

THE SMART SPECIALIZATION STRATEGY OF THE SOUTH- EAST DEVELOPMENT REGION



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List of acronyms

CAI	Comparative Advantage Index
CIF	Cost, Insurance, Freight
CN	Combined Nomenclature
CPI	Competitive Potential Index
DFI	Direct Foreign Investments
ERDF	European Regional Development Funds
ESIF	European Structural and Investment Funds
EU	European Union
FOB	Free on Board
GAV	Gross Added Value
GDP	Gross Domestic Product
GPT	General Purpose Technologies
GVC	Global Value Chain
ICT	Information and Communication Technology
MRDPAEF	Ministry of Regional Development, Public Administration and European Funds
NACE	Classification of Activities in the National Economy
NASRI	National Authority for Scientific Research and Innovation
NACSBP	Nomenclature for the analysis and comparison of scientific budgets and programs
NBR	National Bank of Romania
NIS	National Institute of Statistics
NP	National Programme
NPRTDI	National Plan for Research, Technological Development and Innovation

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NRDP	National Rural Development Programme
NSC	National Strategy for Competitiveness
NSRDI	National Strategy for Research, Development and Innovation 2014-2020
OECD	Organization for Economic Cooperation and Development
PPP	Purchasing Power Parity
PPS	Purchasing Power Standard
RDA	Regional Development Agency
RDI	Research Development Innovation
RIC	Regional Innovation Consortium
RIS3	Regional Innovation Strategy
ROP	Regional Operational Programme
SBA	Small Business Act
SOIT	State Office for Inventions and Trademarks
SOP ICE	Sectoral Operational Programme Increase of Economic Competitiveness
SEO	Social Economy Organizations
SMEs	Small and Medium Enterprises
SSS SEDR	Smart Specialization Strategy of South-East Development Region
SWOT	Strenghts, Weaknesses, Threats and Opportunities

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Introduction

The purpose of the strategy

Investments in research, innovation and entrepreneurship represent the core of Europe 2020 strategy and also a key response of Europe to the difficulties created by the economic crisis. According to the Guide to Research and Innovation Strategies for Smart Specialization (RIS3), the adoption of an integrated and strategic approach to innovation is a key factor that maximizes the potential for research and innovation at European, national and regional level.

The concept of regional smart specialization (RIS3) has the role to provide the necessary context for substantiating the investments made in the areas of research, development and innovation achieved through the EU cohesion policy. This concept was also promoted in the paper "Regional policy contributing to smart growth in Europe 2020". In this document, the European Commission encourages the development of national and regional research and innovation strategies for smart specialization as a means to provide sustained support from the Structural Funds. Intelligent specialization requires a strategic and integrated approach to harness the potential for smart growth and knowledge-based economy in all regions.

The RIS3 approach is relevant to all the three priorities of Europe 2020 Strategy, namely:

- smart growth through more efficient investments in education, research and innovation;
- sustainable growth through decisive focus on a low-carbon economy;
- inclusive growth, with an emphasis on job creation and on poverty reduction.

Smart specialization is based on a process of "entrepreneurial discovery" and identifying areas where a region excels or has the potential to excel in the future. This approach is also included in the Cohesion Policy 2014-2020, which is a conditionality for the use of European Regional Development Fund (ERDF) for competitive development in 2014-2020.

Smart specialization strategies are an appropriate way of solving and addressing social, environmental, climate and energy challenges such as demographic change, resource efficiency, energy security and resilience to climate change. A precondition of regional development strategies is to identify the unique features and strengths of each country and region, to highlight the competitive advantages of each region, and to involve

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stakeholders and regional resources around a vision focused on the criterion of excellence on their future.

RIS3 concentrates economic development efforts and investments on the relative advantages of each region, exploiting economic opportunities and emerging trends, acting to stimulate economic growth. RIS3 increases the added value, impact and visibility of EU funding. It ensures efficiency in spending money in a period of budgetary constraints and (more) limited public resources. RIS3 provides synergies between policies and funding at European level, complementing national and regional schemes and private sector investment. Creating a smart specialization strategy is necessary and is the best way to improve benefits in terms of research, development and innovation.

In this context, the South-East Regional Development Agency, as a non-governmental public body, active in the field of regional development, has proposed the development of a Smart Specialization Strategy for the region. The main objective of this strategy is to contribute to substantiating the process of strategic planning for the development of South-East Region for the 2014-2020 programming period, by analyzing the current state of economic development of the region, focusing on the identification of the best performing sectors at regional level, with competitive advantages. Following the elaboration of the SSS SEDR, there will be identified the priority areas in which the investments will be concentrated in the next programming period 2014-2020, as well as the framework necessary for the development of an efficient economic and social environment at regional level.

The process of developing the strategy

The Smart Specialization Strategy of the South-East Development Region was implemented through a partnership process that aimed to involve sectors with a strong innovative character (enterprises, young entrepreneurs, clusters, business organizations / chambers of commerce, universities, public and private institutions/research bodies, science and technology parks, entities of technological transfer, local public authorities, incubators, county school inspectorates, NGOs, social organizations and other relevant institutions).

The elaboration of the Smart Specialization Strategy for South-East Development Region focused on a limited number of competitive areas, identified following the socio-economic analysis carried out at regional level and following a qualitative and quantitative analysis among the representatives of business environment, business support structures, universities, research institutes, research centers and centers of technology transfer. The

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partnership process for setting out innovation priorities at regional level will ensure the responsibility for the implementation of the Smart Specialization Strategy.

The Smart Specialization Strategy of the South-East Development Region 2014-2020 includes the following main directions:

- Analyzing the regional context and innovation potential;
- Organizing a minimum number of six working meetings (Focus Groups) on the areas of smart specialization identified at regional level, with the relevant target group representatives on each field;
- Applying surveys (through questionnaires) among each category of target group representatives;
- Developing a global vision for the future of the region;
- Defining coherent policy combinations, directives and action plans;
- Integrating the mechanisms for monitoring and evaluating the Smart Specialization Strategy of the South-East Development Region.

The development of Smart Specialization Strategy for South-East Development Region 2014-2020 implied the use of an appropriate methodology, based on an optimal mix of methods and techniques: collection of data / information, quantitative analysis and qualitative analysis.

In order to develop the Smart Specialization Strategy of the South-East Development Region 2014-2020, it was taken into account the correlation with the main European, national and regional strategic documents relevant for the period 2014-2020:

- Guide to Research and Innovation - Strategies for Smart Specialization S3, endorsed at EU level;
- National Strategy for Research-Development-Innovation and the National Strategy for the Smart Specialization of Romania for the period 2014-2020;
- National Strategy for Competitiveness 2014-2020;
- Plan of measures to stimulate the establishment and development of SMEs through the implementation of the Small Business Act (SBA);
- Operational Programs of Romania under the 2014-2020 Partnership Agreement with the European Union: Regional Operational Programme, Competitiveness Operational Programme, Operational Programme Human Capital, Large Infrastructure Operational Programme, Operational Programme Administrative

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Capacity, Operational Programme Technical Assistance, Operational Programme Disadvantaged Human Resources;

- National Plan for RDI 2014-2020;
- Multiannual plan for the timely collection and aggregation of data to assess the effectiveness and impact of programmes;
- South-East Regional Development Plan 2014-2020.

Chapter I. Analysis of the regional context and the innovation potential of the South-East Region

1.1 Regional assets - technological infrastructures

a) The Economic context of the South-East Region

Studying the economic context of the South-East Region aims at carrying out a comprehensive analysis of the socio-economic development level of the region, which will position the region in relation to the other development regions and identify a first set of competitive advantages available to it.

In order to characterize the South-East Region, it is necessary to analyze the regional economic performance based on indicators such as: regional gross domestic product, regional gross domestic product per capita, gross added value by sectors. Based on the analysis of the economic indicators, the South-East Region registered a positive evolution, although it is below the national average.

Regional GDP

At the level of the South-East Development Region, the Gross Domestic Product (GDP), expressed in millions RON, was 75.239,3 million RON in 2014, which represents 11.26% of Romania's GDP and about 0.12% EU 28's GDP¹.

Analyzing the data from the following graphs and tables, it can be noticed that the evolution of the Gross Domestic Product in the South-East Region in 2010-2015 shows an upward trend. The evolution of this indicator over the analyzed time horizon shows an increase of approximately 24% between 2010 and 2015. This positive trend coincides with the national and European trend and can be explained by the economic recovery registered after the financial crisis.

Carrying out a comparative analysis between the development regions, significant disparities can be noticed. The South-East Region is ranked the fourth in terms of regional GDP, the level recorded in 2014 being 2,3 times lower than the GDP of Bucharest-Ilfov Region, the most developed one among the eight regions of the country.

¹ Please note that it could not be made a comparative analysis between the regional and the national/European GDP fin 2015, as there is no data available at regional and county level for 2015.

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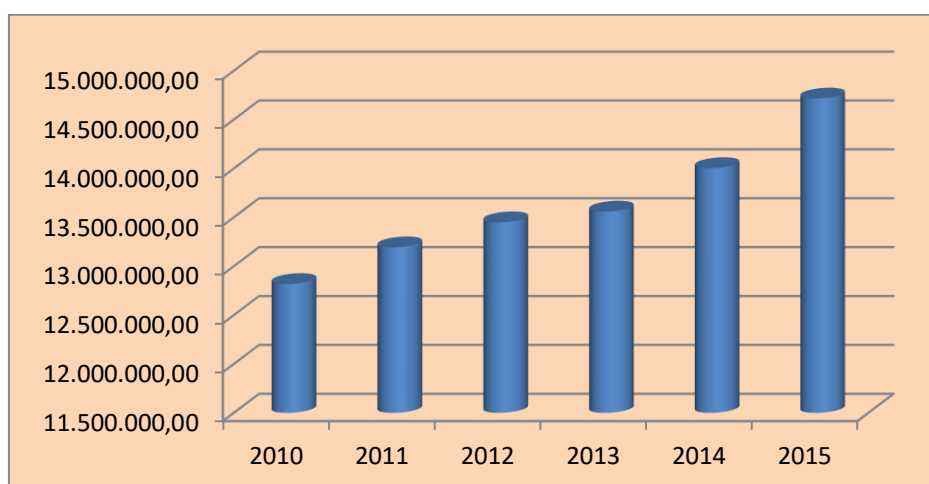
At county level, the highest value of Gross Domestic Product is registered in Constanta, followed on a significant distance by Galati and Braila. On the opposite side, Tulcea and Vrancea counties show the lowest GDP values, with a share of only 6,84% and 8,96% out of the total GDP recorded in the South-East Region in 2014. However, at the level of all six counties of the South-East Region, it is noted that the GDP has experienced relatively upward developments over the analyzed period.

