

sabau, cosmin

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## Regional Development In Romania. The North-Western Region Evolution Analysis

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# **Regional Development In Romania.**

## **The North-Western Region Evolution Analysis**

Phd. Sabău Cosmin Leontin

West University of Timisoara- Faculty of Economics and Business Administration

### **Abstract**

This paper aims to capture some aspects of regional development in Romania analyzing as a case study the North-Western Region. Thus, as a result of the conducted research, it was observed that, in Romania, regional issues have become topical after the Second World War, when the first changes in the national territory took place. However, after the Revolution from 1989 the national authorities faced a visible increase in the development gap between regions, which led to a necessary development of the regional policy, whose principles and objectives to meet the European directives of the regional development. Using a series of regional macroeconomic indicators (such as GDP/capita, the civilian active population, the length of the public roads) it was conducted a thorough analysis of this area's development in recent years. In the last part of the research, it was intended to achieve a development model based on Pearson's correlation coefficient. Unfortunately, the performed calculations and the results interpretation didn't make possible to build the desired model, but there were attempts to identify the causes that led to this result.

**Key words: region, regional policy, gaps, correlation, coefficient**

### **1. Definition of the region**

Over the years the European territory has undergone many transformations. The concerned changes determined largely the emergence/recognition of new entities having an important role in various fields as the economic field, the political field, the cultural field, and so on. These entities were generally called *regions* and became decision-making actors in conducting the national and international policies.<sup>1</sup>

Quoting Paasi, authors Miklós Bakk and Cosmin Marian, believe that *"the region should not be regarded as a passive medium in which social interactions occur, but should be seen as an entity that acts autonomously on the individuals in the society."* They also affirm that *"the region is, on one hand, a social construction created through economic, political,*

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<sup>1</sup> Miklos Bakk, Cosmin Marian- *Construcția regională în Europa în Politicile regionale în România* coord. Miklos Bakk și Jozsef Benedek, ed. Polirom, 2010, p.15

*cultural and administrative practices and speeches and on the other hand, it becomes an actor of the construction, even more, it can become a power centre.*"<sup>2</sup>

In some cases, the regions are sub-national units with separate identities, in other cases they are cultural-ethnic units and in other they can be regarded as administrative subdivisions of the national state.<sup>3</sup>

The famed author Michael Keating in his work entitled *The New Regionalism in Western Europe*, talks about the region as an elusive concept that covers several territorial levels. Thus, he believes that *"a minimum definition sees the region as an intermediate territorial level between the state and the city, however this explanation is quite vast and gives a vague idea of its territorial purpose, given that, in this sense, some areas are larger than some countries"*.<sup>4</sup>

Based on this definition, Keating gives rise to a classification of the regions that can be *similar regions* defined by topography, climate or other fixed characteristics and *nodal regions* defined by a common central point.

Besides the previously mentioned definition, the same Keating expressed his point of view about the region in the most original ways, stating other definitions of the concept, such as:

- the regions can also be seen as institutional divisions, historically created or recently formed and ranging from organized bodies for the comfort of state administrators to political institutions built suddenly by a political action.
- the regions are component parts of the economical, political and social systems.

From an economic perspective, the classification of these areas is performed by taking into account several criteria, among which it can be mentioned: the production patterns, the links existing in the labor market, and also the commercial ties.<sup>5</sup>

A very important role in the emergence, development and support of the areas as a form of territorial organization on the old European continent was the one of the European Union.

Within the European Union, it all began with the need to equalize disparities within the political and fiscal decentralization. For this purpose it was created the regional policy,

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<sup>2</sup> Ibidem, p.16

<sup>3</sup> Ibidem, p.19

<sup>4</sup> Michael Keating- *Noul Regionalism în Europa Occidentală*, ed. Institutul European, 2008,p.21

<sup>5</sup> Ibidem, p.21

which should support the regions in terms of economic development and revenue growth in the state budgets.<sup>6</sup>

As a result, the governments have set up special systems of revenue collection in the regions and often have allocated large sums of money to less developed areas. Financial resources were used either for carrying out different infrastructure projects across the state, or to encourage the labor migration to these problem-regions.<sup>7</sup>

In the early period of the regional policy emergence, mainly due to the large differences in development between the regions of the European Community, the main goal was helping areas with lower economic potential. As time passed, it was observed that many of the national and regional authorities preferred to focus their financial and human resources on regions having a high growth potential because of their desire to preserve their social-economical features from other areas of the European Union.<sup>8</sup>

It should be noted that the infrastructure development, the emergence of supporting many businesses, encouraging partnerships between the private and public sectors and a higher allocation of resources to carry out activities using the region's own resources were all measures to support weaker developed regions.<sup>9</sup>

At the European level, starting with the establishment in 1975 of the European Regional Development Fund (ERDF) to reduce regional imbalances caused by uneven industrial development, it was decided to establish a statistical classification in order to record the development disparities.

Thus was born NUTS, whereby, the territory of each member state was divided into territorial units of level 1, 2 and 3. Namely, there is a system of inclusion (from the smallest to the largest) between the three levels. Level 1 includes areas with population between 3 and 7 million inhabitants, level 2 includes areas with population between 800,000 and 3 million inhabitants and level 3 consists of regions with population between 150,000 and 800,000 inhabitants.<sup>10</sup>

The same authors, Miklós Bakk and Cosmin Marian, insists upon the region, saying that its role has grown in recent years, sustaining that one can speak of a dual role of this form of territorial organization. More specifically, the two bring into question the economical and political role.

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<sup>6</sup> Ibidem, p.20

<sup>77</sup> Miklos Bakk, Cosmin Marian- *Construcția regională în Europa în Politicile regionale în România* coord. Miklos Bakk și Jozsef Benede, ed. Polirom, 2010, p.16

<sup>8</sup> Ibidem, pp.32-33

<sup>99</sup> Ibidem, pp.32-33

<sup>10</sup> Ibidem, p.37

Regarding the *economical role*, it refers to the process of European economical integration when the member states with their national territories have had to travel a long unification process of their national markets (as a whole). Regarding the *political role*, the authors talk about the introduction of multilevel governance and the transformation of the region into a political actor with its own historical and cultural identity.<sup>11</sup>

Throughout the whole Europe, regions, as features, vary a lot from state to state. For example in Germany, Belgium and Austria they are units in federal states, while in Netherlands they are groups of provinces. In Spain, Italy and France there are elected regional governments, but with different statuses and powers. In England, the regions are merely administrative divisions, without their own institutions, while Denmark and Ireland have no regions.<sup>12</sup>

If we now refer strictly to history, it must be said that regions and regionalism first appeared long ago. More specifically, the regions have preceded the emergence of nation-states and helped shape the state system. The lately development of the world economy due to the rise of globalization has caused a particular emphasis of the regions' role especially in the political area.<sup>13</sup>

With the advent of the global economic crisis that somehow showed the vulnerability of the European economy while facing new major global competitors such as China and India, the European Commission decided to establish a new economic strategy that target the current decade, started with 2010 and ending with 2020.<sup>14</sup>

Thus the EUROPE 2020 STRATEGY was born, which, besides that fact that it desired a competitiveness growth, it also outlined three main directions for the competitiveness growth for the period mentioned above.

