality, we notice that in this case too, even if the gross added value has the highest influence (coefficient -0,1697). The negative sign related to the coefficient shows us that an increase in the economic performances can lead to a decrease in the earnings inequalities (a lower Gini index).

The FDIs influence over the earnings inequalities is a positive one, supporting the fact that for the most cases, workplaces in the foreign capital companies are better paid, and in the less-developed regions, all this increase the revenue disparities, and implicitly leading to different standard of living among the inhabitants.

4. CONCLUSIONS

The statistical analysis of the macroeconomic indicators included in the econometric model showed that earnings inequalities on regional level were slightly reduced along with the onset of economic crisis. The economic crisis period did not affect the influence indicators for the earnings inequalities within the meaning of their decrease, but reduced, however, their increase level.

Following the panel data estimations carried out on the development regions of Romania, we found out that the earnings level is most influenced in a positive way by the level of the gross added value, a fact confirming a correlation between the macroeconomic results and the earnings. The education level influences positive the earnings, indicating that well-trained (specialized) labour force is better paid. The influence of the inflation rate shows that the inflationist pressures have sustained the earnings adjustments to compensating the purchasing power's erosion.

Regarding the Gini index of the earnings inequalities, the econometric results showed a negative impact of the gross added value, indicating, to a certain extent, that an increase in the economic performances can lead to a reduction of earnings inequalities. FDIs have a positive influence, thus showing that employees within the foreign capital companies are better paid, and this aspect leads in most cases to the exacerbation of earnings inequalities.

These results show that, in order to reduce the revenue inequality and to improve the standard of living, it is important to promote regional policies which encourage the regional economic activity's development by making investments (FDIs, attracting structural funds, etc.), stimulating the increase of the production factors productivity, and especially of the labour and supporting the increase of the education level with a view to having well trained (specialized) labour force.

Obviously, the reduction of revenue disparities on regional level is a priority of the cohesion policy of the European Union, all the more that once the economic crisis started and the Europe 20/20 Agenda was adopted, the cohesion funds aim especially at creating new jobs and increasing the standard of living.

For Romania, the priority is to develop regions where the revenue level is below the national average, as well as to implement policies to revitalize the rural environment for reducing the revenue inequalities and the poverty degree. In other words, investments and the creation of jobs, entrepreneurship, education and professional training have to be encouraged.

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