Carrying out a temporal analysis, it can be noticed that during the period 2010-2015, Constanța County recorded the most significant increase in terms of gross domestic product (almost 1,59 times) followed by Buzău County (increase of 1,20 times) and Brăila County (increase of 1,17 times).

Related to the causes that generated the GDP increase during the analyzed period, in Constanta County it is known that infrastructure investments contribute to economic growth, and Constanta is the only strong economic center linked to a continental motorway to Bucharest (the most important pole of economic development). Another reason for this development is the relationship between GDP and growth in consumption, investment and net exports (exports - imports). On the other hand, Tulcea County, which shows the lowest GDP value in the region, is characterized by a lower degree of investment and economic activity, which is justified by the specificity of the geographical features of this county, which has large protected areas with a high biodiversity.

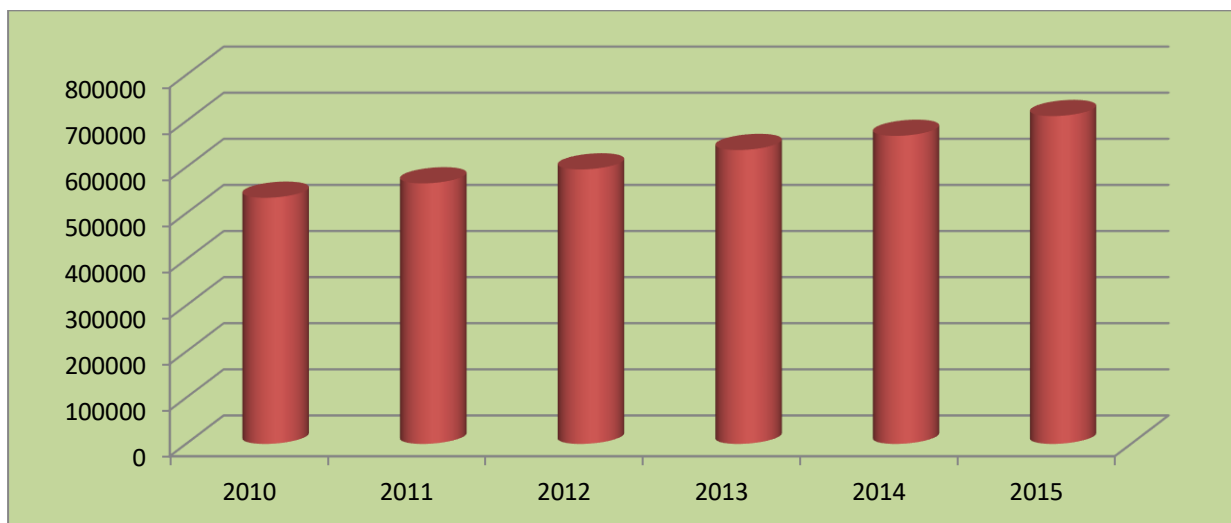
Figure no. 1 Gross Domestic Product at European level 2010-2015 (average level of the Member States of the European Union)

- million euros-



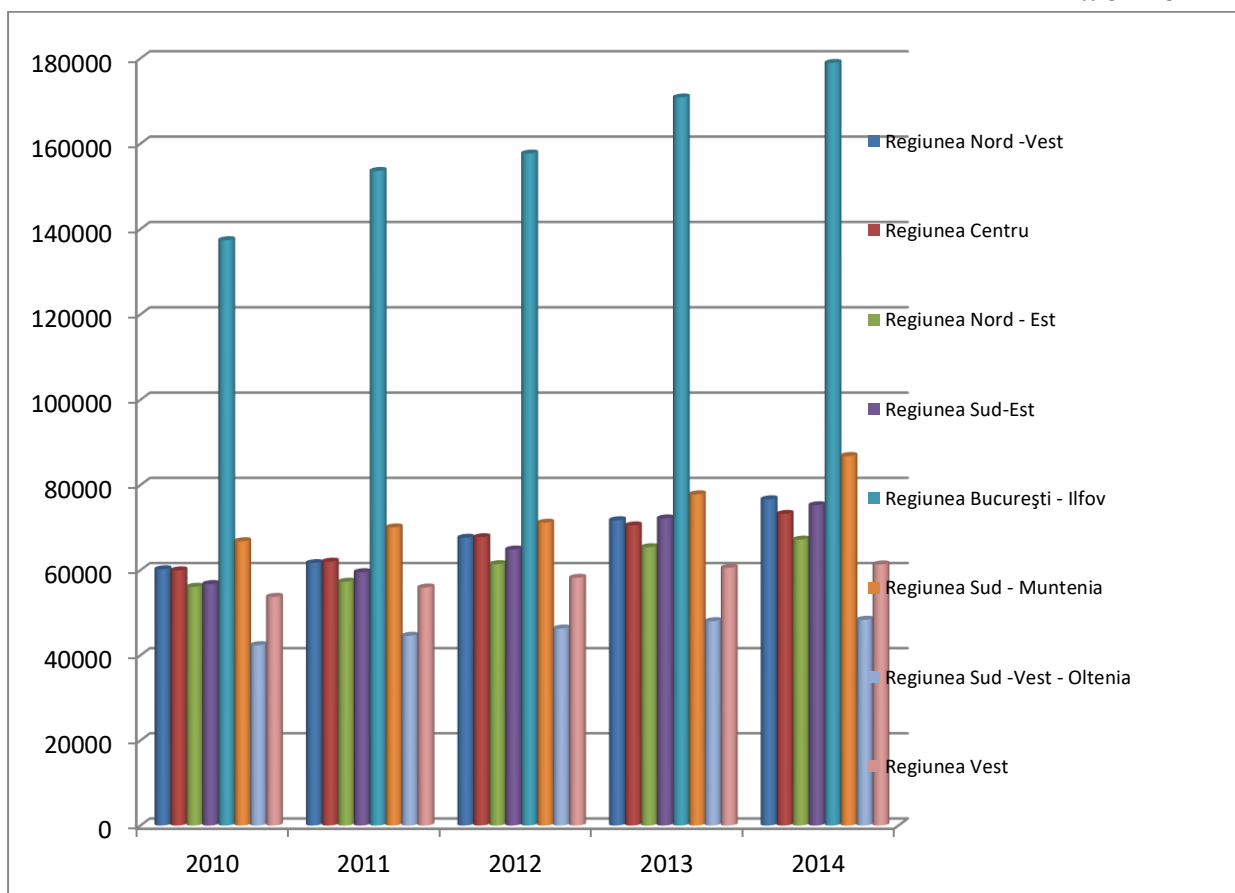
Source: processed data from Eurostat 2017

Figure no. 2 Gross Domestic Product at national level (2010-2015)
-million lei -



Source: processed data from Eurostat 2017

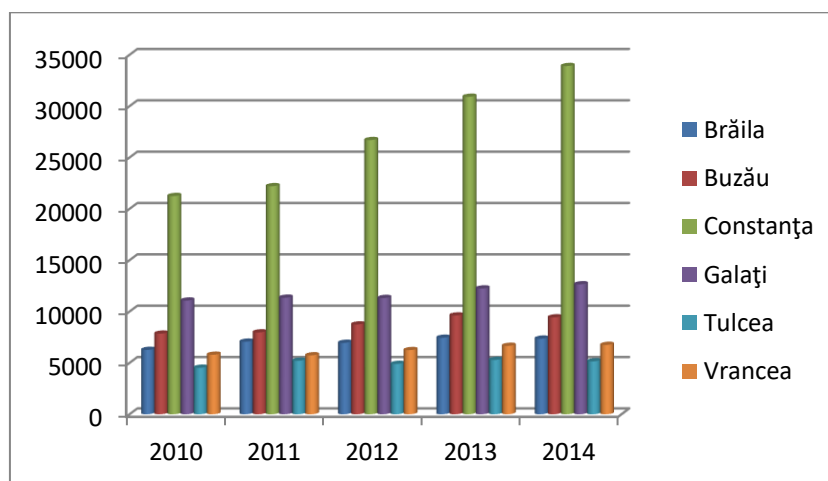
Figure no. 3 Gross Domestic Product at regional level (2010-2014)
-million Ron -



Source: processed data from the National Institute of Statistics 2017

Figure no. 4 Gross Domestic Product at county level (2010-2014)

- million Ron -



Source: processed data from the National Institute of Statistics 2017

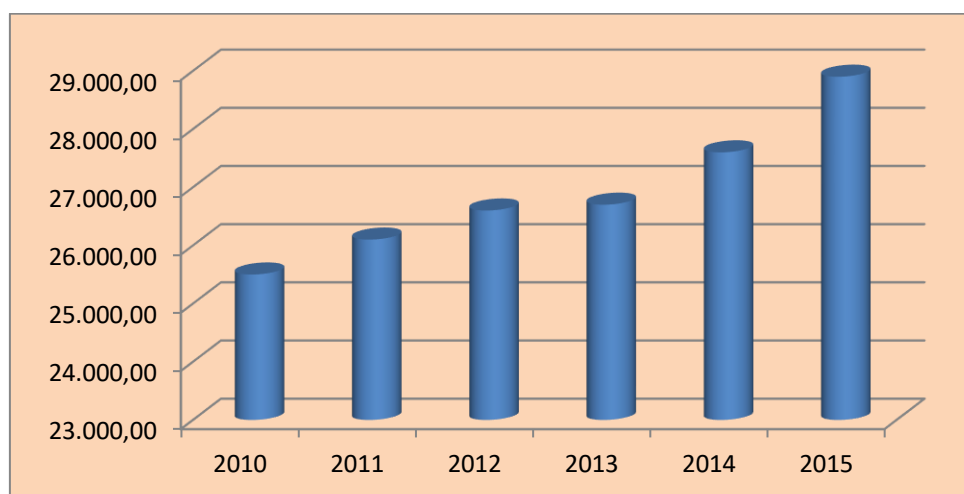
Regional GDP per capita

The South-East Development Region records the fourth value in terms of regional GDP per capita within the national average of 2015, being surpassed by regions Bucharest-Ilfov, West and Centre, fact that gives a significant degree of competitiveness to the region. Thus, the regional GDP per inhabitant in the South-East Region represents 88,8% of the national average GDP per capita.

Moreover, as it can be seen from the charts below, the value of the Gross Domestic Product per capita at regional level has registered positive dynamics during 2010-2015, fact that coincides with the national and European economic trend.