More specifically, it concerned:<sup>15</sup>

1. smart economical growth;
2. sustainable economical growth (through production efficiency and increased competitiveness);
3. inclusive economical growth (through employment of people having a high qualification degrees and poverty reduction).

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<sup>11</sup> Miklos Bakk, Cosmin Marian- *Construcția regională în Europa în Politicile regionale în România* coord. Miklos Bakk și Jozsef Benede, ed. Polirom, 2010

<sup>12</sup> Michael Keating- *Noul Regionalism în Europa Occidentală*, ed. Institutul European, 2008, p.22

<sup>13</sup> Ibidem, p.23

<sup>14</sup> Radu Șerban- *European Economic Integration*, ed. Dacia XXI, 2010, p.151

<sup>15</sup> Ibidem, p.151

In addition to these three main directions, there were also established five objectives covering the minimum conditions which the member states must comply by 2020:<sup>16</sup>

- The employment rate of persons with aged between 20 and 64 years old to be of 75%
- Research and development to benefit from (at least 3% of EU GDP)
- Meeting the EU 20/20/20 objectives from the energy and climate changes:
  - reduce the CO2 emissions by 20% compared to 1990
  - reducing energy consumption by 20%
  - at least 20% of energy should come from renewable sources
- Early school leavers not to exceed 10% and at least 40% of youngsters should have a higher qualification degree
- Reducing the number of people with risk of poverty by 20 million.

Also, lately the terms: *region*, *city-region*, *cross-border region* has become increasingly important in the economical and geopolitical scene. Bringing them into discussion was possible due to the profound transformation suffered by the political economy especially over the last two decades and also due to the rethinking of the territories at the European level. With the increased role of regions, we have witnessed an intensification of the competition between them, with the European regional policy intended to ensure territorial cohesion within the European Union.<sup>17</sup>

Therefore, as stated in the definitions above, the regional role has increased greatly in recent years and many specialists (Keating, Paasi, Bakk, Benedek, etc.) see it as a key element in the European territory development process in the following years ago. The fact that the European space changes frequently, it can be concluded that regions will become a more active presence in the economical, social, political and cultural lives of the citizens.

It can thus be said that the region can be seen as a clearly defined territory yet belonging to the national boundaries of a state, having a legal person and clearly defined responsibilities in various fields.

More questions now arise: how will be able the regions to meet the new challenges of the Europe 2020 Strategy? We can also ask ourselves: what is their role in this strategy? Will they succeed in allowing the European citizens to maintain their living standards at a time

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<sup>16</sup> Ibidem, pp.152-153

<sup>17</sup> Anssi Paasi, *The resurgence of the 'Region' and 'Regional Identity': theoretical perspectives and empirical observations on regional dynamics in Europe*, Review of International Studies, [Review of International Studies](#) / Volume 35 / Supplement S1 / February 2009, pp 121-146

when the economic crisis has revealed so many threats that need to be faced in the coming years? All these questions have difficult answers to give now, but surely in the coming years we will receive more answers regarding the regions.

## **2. Romania's regional development: premises and evolutions**

Only after the Second World War, Romania has witnessed its first national territory changes: the formation of industrial conglomerates founded on mining. This resulted in an increase of the medium-sized cities and, at the same time, a change in the work process, the collectivization of agriculture, etc. Thus, Romania's regional economy was based on a very large proportion on the industry and in turn this economic sector depended on the technological revolution<sup>18</sup>.

Starting from those stated above and taking into account the events in Romania from the late 80s, a big problem appeared in the second half of the '90s. Because in the past it was witnessed a forced industrialization, most of the products were of no interest in the foreign markets, but only in a closed space, a fact that made them no longer competitive on the European market.<sup>19</sup>

However, due to the renunciation to the Single National Planning System, the link between central and local authorities was broken, thereby the local problems had no solving. The fact that the territory authorities did not involved determined the disadvantage of the regional development<sup>20</sup>.

It was necessary to boost the decentralization process and to proceed with the implementation of a regional development policy, since the pressure from the areas affected by strong restructuring increased and as a result of the transition from socialism to capitalism<sup>21</sup>.

The Governments after 1989 considered appropriate, as a mean of achieving the reform at the national level, the regional development policy. Here we need to recall that under communism, the gouvernants tried a uniformity in the development throughout the entire country. However, after the Revolution of 1989, due to the transition to a market economy, development gaps appeared between different parts of Romania, a situation which persists today<sup>22</sup>.

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<sup>18</sup> Iuhas, Valeriu, *Dezvoltare economică regională*, Editura Emia, Deva, 2004, p. 83.

<sup>19</sup> *Ibidem*

<sup>20</sup> *Ibidem*.

<sup>21</sup> *Ibidem*, p. 84.

<sup>22</sup> *Ibidem*, p. 85.

The year 1996 marked the start of the PHARE program in Romania and also the regional development policy emerged. Two years later, in 1998, the central authorities have performed the legal basis for its development through Law 151/1998, which sets out precisely the national policy objectives in the regional development field, *the actors* intended be involved and their skills action, together with their specific instruments<sup>23</sup>.

Subsequently, this law was supplemented by a series of laws intended to create a more clearly legal framework in terms of how to implement the regional policy within the national territory. With the start of the European Union accession negotiations, in 2002 Romania opened in chapter no. 21, dedicated to the regional policy, and who set the conditions to be met by Romania in order to join the EU as well as on the ability to become eligible for accessing the structural funds and the Cohesion Fund. Finally, the same chapter dealt with the implementation of the European law in our country.<sup>24</sup>

### **3. The principles and objectives of regional development policy in Romania**

As in other candidate countries, in Romania it was set a number of objectives to be pursued with greater enhancement of regional and local opportunities, especially since regional development policy is considered to be a conglomeration of decisions at the government level, aiming to support the economic development and to raise the living standards. The following national regional policy objectives may be mentioned<sup>25</sup>:

- reduction of current regional disparities by supporting a uniform development and revitalization of the problem areas, to which it is added the prevention of creating other imbalances;
- foundation of an institutional framework to comply with the integration conditions in the EU bodies;
- supporting cooperation between regions.

All these objectives are a component part of the measures and strategies developed at the national level, based on the following principles<sup>26</sup>:

- *the planning principle*, in order to achieve the set objectives;

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<sup>23</sup> Politica de dezvoltare regională - Proiect Phare RO 0006.18.02 – *Formarea funcționarilor publici din administrația locală în afaceri europene și managementul ciclului de proiect*, implementat de Institutul European din România în colaborare cu *human dynamics* în anul 2003, p. 43, disponibil pe [http://www.ier.ro/documente/formare/Politica\\_regionala.pdf](http://www.ier.ro/documente/formare/Politica_regionala.pdf), accesat la data de 17.10.2008

<sup>24</sup> *Ibidem*

<sup>25</sup> *Ibidem*

<sup>26</sup> *Ibidem*.

□ *the principle of co-financing*, meaning that each entity involved in regional development projects and programs must have its share of financial contribution (*co-financing*).

□ *the partnership principle* refers to the development and promotion of strong collaboration between all those involved in regional development issues;

□ *the principle of decentralization* refers to the process of decision making by passing the responsibility from the central/ government level to the regional level;

The fact that these national principles were reminded requires the reiteration of the idea that they do not replace and are not inconsistent with the principles found at the Community level: *the principle of programming, the principle of partnership, the principle of additionality and the principle of monitoring, control and evaluation*<sup>27</sup>.

All programming documents of the national regional policy which led to the accession to the EU had as main support the National Development Plan (NDP), the development regional and sectoral strategies for a certain period.

The National Development Plan (NDP) is a basic tool through which Romania seeks to recover in a short period of time the discrepancies as to the European Union in terms of social-economical development<sup>28</sup>.

Also, it should be noted that the NDP was the basis for the development of the National Strategic Reference Framework (NSRF) for 2007-2013. Thus, although the NSRF takes and synthesizes the key elements included in the NDP Analysis and Strategy, they were rearranged according to the 3 Priorities and 11 Action guidelines (Guidelines) of the Community Strategic Guidelines, reflecting the inclusion of CNRS in the European principles of Cohesion Policy.<sup>29</sup>

It must be said that NDP is presented in literature as being related to the European Cohesion Policy (Cohesion Policy) as *the strategic planning document and multiannual financial programming, developed into a broad partnership, which will guide and stimulate*

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<sup>27</sup>Politica de dezvoltare regională - Proiect Phare RO 0006.18.02 – *Formarea funcționarilor publici din administrația locală în afaceri europene și managementul ciclului de proiect*, implementat de Institutul European din România în colaborare cu *human dynamics* în anul 2003, p. 43, disponibil pe [http://www.ier.ro/documente/formare/Politica\\_regionala.pdf](http://www.ier.ro/documente/formare/Politica_regionala.pdf), accesat la data de 17.10.2008.

<sup>28</sup> Planul Național de Dezvoltare 2007-2013, disponibil pe [www.fonduri-structurale.ro](http://www.fonduri-structurale.ro), accesat la data de 03.04.2008

<sup>29</sup> Cadrul Național Strategic de Referință 2007-2013, disponibil pe <http://www.fonduri-ue.ro/upload/118786175226.pdf>

*the social-economical development of Romania in accordance with the European Union Cohesion Policy*<sup>30</sup>.

Summarizing all the above, it can be stated that NDP is a way through which it is made a prioritization of public investments made to ensure the development of the country and especially it is a tool that determines the areas for which public funds will be allocated for investments which prove their effectiveness in terms of economic and social development.

Currently, the regional development in Romania is regulated by Law no. 315 from the 28th of June 2004, published in the Official Gazette no. 577 from the 29th of June 2004.

Regional development policy in Romania is defined *as a set of policies developed at government level, through central public administration by local authorities and regional bodies specialized in consultation with the socio-economic partners involved in increasing especially economic and balanced development of the regions established areas of development, improve external competitiveness of Romania and reducing economic and social disparities between our country and other Member States of the European Community*.<sup>31</sup>

Based on this definition, it must be said that its implementation is done in full compliance with the objectives and principles of the Union. It is about the three basic principles that the European regional policy is based on: subsidiarity, decentralization and partnership.

Also, inside the same law of regional development there are also established the 8 regional development regions of Romania, established based on the existing system at community level, ie the system of classification of NUTS territorial units. According to it, they are NUTS II regions (they have a population of 2.8 million inhabitants).

- ✓ *Northern-Eastern Region* includes the following counties: Bacău, Botoșani, Iași, Neamț, Suceava and Vaslui;
- ✓ *Central Development Region* consists of Alba, Brașov, Covasna, Harghita, Mureș and Sibiu;
- ✓ *South-Muntenia Development Region* includes the following counties:: Argeș, Călărași, Dâmbovița, Giurgiu, Ialomița, Prahova și Teleorman; Arges, Calarasi, Dambovita, Giurgiu, Ialomita, Prahova and Virginia;
- ✓ *Oltenia South-Eastern Development Region* includes the following counties: Dolj, Gorj, Mehedinți, Olt and Vâlcea;

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<sup>30</sup> *Ibidem*.

<sup>31</sup> Legea nr.315 din 28.06.2004, publicată în Monitorul Oficial nr. 577 din 29.06.2004

- ✓ *Western Development Region* includes the following counties: Arad, Caraș-Severin, Hunedoara and Timiș;
- ✓ *South-Eastern Development Region* includes the following counties: Brăila, Buzău, Constanța, Galați, Vrancea and Tulcea;
- ✓ *North-Western Development Region* includes the following counties: Bihor, Bistrița–Năsăud, Cluj-Napoca, Sălaj, Satu-Mare and Maramureș;
- ✓ *Bucharest-Ilfov Development Region* includes the city of Bucharest and the Ilfov county.

#### **4. The North -Western region and its place in the country**

##### **4.1 An overview of the Northern-Western Region**

Further we will try to make a presentation of the North-Western Region and its place in the country, starting from a set of initial data, dynamically viewed, extended during 1990-2011. These data were obtained from the National Institute of Statistics and are shown in the following tables; they are reorganized and reordered according to the work needs.

The used data can be classified into three categories:

*The inhabitants* involved, one way or another, in the local economy.

*The infrastructure*, one of the fundamental factors of economic life, described (of course, schematic and simplified) in tables 3,4,5 and 6.

*The measurable outcomes* of local economic activity, described in tables 7 and 8.

##### **4.1.1 Population involved in the local economy**

In Tables no. 1 and no. 2 (the Civilian active population) which includes the years from 1990-2011, there is an increasing trend of the civilians occupying Romania, during 1990-1992, with the local maximum point reached in 1992, of 11.387, 0 thousands persons. Then, a somewhat constant declining period follows, the local minimum point reached in 2011, with 8.826.5 thousands persons.

The North-Western Region share, in the country, in terms of civilian active population is less than 13% over the entire period; this share decreases below 13% only in 1995 (12.66%) and 1997 (12.89%).