Figure no. 5 Gross domestic product (GDP) per capita at EU level (2010-2015)

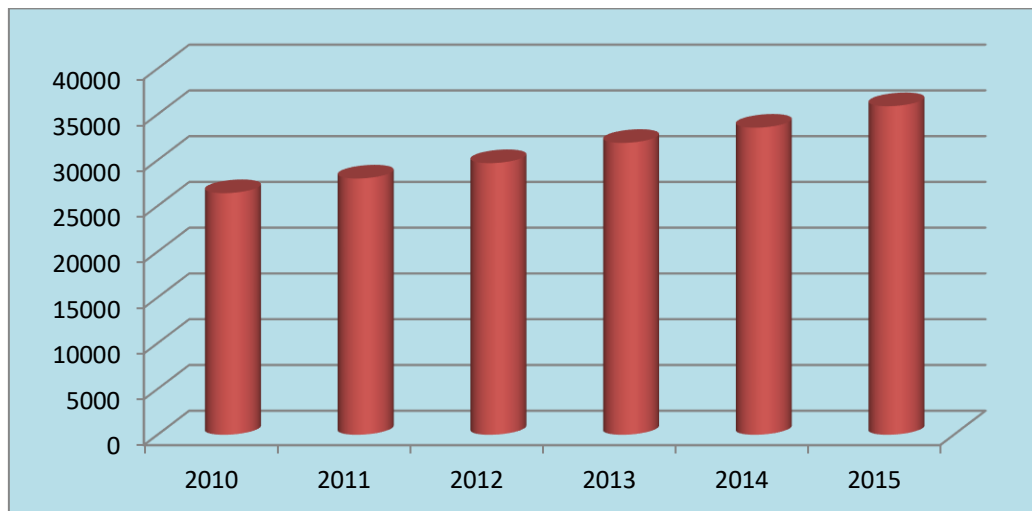
- million euro -



Source: processed data from Eurostat 2017

Figure no. 6 Gross domestic product (GDP) per capita at national level in 2010-2015, in current prices - calculated according to NACE Rev.2 -SEC 2010

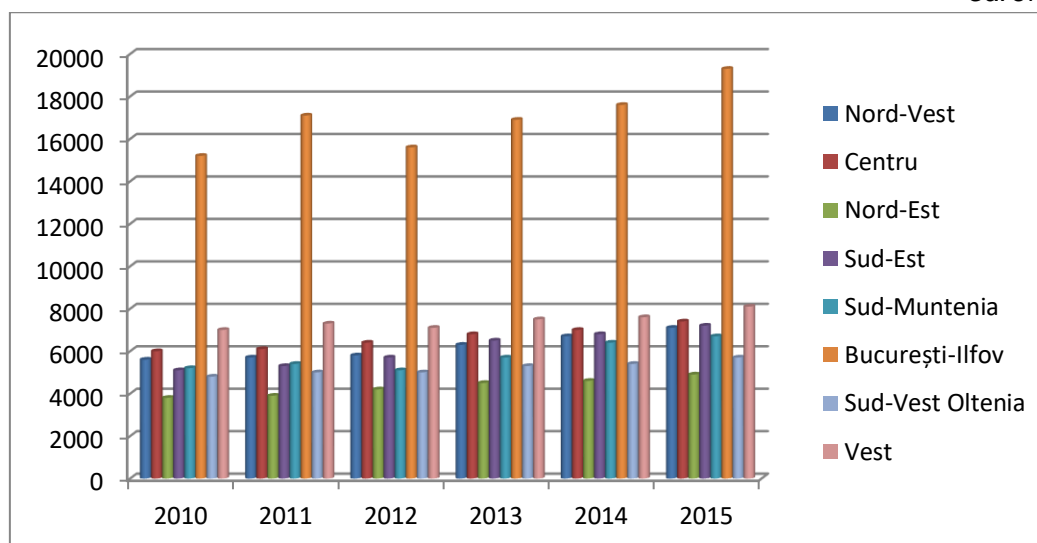
-Ron-



Source: processed data from the National Institute of Statistics 2017

Figure no. 7 Evolution of GDP / capita at regional level in 2010-2015

-euro/capita-



Source: processed data from Eurostat 2017

Gross value added

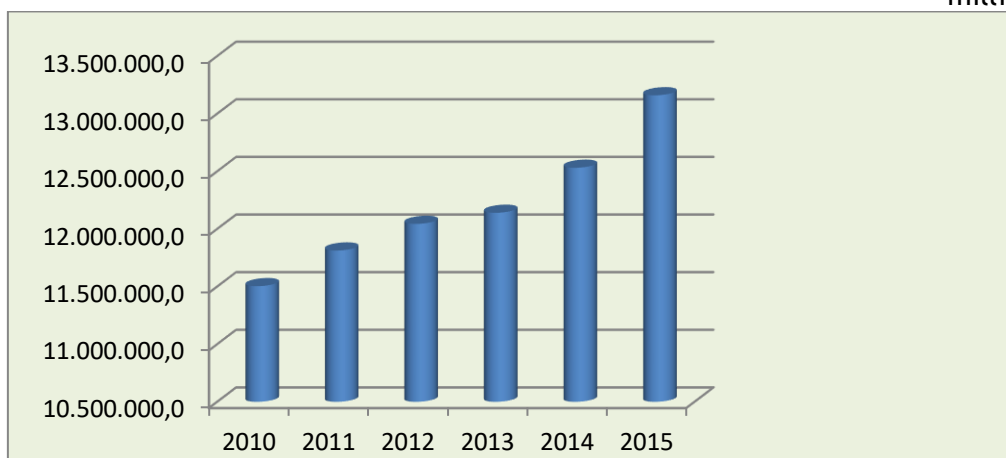
- **Gross Value Added (GVA)** represents the balance of the production account and is measured as the difference between the value of produced goods and services (valued at basic prices) and intermediate consumption (measured at purchaser's prices), thus representing the new value created in the production process. GAV is calculated before the consumption of fixed capital is calculated.

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The gross added value at EU level has recorded an upward trend throughout the analyzed period, this indicator increasing by 12,58% in 2015 compared to 2010.

Figure no. 8 Evolution of GVA at European level, 2010-2015

- million euro-

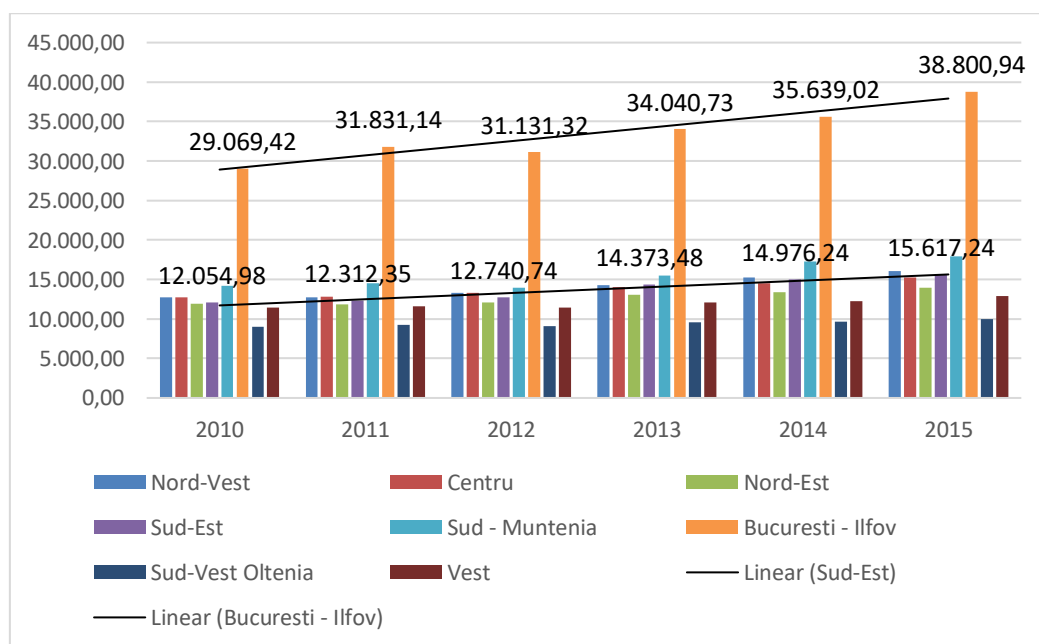


Source: processed data from Eurostat 2017

The evolution of GVA at the level of the South-East Region shows an upward trend, from 12.054,98 million in 2010 to 15.617,24 million in 2015. During the whole analyzed timeframe, the share of regional GVA out of the national GVA remained relatively constant - around of 11%.

Figure no. 9 Evolution of regional GVA, Romania, 2010-2015

- million euros -



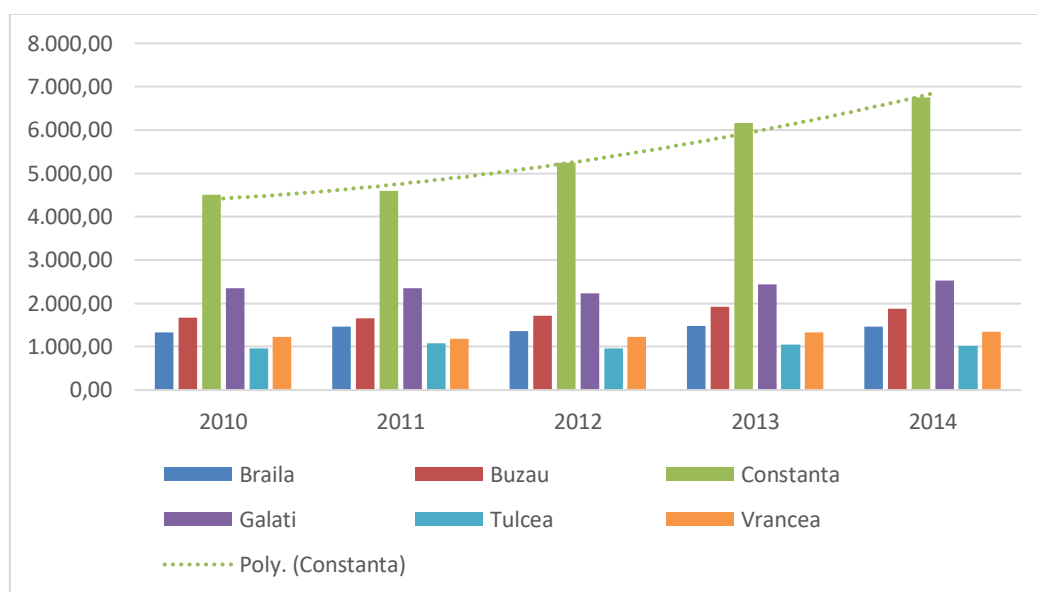
Source: processed data from Eurostat 2017

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As can be seen from the figure above, the trend of the indicator in the South-East Region is increasing. GVA increased from 12.054,98 million euros in 2010 to 15.617,24 million euros in 2015. The value of the indicator is below the one registered in Bucharest-Ilfov region, this one being clearly superior to all other regions.