Table no.1

## Civilian active population

- thousands persons

	Year 1990	Year 1991	Year 1992	Year 1993	Year 1994	Year 1995	Year 1996	Year 1997	Year 1998	Year 1999	Year 2000
<b>TOTAL COUNTRY</b>	10.83	11.123,2	11.387,0	11.226,7	11.235,5	10.491,4	10.036,5	9.904,1	9.837,7	9.549,9	9.636,4
<b>NORTH- WESTERN Region</b>	1.411	1.470,1	1.511,8	1.482,5	1.466,7	1.328,5	1.304,6	1.276,8	1.320,4	1.274,7	1.278,9
<b>Bihor</b>	329	333,9	342,6	343,2	329,7	283,2	272,9	269,6	285,0	278,9	294,8
<b>Bistrița-Năsăud</b>	144	149,2	165,2	162,7	158,6	147,8	138,0	142,3	136,9	139,1	136,0
<b>Cluj</b>	369	397,5	411,3	396,6	401,6	346,8	359,6	349,3	351,0	332,0	334,9
<b>Maramureș</b>	259	266,0	264,6	262,2	257,8	246,5	235,4	232,8	255,4	230,5	232,4
<b>Satu Mare</b>	185	197,3	200,1	188,5	192,5	184,5	179,1	163,1	173,6	162,8	164,4
<b>Sălaj</b>	123	126,2	128,0	129,3	126,5	119,7	119,6	119,7	118,5	131,4	116,4
<b>NWR/Country Share</b>	<b>13,02</b>	<b>13,22</b>	<b>13,28</b>	<b>13,21</b>	<b>13,05</b>	<b>12,66</b>	<b>13,00</b>	<b>12,89</b>	<b>13,42</b>	<b>13,35</b>	<b>13,27</b>
<b>Bihor/NWR Share</b>	<b>23,32</b>	<b>22,71</b>	<b>22,66</b>	<b>23,15</b>	<b>22,48</b>	<b>21,32</b>	<b>20,92</b>	<b>21,12</b>	<b>21,58</b>	<b>21,88</b>	<b>23,05</b>
<b>Bistrița Năsăud/NWR Share</b>	<b>10,25</b>	<b>10,15</b>	<b>10,93</b>	<b>10,97</b>	<b>10,81</b>	<b>11,13</b>	<b>10,58</b>	<b>11,15</b>	<b>10,37</b>	<b>10,91</b>	<b>10,63</b>
<b>Cluj/NWR Share</b>	<b>26,19</b>	<b>27,04</b>	<b>27,21</b>	<b>26,75</b>	<b>27,38</b>	<b>26,10</b>	<b>27,56</b>	<b>27,36</b>	<b>26,58</b>	<b>26,05</b>	<b>26,19</b>
<b>Maramureș/NWR Share</b>	<b>18,41</b>	<b>18,09</b>	<b>17,50</b>	<b>17,69</b>	<b>17,58</b>	<b>18,55</b>	<b>18,04</b>	<b>18,23</b>	<b>19,34</b>	<b>18,08</b>	<b>18,17</b>
<b>Satu Mare/NWR Share</b>	<b>13,12</b>	<b>13,42</b>	<b>13,24</b>	<b>12,72</b>	<b>13,12</b>	<b>13,89</b>	<b>13,73</b>	<b>12,77</b>	<b>13,15</b>	<b>12,77</b>	<b>12,85</b>
<b>Sălaj/NWR Share</b>	<b>8,72</b>	<b>8,58</b>	<b>8,47</b>	<b>8,72</b>	<b>8,62</b>	<b>9,01</b>	<b>9,17</b>	<b>9,38</b>	<b>8,97</b>	<b>10,31</b>	<b>9,10</b>

Source: conducted by the author based on information gathered from the National Institute of Statistics

Table no.2

## Civilian active population

- thousands persons

	Year 2001	Year 2002	Year 2003	Year 2004	Year 2005	Year 2006	Year 2007	Year 2008	Year 2009	Year 2010	Year 2011
<b>TOTAL COUNTRY</b>	9.389	9.089	8.964	8.796	8.913	8.929	9.093	9.150	9.120	8.898	8.826
<b>NORTH- WESTERN Region</b>	1.263	1.216	1.195	1.174	1.193	1.198	1.222	1.228	1.240	1.226	1.209
<b>Bihor</b>	290	283	281	275	279	280	284	284	285	282	274
<b>Bistrița-Năsăud</b>	135	127	126	124	126	126	130	131	135	133	133
<b>Cluj</b>	329	331	324	320	323	326	340	344	345	341	339
<b>Maramureș</b>	227	213	208	208	209	205	205	205	208	207	205
<b>Satu Mare</b>	166	155	150	145	151	153	154	155	156	154	152
<b>Sălaj</b>	114	105	104	100	103	106	106	105	108	106	105
<b>NWR/Country Share</b>	<b>13,45</b>	<b>13,38</b>	<b>13,34</b>	<b>13,35</b>	<b>13,39</b>	<b>13,42</b>	<b>13,44</b>	<b>13,42</b>	<b>13,60</b>	<b>13,63</b>	<b>13,71</b>
<b>Bihor/NWR Share</b>	<b>22,97</b>	<b>23,29</b>	<b>23,57</b>	<b>23,44</b>	<b>23,45</b>	<b>23,44</b>	<b>23,30</b>	<b>23,14</b>	<b>23,04</b>	<b>23,05</b>	<b>22,70</b>
<b>Bistrița Năsăud/NWR Share</b>	<b>10,69</b>	<b>10,46</b>	<b>10,59</b>	<b>10,61</b>	<b>10,57</b>	<b>10,55</b>	<b>10,65</b>	<b>10,73</b>	<b>10,93</b>	<b>10,90</b>	<b>11,04</b>
<b>Cluj/NWR Share</b>	<b>26,07</b>	<b>27,29</b>	<b>27,14</b>	<b>27,30</b>	<b>27,13</b>	<b>27,23</b>	<b>27,83</b>	<b>28,06</b>	<b>27,87</b>	<b>28,87</b>	<b>28,02</b>
<b>Maramureș/NWR Share</b>	<b>17,98</b>	<b>17,59</b>	<b>17,41</b>	<b>17,73</b>	<b>17,55</b>	<b>17,17</b>	<b>16,83</b>	<b>17,74</b>	<b>16,81</b>	<b>16,92</b>	<b>16,95</b>
<b>Satu Mare/NWR Share</b>	<b>13,21</b>	<b>12,80</b>	<b>12,56</b>	<b>12,39</b>	<b>12,66</b>	<b>12,77</b>	<b>12,66</b>	<b>12,66</b>	<b>12,61</b>	<b>12,60</b>	<b>12,61</b>
<b>Sălaj/NWR Share</b>	<b>9,09</b>	<b>8,64</b>	<b>8,73</b>	<b>8,53</b>	<b>8,64</b>	<b>8,85</b>	<b>8,74</b>	<b>8,66</b>	<b>8,74</b>	<b>8,66</b>	<b>8,68</b>

Source: conducted by the author based on information gathered from the National Institute of Statistics

As a resource, we can roughly consider, this weight of about 13% as a constant one. In the cases of the counties, their share in the North-Western Region are relatively constant over the period between 1990 and 2011, as follows:

The first place belongs to the county of Cluj, with the civilian active population shares situated between a minimum of 26.19% and a maximum of 28.02%; the second place belongs to the county of Bihor, with the civilian active population shares situated between a minimum of 20.92 % and a maximum of 23.57%; the third place belongs to the county of Maramureş, with the civil active population shares situated between a minimum of 17.50% and a maximum of 19.34%; the fourth place belongs to the county of Satu Mare, with the civilian working population shares situated between a minimum of 12.39% and a maximum of 13.89%; the fifth place belongs to the county of Sălaj, with the civilian active population shares situated between a minimum of 8.47% and a maximum of 10.31% .