At county level, the available data stop at 2014. The evolution of the GVA at the level of each county, over the analyzed period, is illustrated in the figure below.

Figure no. 10 Evolution of GVA at county level, 2010-2014
- million euros -



Source: data processed from Eurostat 2017

Within the South-East Region, Constanta County surpasses with a significant difference the other counties, the trend of the indicator being positive, from 4,503.37 million in 2010 to 6.751,18 million in 2014. The factors that contributed the most to increasing GDP values at regional level, in Constanta, were the existence of a highly developed economic sector, the increase of the activity of local companies and the creation of new companies in the county, the development of the county as a result of attracting European funds, foreign investments and development of cross-border partnerships. Tulcea is the county that records the lowest values among the constituent counties of the region, due to the specificity of this county, which, although stretched out, presents particularities that reduce the economic activity in a and concentrate it in a small area, compared to the other counties.

GVA by sector

The sectors with the largest contribution to GVA at national level in 2015 are industry (excluding construction) with a contribution of 27,1% followed by wholesale, retail,

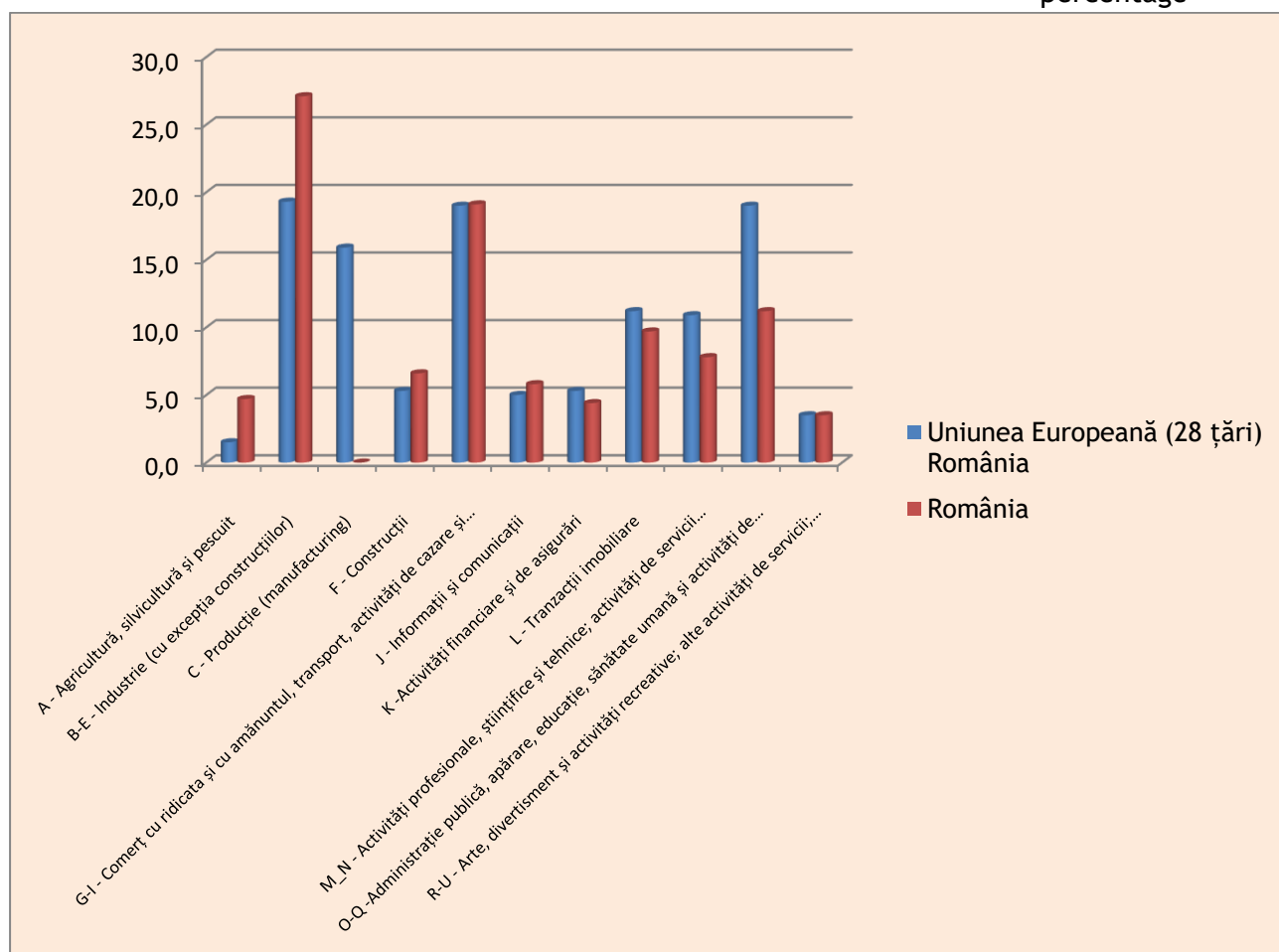
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transport, accommodation and restoration activities (19, 1%) and real estate transactions (9,7%). On the opposite side, the sector with the lowest contribution to the formation of gross added value is arts, entertainment and recreation, other service activities, household and extra-territorial organizations and bodies (3,5%) and manufacturing for which there is no recorded data.

Compared with the European average, the situation in Romania shows the same evolution from the point of view of the contribution of the industry sector to the formation of the gross added value (the largest share), but has a considerable gap in the contribution of the production sector (EU- has a contribution of 15,9%). The rest of the sectors have a relatively similar evolution, with lower values recorded by Romania than the European average.

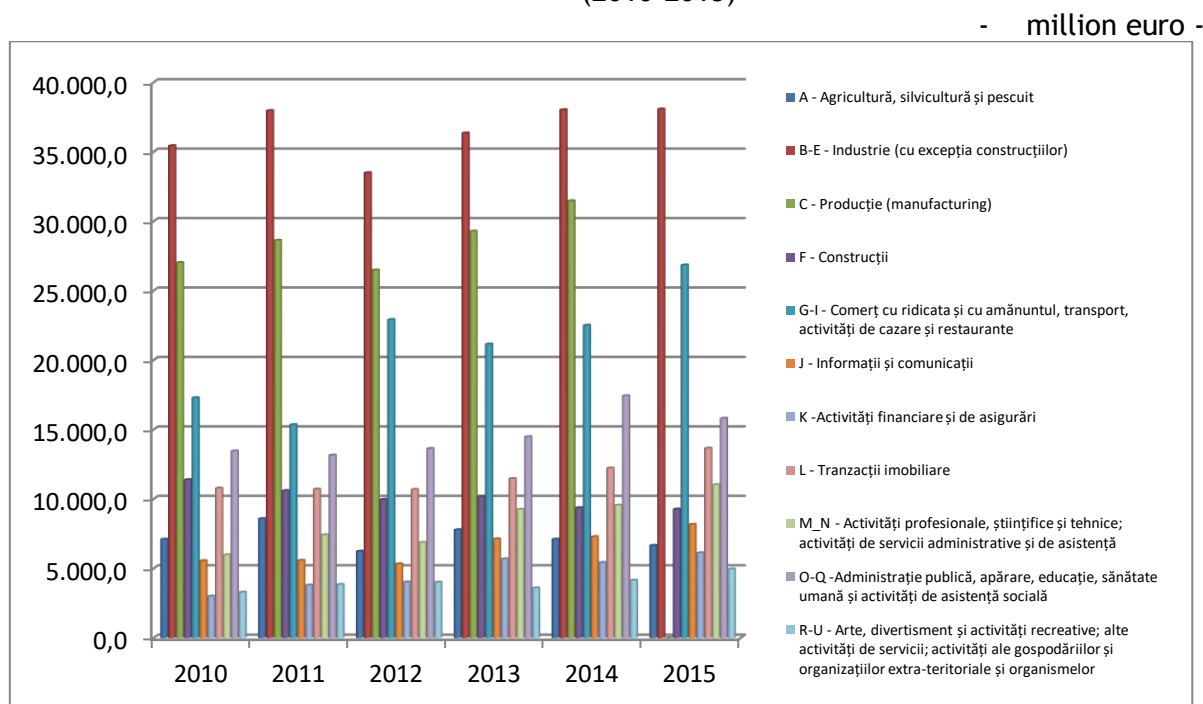
Figure no. 11 Gross Value Added by Sector - percentage out of total, situation at European and national level (NACE Rev. 2) (2015)

- percentage -



Source: processed data from Eurostat 2015

Figure no. 12 Gross value added by sectors - current prices at national level (NACE Rev. 2) (2010-2015)



Source: processed data from Eurostat 2015

From the point of view of the sectors with the highest share of gross value added, the South-East Region has similar developments with the South-Muntenia Region (industry, agriculture, construction and real estate), North-West (production) East (commerce) regions.

Analyzing the previous charts, it is noted that at the level of all 6 counties of the region, the sectors with the most significant contribution to GVA are industry, production and agriculture. Constanta county has the highest values in the region for all sectors of activity, while the lowest values are recorded in the Vrancea and Tulcea counties.

There are a number of factors that rank Constanta County first in terms of the analyzed indicator, such as the fact that this county is very well connected from the point of view of the existing transport infrastructure (the existence of the motorway linking this county with the capital of the country, the existence of a sea harbor), the fact that the area has increased attractiveness for foreign direct investment, as well as the fact that there is an increased capacity to attract European funds and to implement projects that have had the role of developing this county very much. On the other hand, Tulcea County has lower values for this indicator, due to objective factors affecting the economic development of this county: poor transport infrastructure (both road and naval) and the existence of some

large water-covered and protected areas that limit the development of business in the territory of this county.

b) Labor force in the South-East Region

The labor force provides relevant information regarding the potential for economic development, the economic attractiveness of the South-East Region, its economic and social development level, etc.

In the analysis of the labor force at regional level, there were considered the essential elements of the labor force dynamics which influence labor productivity and the attractiveness for investments, such as: the employed population and number, number of unemployed persons, aspects related to the level of education of the population, etc.

Employment rate by age groups, residence areas and gender (by counties)

The employment rate is the share of the employed population in the age group x from the total population of the same age group x.

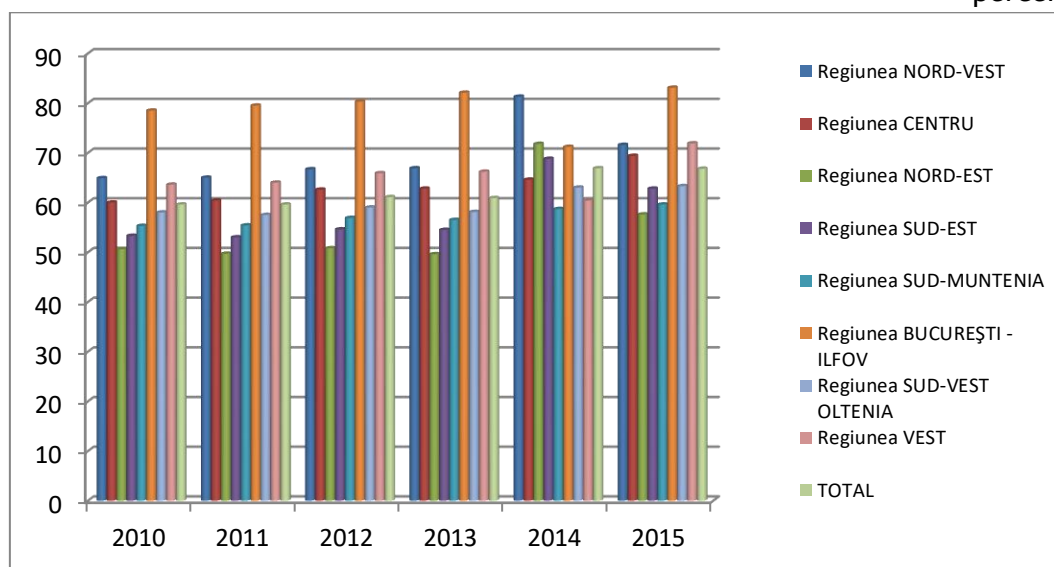
The employment rate at the national level was 66.8% in 2015, decreasing by 0.1% compared to 2014. During the period 2010-2014, the employment rate experienced a sustained rise period, going from 59.6% in 2010 to 66.9% in 2014.

The region with the highest employment rate was the Bucharest-Ilfov Region (83.1%), due to the increased attractiveness of this region for the labor force across the country. The South-East Region ranks sixth in 2015 in terms of employment rate (62.8%), registering higher values only compared to the North-East (57.6%) and South Muntenia (59.6%) regions. Also, over the analyzed period, the employment rate in the South-East Region showed the same positive trend registered at national level, increasing by 9.5 percent in 2015 compared to 2010.

The evolution of the indicator is illustrated in the chart below.

Figure no. 13 Employment rate by development regions (2010-2015)

- percentage -

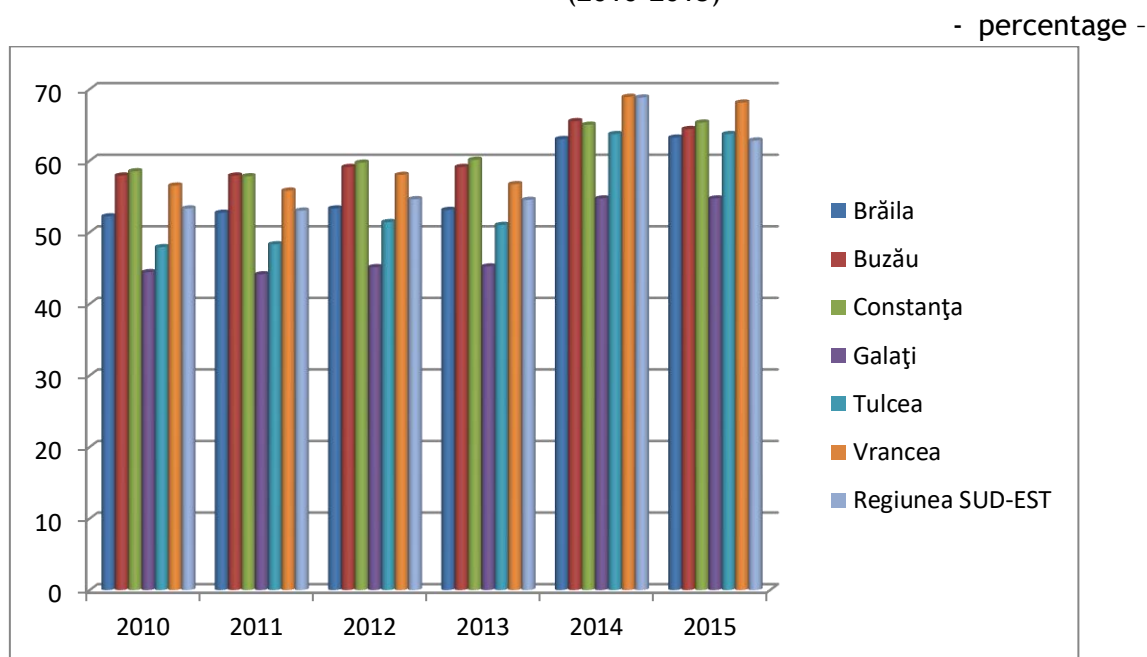


Source: Data processed from the National Institute of Statistics, 2017

Analyzing the evolution of the employment rate at the level of the counties of the South-East Region, it is noted that it kept the same upward trend during 2010-2015. The county with the highest occupancy rate recorded in 2015 is Vrancea (68.1%), while the lowest occupancy rate is recorded in Galati (54.7%). It is also worth mentioning the considerable increase of this indicator in Tulcea (15.8% increase compared to 2010), Vrancea (11.6% increase) and Braila (11% increase) counties.

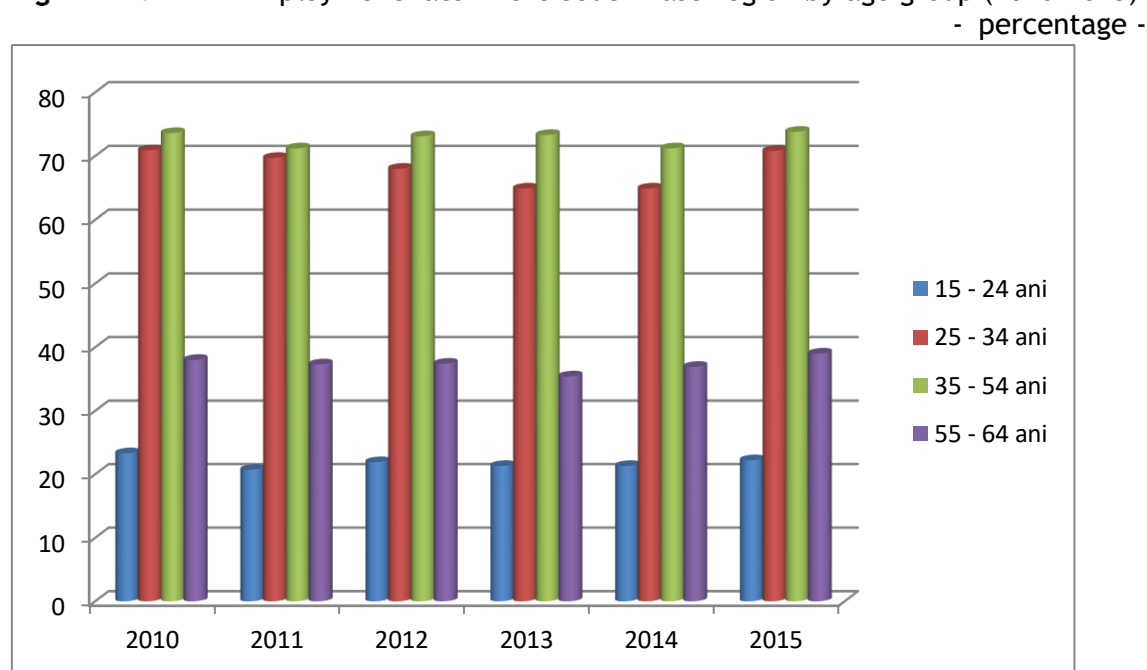
An important factor that has contributed to the increase of the employment rate in Vrancea county is related to the number of local active units in the county, which has increased during 2010-2015, especially on the SME segment. The counties where the employment rate is lower (although increased compared to 2010), these are those where the economic activity is lower or which are predominantly oriented towards a single economic branch (for example, Galati county).

Figure no. 14 Employment rate of labor resources of the South-East Region per counties (2010-2015)



Source: data processed from the National Institute of Statistics, 2017

Figure no. 15 Employment rate in the South-East Region by age group (2010-2015)



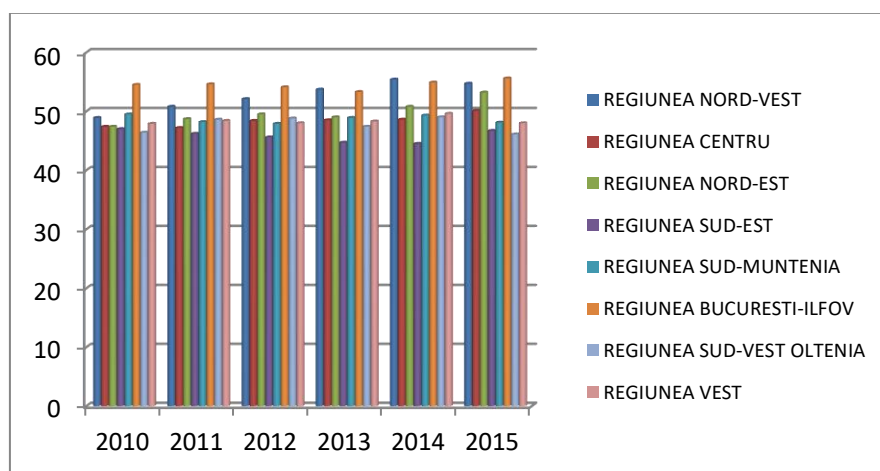
Source: data processed from the National Institute of Statistics, 2017

An analysis of the employment rate of labor resources in the South-East Region, by age group, shows that the persons aged 35-54 has the highest employment rate (73.8% in 2015), closely followed by the persons aged 25-34, with 70.8% in 2015, these two

categories being practically the most active segment of the employed population both at regional level and national and European levels.