#### 4.1.2 Infrastructure

We intend to present the infrastructure by two indicators: **the length of the public roads and the length of the railways lines.**

*Table no.3* **The length of the public roads** - km

	Year 1990	Year 1991	Year 1992	Year 1993	Year 1994	Year 1995	Year 1996	Year 1997	Year 1998	Year 1999	Year 2000
<b>TOTAL COUNTRY</b>	72816	72816	72816	72816	72828	72859	73160	73161	73260	73435	78479
<b>NORTH-WESTERN Region</b>	10652	10652	10652	10652	10659	10681	10818	10820	10822	10866	11566
<b>Bihor</b>	2491	2491	2491	2491	2491	2491	2491	2491	2491	2491	2664
<b>Bistrița-Năsăud</b>	1304	1304	1304	1304	1304	1310	1446	1446	1446	1490	1504
<b>Cluj</b>	2447	2447	2447	2447	2447	2451	2451	2451	2454	2454	2639
<b>Maramureș</b>	1494	1494	1494	1494	1501	1501	1501	1501	1501	1496	1569
<b>Satu Mare</b>	1511	1511	1511	1511	1511	1523	1524	1525	1525	1525	1604
<b>Sălaj</b>	1405	1405	1405	1405	1405	1405	1405	1406	1405	1410	1586
<b>NWR/Country Share</b>	<b>14,63</b>	<b>14,63</b>	<b>14,63</b>	<b>14,63</b>	<b>14,64</b>	<b>14,66</b>	<b>14,79</b>	<b>14,79</b>	<b>14,77</b>	<b>14,80</b>	<b>14,74</b>
<b>Bihor/NWR Share</b>	<b>23,39</b>	<b>23,39</b>	<b>23,39</b>	<b>23,39</b>	<b>23,37</b>	<b>23,32</b>	<b>23,03</b>	<b>23,02</b>	<b>23,02</b>	<b>22,92</b>	<b>23,03</b>
<b>Bistrița Năsăud/NWR Share</b>	<b>12,24</b>	<b>12,24</b>	<b>12,24</b>	<b>12,24</b>	<b>12,23</b>	<b>12,26</b>	<b>13,37</b>	<b>13,36</b>	<b>13,36</b>	<b>13,71</b>	<b>13,00</b>
<b>Cluj/NWR Share</b>	<b>22,97</b>	<b>22,97</b>	<b>22,97</b>	<b>22,97</b>	<b>22,96</b>	<b>22,95</b>	<b>22,66</b>	<b>22,65</b>	<b>22,68</b>	<b>22,58</b>	<b>22,82</b>
<b>Maramureș/NWR Share</b>	<b>14,03</b>	<b>14,03</b>	<b>14,03</b>	<b>14,03</b>	<b>14,08</b>	<b>14,05</b>	<b>13,88</b>	<b>13,87</b>	<b>13,87</b>	<b>13,77</b>	<b>13,57</b>
<b>Satu Mare/NWR Share</b>	<b>14,19</b>	<b>14,19</b>	<b>14,19</b>	<b>14,19</b>	<b>14,18</b>	<b>14,26</b>	<b>14,09</b>	<b>14,09</b>	<b>14,09</b>	<b>14,03</b>	<b>13,87</b>
<b>Sălaj/NWR Share</b>	<b>13,19</b>	<b>13,19</b>	<b>13,19</b>	<b>13,19</b>	<b>13,18</b>	<b>13,15</b>	<b>12,99</b>	<b>12,99</b>	<b>12,98</b>	<b>12,98</b>	<b>13,71</b>

Source: conducted by the author based on information gathered from the National Institute of Statistics

Regarding **the length of the public roads**, the North-Western Region share, in the whole country, is less than 15% over the period from 1990 to 2011, with a maximum of 14.96% in 2010 and a minimum of 14.55 % in 2001.

*Table no.4* **The length of the public roads** - km

	Year 2001	Year 2002	Year 2003	Year 2004	Year 2005	Year 2006	Year 2007	Year 2008	Year 2009	Year 2010	Year 2011
<b>TOTAL COUNTRY</b>	78492	78896	79001	79454	79904	79952	80893	81693	81713	82386	83703
<b>NORTH-WESTERN Region</b>	11418	11583	11569	11858	11855	11884	11927	12084	12183	12322	12459
<b>Bihor</b>	2515	2664	2664	2951	2956	2971	2971	2975	2975	2975	2975
<b>Bistrița-Năsăud</b>	1504	1504	1504	1504	1505	1511	1539	1517	1510	1509	1581
<b>Cluj</b>	2639	2639	2639	2641	2633	2630	2625	2633	2673	2699	2720
<b>Maramureș</b>	1570	1575	1575	1575	1575	1575	1561	1718	1779	1778	1785
<b>Satu Mare</b>	1604	1620	1606	1606	1605	1606	1632	1639	1644	1647	1647
<b>Sălaj</b>	1586	1581	1581	1581	1581	1591	1599	1602	1602	1714	1751
<b>NWR/Country Share</b>	<b>14,55</b>	<b>14,68</b>	<b>14,64</b>	<b>14,82</b>	<b>14,84</b>	<b>14,86</b>	<b>14,74</b>	<b>14,79</b>	<b>14,91</b>	<b>14,96</b>	<b>14,88</b>
<b>Bihor/NWR Share</b>	<b>22,03</b>	<b>23,00</b>	<b>23,03</b>	<b>24,89</b>	<b>24,93</b>	<b>25,00</b>	<b>24,91</b>	<b>24,62</b>	<b>24,42</b>	<b>24,14</b>	<b>23,88</b>
<b>Bistrița Năsăud/NWR Share</b>	<b>13,17</b>	<b>12,98</b>	<b>13,00</b>	<b>12,68</b>	<b>12,70</b>	<b>12,71</b>	<b>12,90</b>	<b>12,55</b>	<b>12,39</b>	<b>12,25</b>	<b>12,69</b>
<b>Cluj/NWR Share</b>	<b>23,11</b>	<b>22,78</b>	<b>22,81</b>	<b>22,27</b>	<b>22,21</b>	<b>22,10</b>	<b>22,01</b>	<b>21,79</b>	<b>21,94</b>	<b>21,90</b>	<b>21,83</b>
<b>Maramureș/NWR Share</b>	<b>13,75</b>	<b>13,60</b>	<b>13,61</b>	<b>13,28</b>	<b>13,29</b>	<b>13,25</b>	<b>13,09</b>	<b>14,22</b>	<b>14,60</b>	<b>14,43</b>	<b>14,33</b>
<b>Satu Mare/NWR Share</b>	<b>14,05</b>	<b>13,99</b>	<b>13,88</b>	<b>13,54</b>	<b>13,51</b>	<b>13,51</b>	<b>13,68</b>	<b>13,56</b>	<b>13,49</b>	<b>13,37</b>	<b>13,22</b>
<b>Sălaj/NWR Share</b>	<b>13,89</b>	<b>13,65</b>	<b>13,67</b>	<b>13,33</b>	<b>13,39</b>	<b>13,39</b>	<b>13,41</b>	<b>13,26</b>	<b>13,15</b>	<b>13,91</b>	<b>14,05</b>

Source: conducted by the author based on information gathered from the National Institute of Statistics

Also regarding the counties, their shares in the North-Western Region are relatively constant over the entire period from 1990 to 2011, as follows:

The first place belongs to the county of Bihor, with shares of the length of the public roads situated between a minimum of 22.03% and a maximum of 24.93%; the second place belongs to the county of Cluj, with shares of the length of the public roads ranging from a minimum of 21.79 % and a maximum of 23.11%; the third place belongs to the county of Satu Mare, with shares of the length of the public roads situated between a minimum of 13.22% and a maximum of 14.26%; the fourth place belongs to the county of Maramureș, with shares of the length of the public roads situated between a minimum of 13.09% and a maximum of 14.60%; finally, the fifth place is for the county of Sălaj, with shares of the length of public situated between a minimum of 12.99% and a maximum of 14.05%.

As for **the length of the railway lines** (tables no.5 and 6) the North-Western Region share, in the whole country, is about of under 15-16% over the period from 1990 to 2011, with a maximum of 15, 90% in 1990 and a minimum of 14.79% in 2003.

Table no.5

## The length of the railway lines

- km

	Year 1990	Year 1991	Year 1992	Year 1993	Year 1994	Year 1995	Year 1996	Year 1997	Year 1998	Year 1999	Year 2000
<b>TOTAL</b>	11348	11365	11430	11380	11374	11376	11385	11380	11010	10981	11015
<b>NORTH- WESTERN Region</b>	1804	1804	1804	1804	1804	1804	1804	1796	1659	1645	1645
<b>Bihor</b>	474	474	474	474	474	474	474	474	474	474	474
<b>Bistrița-Năsăud</b>	365	365	365	365	365	365	365	365	321	321	321
<b>Cluj</b>	259	259	259	259	259	259	259	259	232	232	232
<b>Maramureș</b>	232	232	232	232	232	232	232	231	222	222	222
<b>Satu Mare</b>	298	298	298	298	298	298	298	291	234	220	220
<b>Sălaj</b>	176	176	176	176	176	176	176	176	176	176	176
<b>NWR/Country Share</b>	<b>15,90</b>	<b>15,87</b>	<b>15,78</b>	<b>15,85</b>	<b>15,86</b>	<b>15,86</b>	<b>15,85</b>	<b>15,78</b>	<b>15,07</b>	<b>14,98</b>	<b>14,93</b>
<b>Bihor/NWR Share</b>	<b>26,27</b>	<b>26,27</b>	<b>26,27</b>	<b>26,27</b>	<b>26,27</b>	<b>26,27</b>	<b>26,27</b>	<b>26,39</b>	<b>28,57</b>	<b>28,81</b>	<b>28,81</b>
<b>Bistrița Năsăud/NWR Share</b>	<b>20,23</b>	<b>20,23</b>	<b>20,23</b>	<b>20,23</b>	<b>20,23</b>	<b>20,23</b>	<b>20,23</b>	<b>20,32</b>	<b>19,35</b>	<b>19,51</b>	<b>19,51</b>
<b>Cluj/NWR Share</b>	<b>14,36</b>	<b>14,36</b>	<b>14,36</b>	<b>14,36</b>	<b>14,36</b>	<b>14,36</b>	<b>14,36</b>	<b>14,42</b>	<b>13,98</b>	<b>14,10</b>	<b>14,10</b>
<b>Maramureș/NWR Share</b>	<b>12,86</b>	<b>12,86</b>	<b>12,86</b>	<b>12,86</b>	<b>12,86</b>	<b>12,86</b>	<b>12,86</b>	<b>12,86</b>	<b>13,38</b>	<b>13,50</b>	<b>13,50</b>
<b>Satu Mare/NWR Share</b>	<b>16,52</b>	<b>16,52</b>	<b>16,52</b>	<b>16,52</b>	<b>16,52</b>	<b>16,52</b>	<b>16,52</b>	<b>16,20</b>	<b>14,10</b>	<b>13,37</b>	<b>13,37</b>
<b>Sălaj/NWR Share</b>	<b>9,76</b>	<b>9,76</b>	<b>9,76</b>	<b>9,76</b>	<b>9,76</b>	<b>9,76</b>	<b>9,76</b>	<b>9,80</b>	<b>10,61</b>	<b>10,70</b>	<b>10,70</b>

Source: conducted by the author based on information gathered from the National Institute of Statistics

Table no.6

## The length of the railway lines

- km

	Year 2001	Year 2002	Year 2003	Year 2004	Year 2005	Year 2006	Year 2007	Year 2008	Year 2009	Year 2010	Year 2011
<b>TOTAL</b>	11015	11002	11077	11053	10948	10789	10777	10785	10784	10785	10777
<b>NORTH- WESTERN Region</b>	1645	1645	1638	1641	1678	1678	1668	1668	1668	1668	1668
<b>Bihor</b>	474	474	474	474	500	500	500	500	500	500	500
<b>Bistrița-Năsăud</b>	321	321	321	321	321	321	320	320	320	320	320
<b>Cluj</b>	232	232	232	232	240	240	240	240	240	240	240
<b>Maramureș</b>	222	222	215	219	207	207	207	207	207	207	207
<b>Satu Mare</b>	220	220	220	219	215	215	218	218	218	218	218
<b>Sălaj</b>	176	176	176	176	196	196	183	183	183	183	183
<b>NWR/Country Share</b>	<b>14,93</b>	<b>14,95</b>	<b>14,79</b>	<b>14,85</b>	<b>15,33</b>	<b>15,55</b>	<b>15,48</b>	<b>15,47</b>	<b>15,47</b>	<b>15,47</b>	<b>15,48</b>
<b>Bihor/NWR Share</b>	<b>28,81</b>	<b>28,81</b>	<b>28,94</b>	<b>28,88</b>	<b>29,80</b>	<b>29,80</b>	<b>29,98</b>	<b>29,98</b>	<b>29,98</b>	<b>29,98</b>	<b>29,98</b>
<b>Bistrița Năsăud/NWR Share</b>	<b>19,51</b>	<b>19,51</b>	<b>19,60</b>	<b>19,56</b>	<b>19,07</b>	<b>19,07</b>	<b>19,18</b>	<b>19,18</b>	<b>19,18</b>	<b>19,18</b>	<b>19,18</b>
<b>Cluj/NWR Share</b>	<b>14,10</b>	<b>14,10</b>	<b>14,16</b>	<b>14,14</b>	<b>14,30</b>	<b>14,30</b>	<b>14,39</b>	<b>14,39</b>	<b>14,39</b>	<b>14,39</b>	<b>14,39</b>
<b>Maramureș/NWR Share</b>	<b>13,50</b>	<b>13,50</b>	<b>13,13</b>	<b>13,35</b>	<b>12,34</b>	<b>12,34</b>	<b>12,41</b>	<b>12,41</b>	<b>12,41</b>	<b>12,41</b>	<b>12,41</b>
<b>Satu Mare/NWR Share</b>	<b>13,37</b>	<b>13,37</b>	<b>13,43</b>	<b>13,35</b>	<b>12,81</b>	<b>12,81</b>	<b>13,07</b>	<b>13,07</b>	<b>13,07</b>	<b>13,07</b>	<b>13,07</b>
<b>Sălaj/NWR Share</b>	<b>10,70</b>	<b>10,70</b>	<b>10,70</b>	<b>10,73</b>	<b>11,68</b>	<b>11,68</b>	<b>10,97</b>	<b>10,97</b>	<b>10,97</b>	<b>10,97</b>	<b>10,97</b>

Source: conducted by the author based on information gathered from the National Institute of Statistics

Regarding the counties, their share in the North-Western Region are relatively constant throughout the period from 1990 to 2011, as follows:

The first place belongs to the county of Bihor, with shares of the length of the railway lines situated between a minimum of 27.27% and a maximum of 29.98%; the second place belongs to the county of Bistrița Năsăud, with shares of the length of the railway lines ranging from a minimum of 19.35 % and a maximum of 20.23%; the third place belongs to the county of Satu Mare, with shares of the length of the railway lines situated between a minimum of 12.81% and a maximum of 16.52%; the fourth place belongs to the county of Cluj, with shares of the length of the railway lines situated between a minimum of 14.10% and a maximum of 14.42%; finally, the fifth place is for the county of Sălaj, with shares of the length of the railway lines situated between a minimum of 9.76% and a maximum of 11.68%.