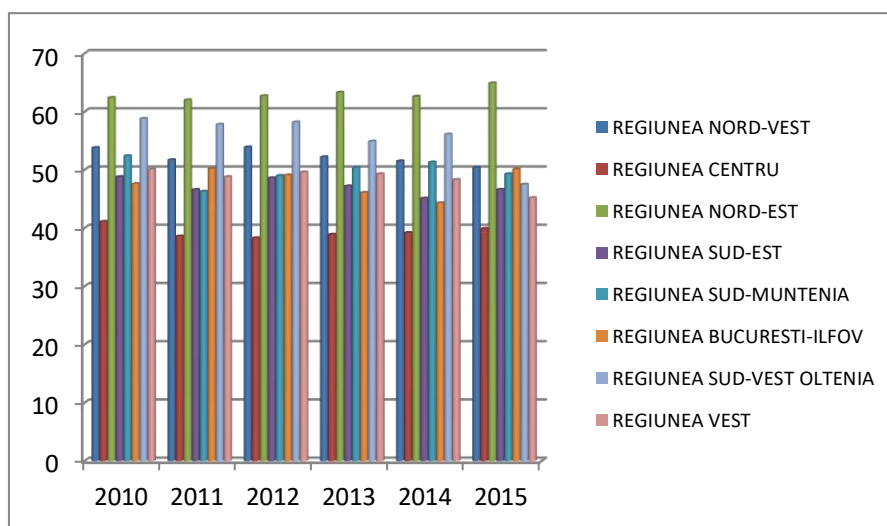
In terms of residence, urban and rural employment rates are similar in the South-East Region, with 46.7% employment rate in urban areas and 46 .6% employment rate in rural areas.

Figure no. 16 Employment rate at regional level in urban areas (2010-2015)
- percentage -



Source: data processed from the National Institute of Statistics, 2017

Figure no. 17 Employment rate at regional level in rural areas (2010-2015)
- percentage -



Source: data processed from the National Institute of Statistics, 2017

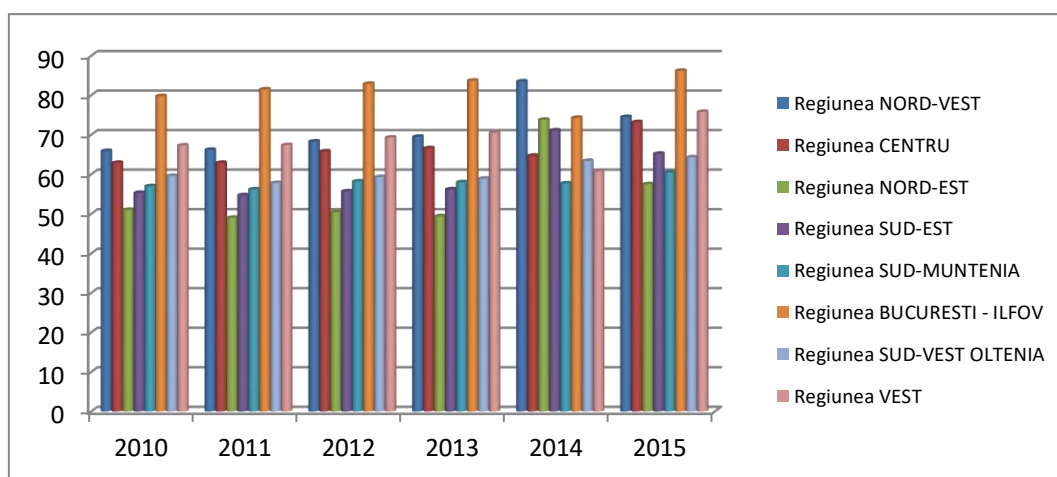
From the perspective of the employment rate by gender, it is generally observed that, excepting the North-East Region, all other regions have a higher employment rate among the male population. In 2015, men's employment rate in the South-East Region was 65.2%,

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while women's employment rate was 60.2%. From a timely perspective, the employment rate among the male population increased by 9.9% in 2015 compared to 2010, and among the female population the employment rate increased by 9.5% over the same period.

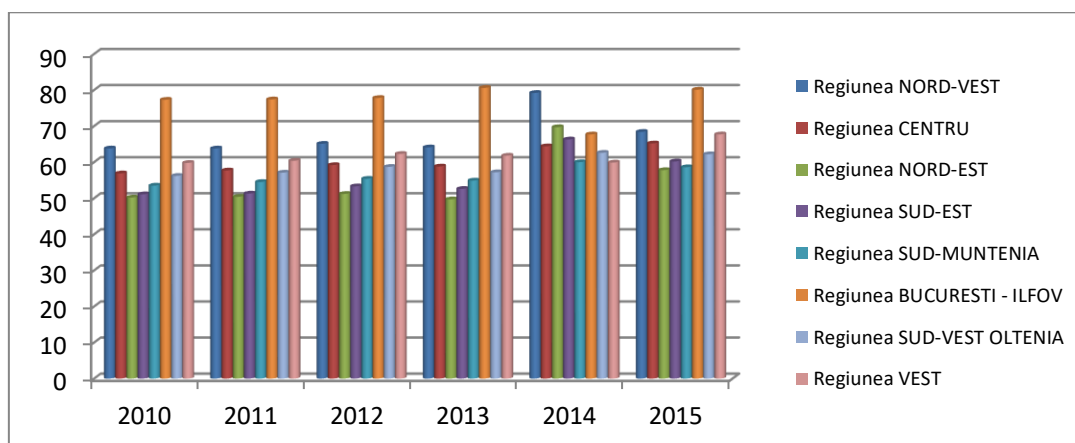
The existence of a higher employment rate among men than women was also noted at the level of the counties of the South-East Region, with some exceptions: in 2015, Vrancea county had a higher value of the occupancy rate among the female population (68.9%) compared to the male population (67.4%). The same trend is noticed at the level of Tulcea county (in 2013 the employed female population was with 1.4 percent higher than the male population), as well as in Braila, where in 2014 the two groups registered the same employment rate (63% of for male population and 63% for the female population).

Figure no. 18 Employment rate at regional level, male population (2010-2015)
- percentage -



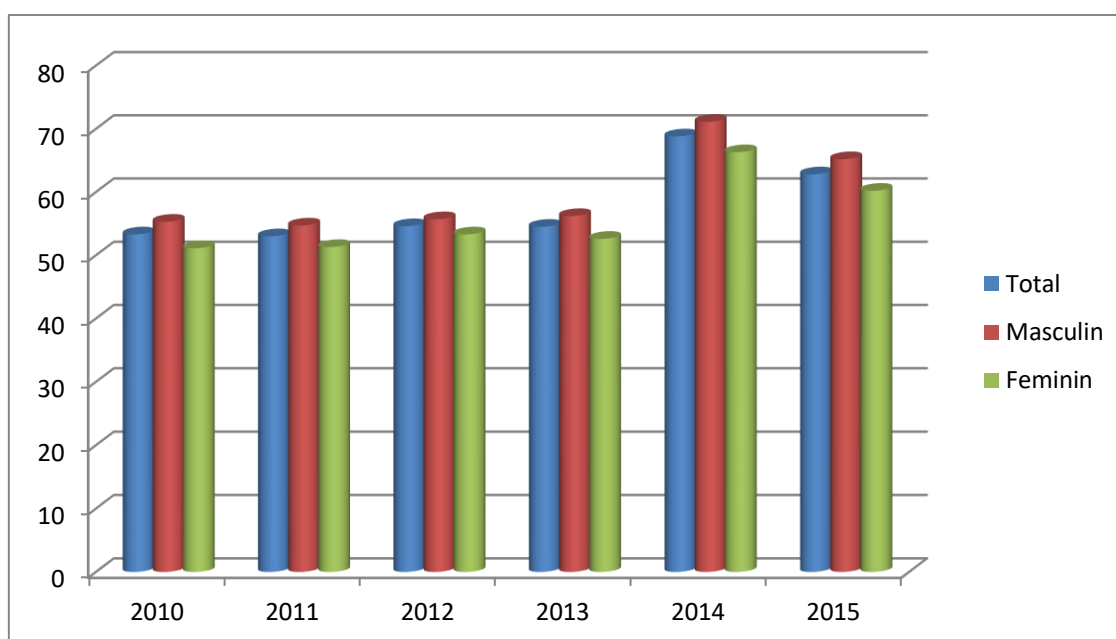
Source: data processed from the National Institute of Statistics, 2017

Figure no. 19 Employment rate at regional level, female population (2010-2015)
- percentage -



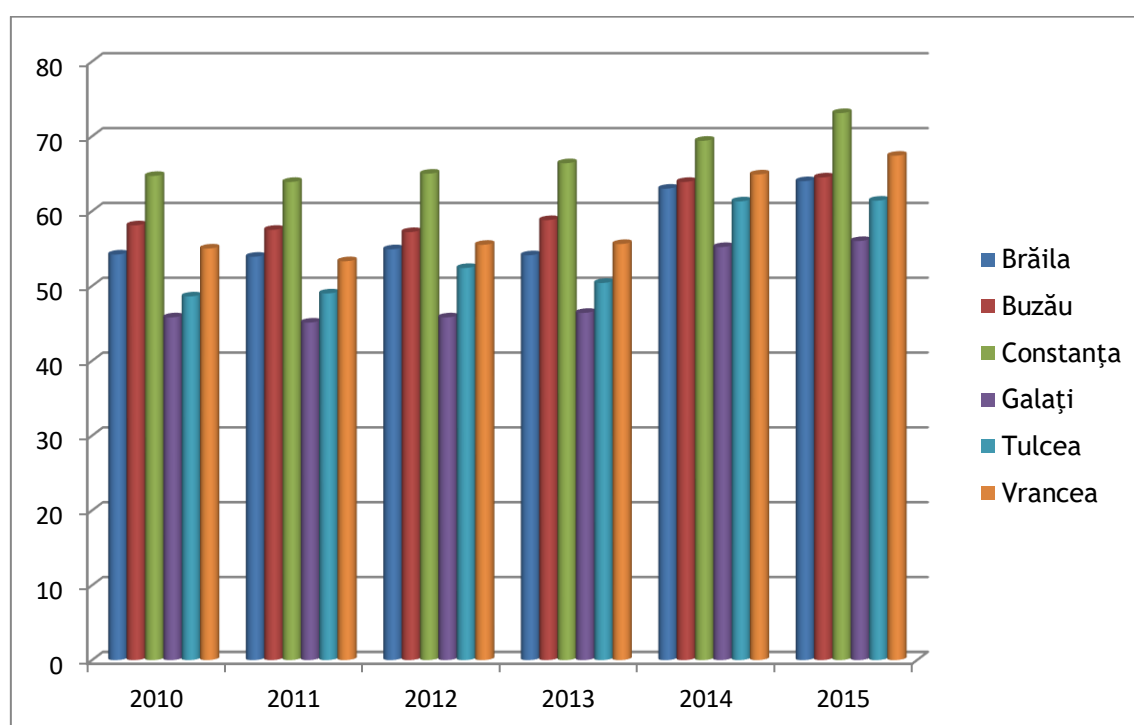
Source: data processed from the National Institute of Statistics, 2017

Figure no. 20 Employment rate at regional level, by gender (2010-2015)
- percentage -