#### 4.1.3 The measurable results of local activities

These can be summarized by the GDP/capita, brought in the prices of the last year with data, more precisely in 2010. We decided to use these data in order to make relevant comparisons to the prices of 2010.

From the analysis of the data in the table it is observed that the North-Western is below the national average, every year, but still remains close to it. The only county that exceeds the national average every year is Cluj, hovering with 30-40% over the average of the North-Western Region.

Table no.7 GDP/capita (RON/inhabitant current prices)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Total country</b>	<b>3609,7</b>	<b>5263,5</b>	<b>6974,9</b>	<b>9084,0</b>	<b>11413,5</b>	<b>13362,8</b>	<b>15967,6</b>	<b>19315,4</b>	<b>23934,6</b>	<b>23341,4</b>	<b>24435,9</b>
<b>NORTH-WESTERN AREA</b>	<b>3322,3</b>	<b>4912,3</b>	<b>6690,7</b>	<b>8639,7</b>	<b>10901,2</b>	<b>12538,6</b>	<b>14946,6</b>	<b>18610,5</b>	<b>21542,1</b>	<b>21297,4</b>	<b>21827,2</b>
<i>BIHOR</i>	3485,2	5373,8	7769,0	9769,2	12316,5	13442,3	15925,5	19337,3	22619,2	21501	22521,6
<i>BISTRITA-NASAUD</i>	2846,0	3864,2	5327,7	7025,9	8527,2	10791,4	12862,7	15713,8	18776,5	19003,8	17791,8
<i>CLUJ</i>	4474,6	6353,4	8555,0	11161,4	14140,0	16565,8	19663,7	26029,9	29480,6	29445,4	30626,5
<i>MARAMURES</i>	2482,3	3644,6	4952,8	6315,7	8305,7	9374,9	11511,8	13670,0	15905,3	16075,5	16617,8
<i>SATU MARE</i>	2909,6	4679,6	6055,8	7667,3	9766,3	10865,1	12782,1	14583,8	17257,9	16939,6	16990,5
<i>SALAJ</i>	2666,3	4054,7	5250,5	7355,7	8679,7	10369,7	12467,7	15971,6	18221,5	18165,7	18542,1

Source: conducted by the author based on information gathered from the National Institute of Statistics

Regarding the counties, their share in the North-Western Region are relatively constant throughout the entire period between 1990 and 2011, as follows:

The first place belongs to the county of Cluj, the share of GDP/capita ranging from a minimum of 129.19% and a maximum of 140.31%; the second place belongs to the county of Bihor, the share of GDP/capita ranging from a minimum of 100.96 % and a maximum of 116.12%; the third place belongs to the county of Satu Mare, the share of GDP/capita ranging from a minimum of 78.36% and a maximum of 95.26%; the fourth place belongs to the county of Sălaj, with weights GDP/capita ranging from a minimum of 78.47% and a maximum of 85.82%; finally, the fifth place is for the county of Maramureș, with a share of GDP/capita situated between a minimum of 73.10% and a maximum of 76.19%.

Table no.8 GDP/capita (RON/inhabitant comparable prices, level of year 2010)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>TOTAL COUNTRY</b>	<b>10088,1</b>	<b>11290,1</b>	<b>12695,7</b>	<b>14486,3</b>	<b>16659,1</b>	<b>17951,6</b>	<b>19743,9</b>	<b>23217,1</b>	<b>27065,2</b>	<b>25199,4</b>	<b>24435,9</b>
<b>NORTH-WESTERN Region</b>	<b>9284,9</b>	<b>10536,9</b>	<b>12178,4</b>	<b>13777,7</b>	<b>15911,4</b>	<b>16844,3</b>	<b>18481,5</b>	<b>22369,8</b>	<b>24359,9</b>	<b>22992,7</b>	<b>21827,2</b>
<b>Bihor</b>	9740,0	11526,8	14141,1	15579,0	17977,2	18058,4	19691,9	23243,5	25577,8	23212,5	22521,6
<b>Bistrița-Năsăud</b>	7953,8	8288,7	9697,6	11204,2	12446,3	14497,1	15904,8	18888,0	21232,5	20516,5	17791,8
<b>Cluj</b>	12505,2	13628,0	15571,8	17799,1	20638,7	22254,4	24314,2	31287,9	33336,6	31789,3	30626,5
<b>Maramureș</b>	6937,3	7817,7	9015,1	10071,6	12123,0	12594,3	14234,4	16431,3	17985,7	17355,1	16617,8
<b>Satu Mare</b>	8131,5	10037,7	11022,8	12227,1	14254,9	14596,2	15805,1	17529,7	19515,3	18288,0	16990,5
<b>Sălaj</b>	7451,6	8697,3	9557,0	11730,2	12668,9	13930,7	15416,4	19197,8	20604,9	19611,7	18542,1
<b>NWR/Country Share</b>	<b>92,04</b>	<b>93,33</b>	<b>95,93</b>	<b>95,11</b>	<b>95,51</b>	<b>93,83</b>	<b>93,61</b>	<b>96,35</b>	<b>90,00</b>	<b>91,24</b>	<b>89,32</b>
<b>Bihor/NWR Share</b>	<b>104,90</b>	<b>109,39</b>	<b>116,12</b>	<b>113,07</b>	<b>112,98</b>	<b>107,21</b>	<b>106,55</b>	<b>103,91</b>	<b>105,00</b>	<b>100,96</b>	<b>103,18</b>
<b>Bistrița Năsăud/NWR Share</b>	<b>85,66</b>	<b>78,66</b>	<b>79,63</b>	<b>81,32</b>	<b>78,22</b>	<b>86,07</b>	<b>86,06</b>	<b>84,44</b>	<b>87,16</b>	<b>89,23</b>	<b>81,51</b>
<b>Cluj/NWR Share</b>	<b>134,68</b>	<b>129,34</b>	<b>127,86</b>	<b>129,19</b>	<b>129,71</b>	<b>132,12</b>	<b>131,56</b>	<b>139,87</b>	<b>136,85</b>	<b>138,26</b>	<b>140,31</b>
<b>Maramureș/NWR Share</b>	<b>74,72</b>	<b>74,19</b>	<b>74,03</b>	<b>73,10</b>	<b>76,19</b>	<b>74,77</b>	<b>77,02</b>	<b>73,45</b>	<b>73,83</b>	<b>75,48</b>	<b>76,13</b>
<b>Satu Mare/NWR Share</b>	<b>87,58</b>	<b>95,26</b>	<b>90,51</b>	<b>88,75</b>	<b>89,59</b>	<b>86,65</b>	<b>85,52</b>	<b>78,36</b>	<b>80,11</b>	<b>79,54</b>	<b>77,84</b>
<b>Sălaj/NWR Share</b>	<b>80,26</b>	<b>82,54</b>	<b>78,47</b>	<b>85,14</b>	<b>79,62</b>	<b>82,70</b>	<b>83,42</b>	<b>85,82</b>	<b>84,59</b>	<b>85,30</b>	<b>84,95</b>

Source: conducted by the author based on information gathered from the National Institute of Statistics

## 4.2 Building a model of evolution

We will try to build a model of evolution, considering as the output variable the GDP/capita of the North-Western Region and as the input variables the civilian active population, the length of the public roads and the length of the railway lines. Unfortunately, we will have to use the data for the period 2000-2010, because they are the common data throughout the whole set of tables.