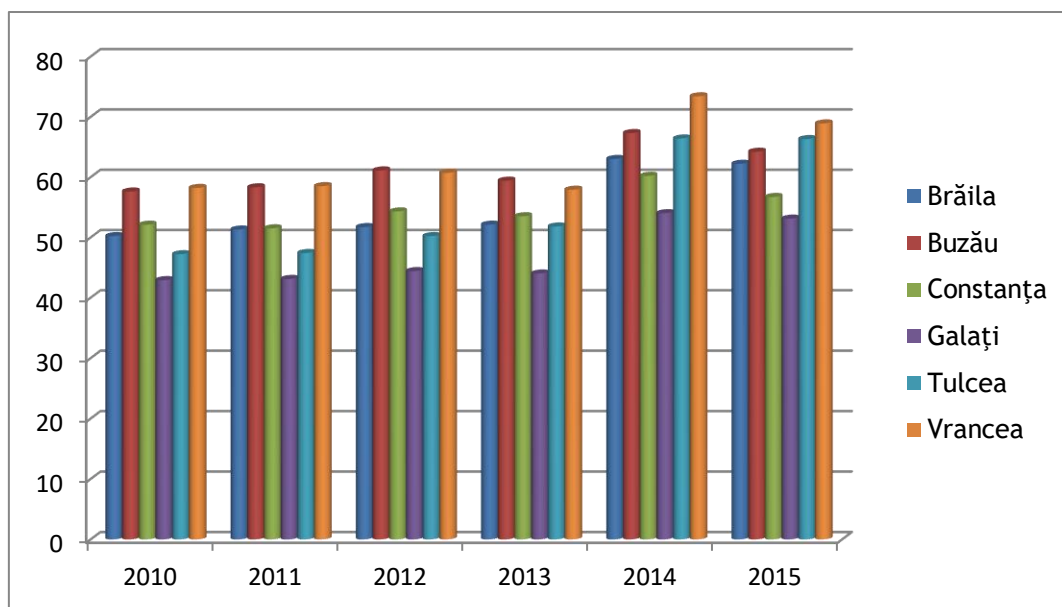
Source: data processed from the National Institute of Statistics, 2017

Figure no. 21 Employment rate at county level, male population (2010-2015)
- percentage -



Source: data processed from the National Institute of Statistics, 2017

Figure no. 22 Employment rate at regional level, female population (2010-2015)
- percentage -



Source: data processed from the National Institute of Statistics, 2017

Employment rate in Romania compared to other EU Member States

Considering the employment in Romania in 2015 (66%), it represents 94.15% of the average employment rate registered in the 28-member states of the European Union. The dynamic of this indicator in the period 2010-2015 reveals slightly upward fluctuations, which led to a 1.2 relative increase in 2015 compared to 2010. Also at European level, the relative increase of the employment rate had a similar value, with a 1.5% increase over the period under review, even if the occupancy rate had a steady value during the period 2010-2013.

In comparison with other EU Member States, Romania is ranked, in terms of the employment rate, in similar ranks with Belgium, Bulgaria, Cyprus, Malta, Poland and Slovakia.

Table no. 1 Employment rate in the Member States of the European Union
- percentage -

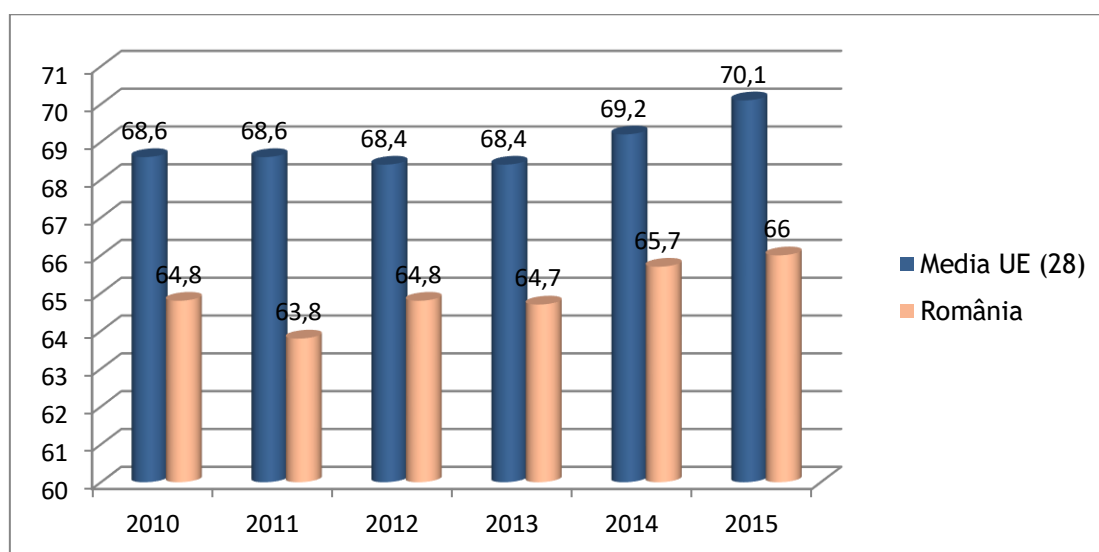
	2010	2011	2012	2013	2014	2015
EU Member States (28)	68,6	68,6	68,4	68,4	69,2	70,1
Belgium	67,6	67,3	67,2	67,2	67,3	67,2
Bulgaria	64,7	62,9	63	63,5	65,1	67,1
Czech Republic	70,4	70,9	71,5	72,5	73,5	74,8
Denmark	75,8	75,7	75,4	75,6	75,9	76,5
Germany	75	76,5	76,9	77,3	77,7	78
Estonia	66,8	70,6	72,2	73,3	74,3	76,5
Ireland	64,6	63,8	63,7	65,5	67	68,7

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	2010	2011	2012	2013	2014	2015
Greece	63,8	59,6	55	52,9	53,3	54,9
Spain	62,8	62	59,6	58,6	59,9	62
France	N.A	N.A	N.A	N.A	69,3	69,5
Croatia	62,1	59,8	58,1	57,2	59,2	60,5
Italy	61	61	60,9	59,7	59,9	60,5
Cyprus	75	73,4	70,2	67,2	67,6	67,9
Latvia	64,3	66,3	68,1	69,7	70,7	72,5
Lithuania	64,3	66,9	68,5	69,9	71,8	73,3
Luxembourg	70,7	70,1	71,4	71,1	72,1	70,9
Hungary	59,9	60,4	61,6	63	66,7	68,9
Malta	60,1	61,6	63,1	64,8	66,4	67,8
Netherlands	76,8	76,4	76,6	75,9	75,4	76,4
Austria	73,9	74,2	74,4	74,6	74,2	74,3
Poland	64,3	64,5	64,7	64,9	66,5	67,8
Portugal	70,3	68,8	66,3	65,4	67,6	69,1
Romania	64,8	63,8	64,8	64,7	65,7	66
Slovenia	70,3	68,4	68,3	67,2	67,7	69,1
Slovakia	64,6	65	65,1	65	65,9	67,7
Finland	73	73,8	74	73,3	73,1	72,9
Sweden	78,1	79,4	79,4	79,8	80	80,5
United Kingdom	73,5	73,5	74,1	74,8	76,2	76,8

Source: Eurostat 2017

Figure no. 23 Employment rate comparison between Romania and EU average
- percentage -



Source: data processed from Eurostat, 2017

Unemployment rate by age, residence, and gender

In 2015, the unemployment rate in Romania was 5%, reduced compared to 2010 when it was registered at 7%. In 2011-2014 it showed slight fluctuations between 5.2% and 5.4%, the lowest value being still recorded in 2015. At national level, the highest unemployment rate was recorded in 2015 in the South-West Oltenia (8.2%) and the South-East (6.6%) and South Muntenia (6.6%) regions and the lowest unemployment rate, below the national average, in Bucharest-Ilfov (1.8%) and West (3%) regions. The lowest unemployment rates in the South-East region were registered in 2011 (6.1%) and 2012 (6.4%).

Within the South-East region, Constanta county had the lowest unemployment rate in 2015, compared to the other counties of the region, with only 3.6%, thus being below the national average. On the opposite, the counties with the highest unemployment rates in the region are Buzau (10%) and Galati (9%). An explanation for this situation is that Constanta is the most economically developed county in the South-East Region (high attractiveness for foreign investors, highest number of active local units, university center and harbor area, the highest absorption rate of European funds in the region), while the Galați and Buzău counties are dependent on certain specific sectors of the economy, which directly influence the unemployment rate.

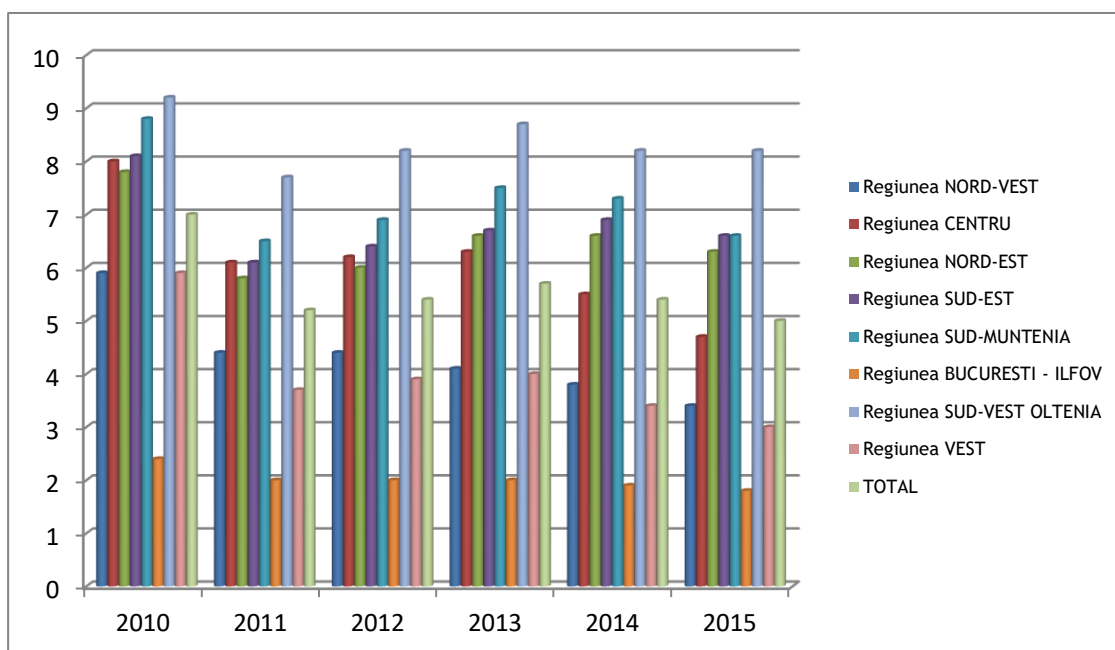
Considering the age groups perspective, the highest unemployment rate in the South-East Region was among the population aged 15-24 (29.3% in 2015), and the lowest was registered among the population aged 55-64 (6.1% in 2015), a trend which is manifested both at national level and at the level of other development regions.