We will consider as an *output variable* the GDP/capita dependency in the prices of 2010 and, as an *input variable*, the independent civilian active population, and as a *compose*

*indicator*, the length of the communication methods. This indicator is formed by summing the length of public roads and the length of the railway lines. The Pearson correlation coefficient will be applied on the two dependencies in order to check whether or not there is a link dependency. Then we will try to build a model of evolution over time.

For all these calculations, the following formulas related to the Pearson coefficient will be used:

$R_{xy} = (SC_{xy}) / (SS_x * SS_y)^{1/2}$ , where  $SS_x = \sum X_i^2 - ((\sum X_i)^2) / N$ ,

$SS_y = \sum Y_i^2 - ((\sum Y_i)^2) / N$

$SC_{xy} = \sum (X_i * Y_i) - ((\sum X_i) * (\sum Y_i)) / N$

In this case,  $R_{xy}$  shows the meaning of the connection, direct or inverse, and squared shows the strength of bond. The more are the values closer to 0, the connection is weaker or non-existent and the more the values are closer to 1, the connection is more intense, stronger.

*Table no.9* GDP/capita (RON/inhabitant comparable prices, level of year 2010)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
NORTH-WESTERN AREA	9.284,9	10.536,9	12.178,4	13.777,7	15.911,4	16.844,3	18.481,5	22.369,8	24.359,9	22.992,7	21.827,2
	100,0	113,5	131,2	148,4	171,4	181,4	199,0	240,9	262,4	247,6	235,1

Source: conducted by the author based on information gathered from the National Institute of Statistics

*Table no.10* The civilian active population

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
NORTH-WESTERN Region	1.278,9	1.263,1	1.216,3	1.195,8	1.174,0	1.193,6	1.198,4	1.222,4	1.228,1	1.240,6	1.226,7
	107,1	105,8	101,9	100,2	98,4	100,0	100,4	102,4	102,9	103,9	102,8

Source: conducted by the author based on information gathered from the National Institute of Statistics

*Table no.11* The length of the public roads - km

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
NORTH-WESTERN Region	11566	11418	11583	11569	11858	11855	11884	11927	12084	12183	12322

Source: conducted by the author based on information gathered from the National Institute of Statistics

Table no.12

## The length of the railway lines

- km

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>NORTH-WESTERN Region</b>	<b>1645</b>	<b>1645</b>	<b>1645</b>	<b>1638</b>	<b>1641</b>	<b>1678</b>	<b>1678</b>	<b>1668</b>	<b>1668</b>	<b>1668</b>	<b>1668</b>

Source: conducted by the author based on information gathered from the National Institute of Statistics

Table no.13

## The correlation coefficient calculation

Yi=GDP/cap	X1i=civ act pop	X2i=leng comm methods	Yi*Yi	X1i*Yi	X1i*X1i	X2i*X2i	X2i*Yi
100,0	107,1	101,2	10000	10710	11470,41	10241,44	10120
113,5	105,8	100,1	12882,25	12008,3	11193,64	10020,01	11361,35
131,2	101,9	101,3	17213,44	13369,28	10383,61	10261,69	13290,56
148,4	100,2	101,2	22022,56	14869,68	10040,04	10241,44	15018,08
171,4	98,4	103,4	29377,96	16865,76	9682,56	10691,56	17722,76
181,4	100,0	103,7	32905,96	18140	10000	10753,69	18811,18
199,0	100,4	103,9	39601	19979,6	10080,16	10795,21	20676,1
204,9	102,4	104,1	41984,01	20981,76	10485,76	10836,81	21330,09
262,4	102,9	105,3	68853,76	27000,96	10588,41	11088,09	27630,72
247,6	103,9	106,1	61305,76	25725,64	10795,21	11257,21	26270,36
235,1	102,8	107,2	55272,01	24168,28	10567,84	11491,84	25202,72
<b>Σyi=1.994,9</b>	<b>ΣX1y=1.125,8</b>	<b>ΣX2i=1.137,5</b>	<b>(Σyi)**2 =391.418,7</b>	<b>ΣX1i*yi =203.819,3</b>	<b>(ΣX1i)**2 =115.287,6</b>	<b>(ΣX2i)**2 =117.679,0</b>	<b>ΣX2i*yi= 207.433,9</b>

Source: conducted by the author based on information gathered from the National Institute of Statistics

The initial data and calculations are presented in the table above.

Rx1iY=	-0,25
R2X1iY=	0,0625
Rx2iY=	0,35
R2X2iY=	0,1225

Therefore, from the performed calculations, the Pearson correlation coefficient was obtained for GDP/capita and civilian active population of 0.25% variables and, by squaring, it is 0.00625. Since the maximum possible value to have a functional link is 1, it results that the two variables are not related. The GDP/capita dynamics is due to other cause, and not due to the civilian active population dynamics.

In the other case, the value of Pearson correlation coefficient for GDP/capita and length of communication methods variables is of 0.35% and, by squaring, it is 0.1225. This value also is far from the maximum possible value, ie 1, to get a functional link. Therefore, again there is no connection between the two variables. Proceeding with the interpretation, it can be stated that the GDP/capita dynamics is due to other causes, and not due to the communication methods dynamics.

As an interpretation of the previous calculations we can estimate that the GDP/capita dynamics is originated in other cases, such as, for example, a better use of existing resources or even their closer reallocation to an optimum local. Thus, building a model of evolution and its testing, starting from the used data, is pointless.

## **Conclusions**

The undertaken research on the regional development in Romania and the development situation of the North-Western Region main ideas results:

In the first place, the regional development in Romania has become a huge challenge especially after joining the European Union in 2007. With the foundation of the legislation in this area, it began to be formed the institutions dealing with the implementation of national and European regional policy.

In the second place, from the available data for the period of 1990-2011 it can be observed that in the North-Western region there are quite important differences among components counties in terms of both infrastructure and GDP per capita. In fact, the development gaps exist between all 8 regions that make up Romania, their deepening realizing especially in the last 20 years.

In the third place, it is noted that within the North-Western region, the county of Cluj holds the leading position for the level of development (we refer here to all the indicators studied).

Fourth, for years to come, the Romanian authorities have proposed to reduce the development disparities both nationally and in relation to the European average. With the redistribution of the national territory to be held this year, it is hoped that the 2014-2020 financial programming exercise to attract more European money for the balanced development of all the regions of the country.

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