In terms of residence, the rural unemployment rate (7.1% in 2015) was higher than the urban area (7% in the same year). In the South-east Region, the situation is slightly different, in the sense that the urban areas have an unemployment rate (9.8%) higher than the rural areas (8.5%) in 2015.

In all the development regions of Romania, the unemployment rate is higher among men than among women. The same situation is registered for the South-East Region, where the unemployment rate among the male population was 9.8%, while among the female population it was 8.4% in 2015.

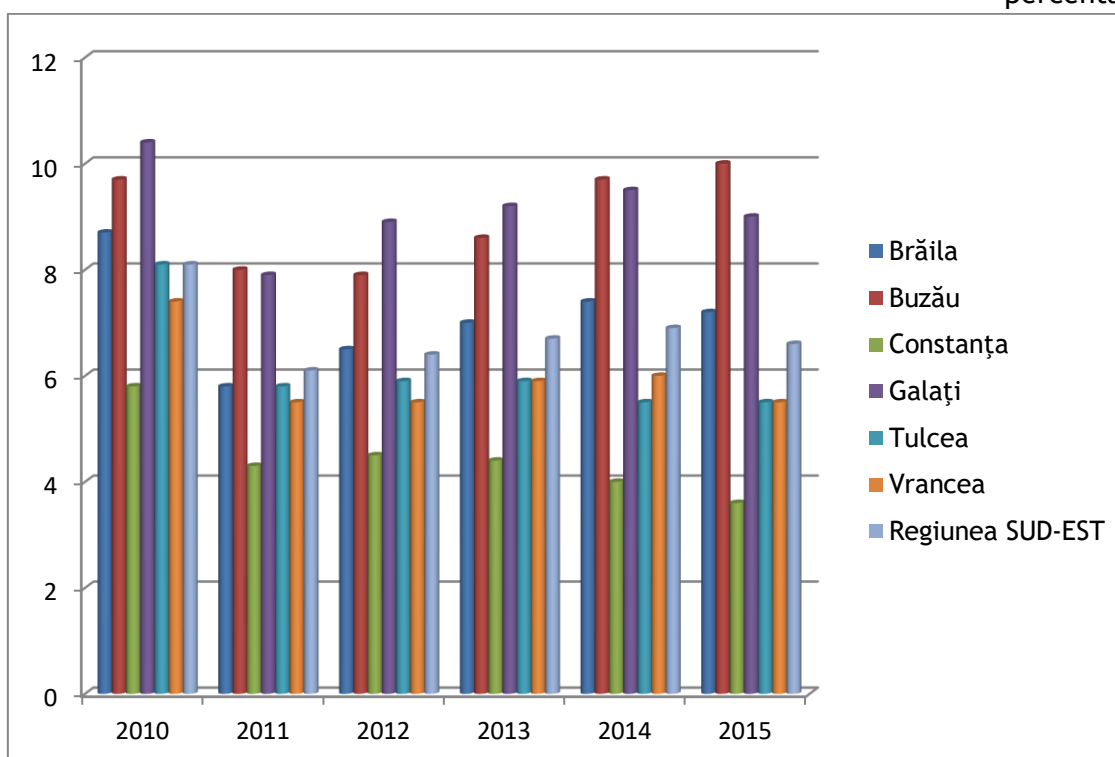
The tendency is also generally maintained at the level of the counties of the South-East Region, with the exception of Constanta County, where the unemployment rate among the male population (2.7%) registered lower values than the one of the female population (4.9%) in 2015.

Figure no. 24 Unemployment rate at regional level (2010-2015)
- percentage -



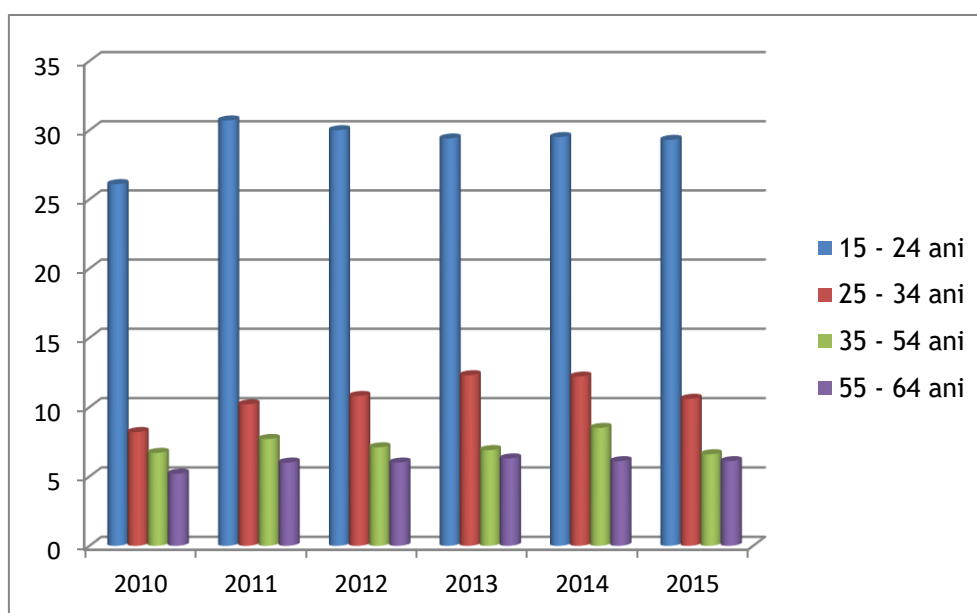
Source: data processed from the National Institute of Statistics, 2017

Figure no. 25 Unemployment rate in South-East Region, by counties (2010-2015)
- percentage -



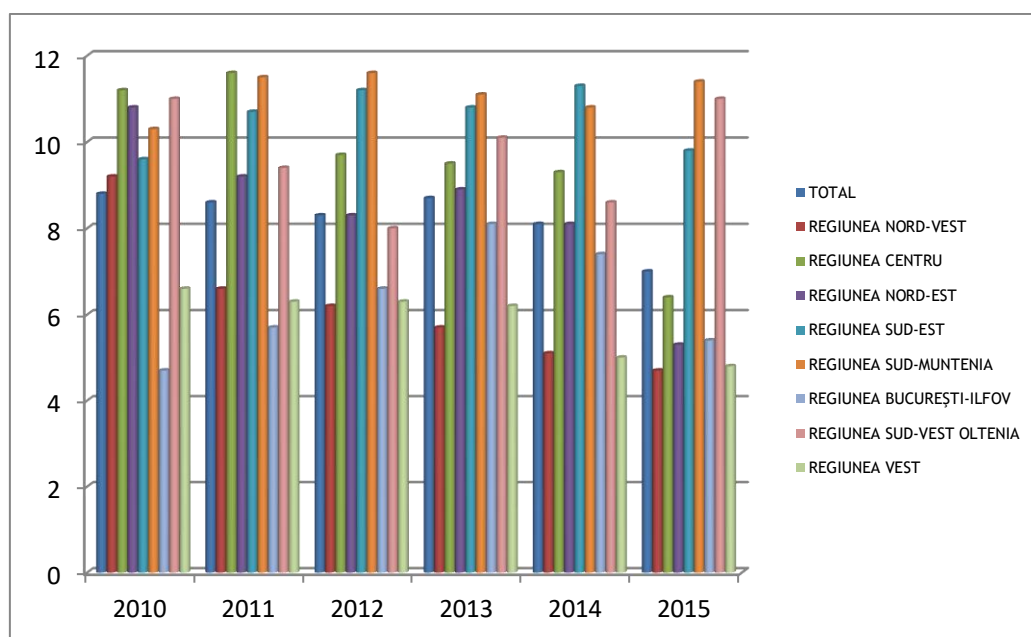
Source: data processed from the National Institute of Statistics, 2017

Figure no. 26 Unemployment rate in South-East Region, by age group (2010-2015)
- percentage -



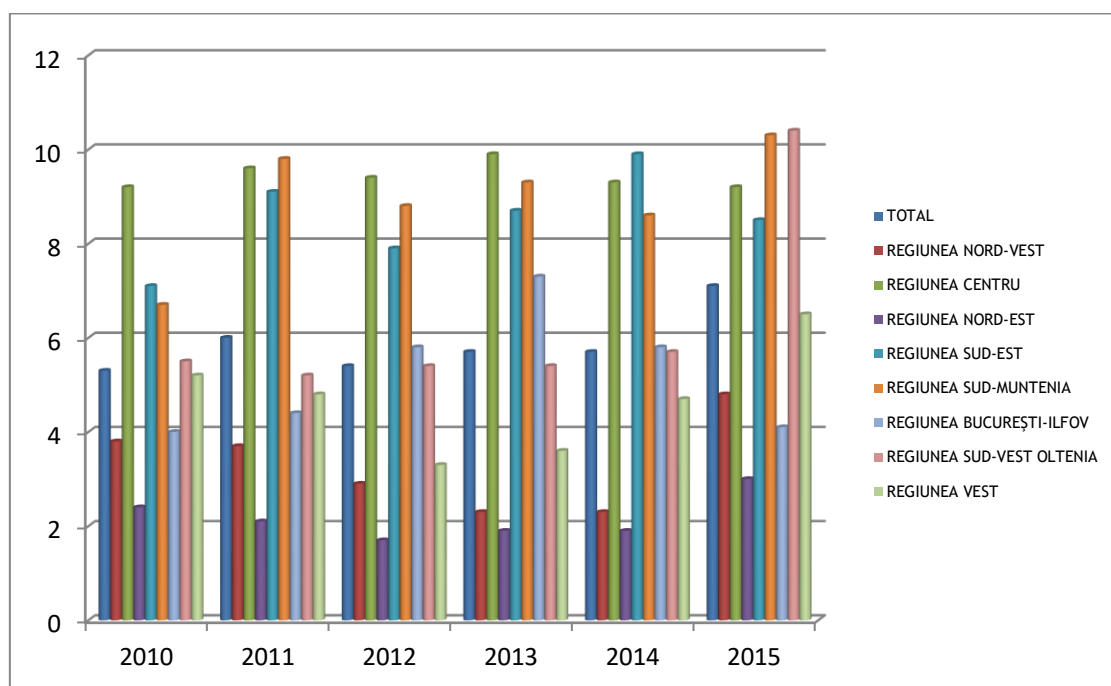
Source: data processed from the National Institute of Statistics, 2017

Figure no. 27 Unemployment rate at regional levels, in urban areas (2010-2015)
- percentage -



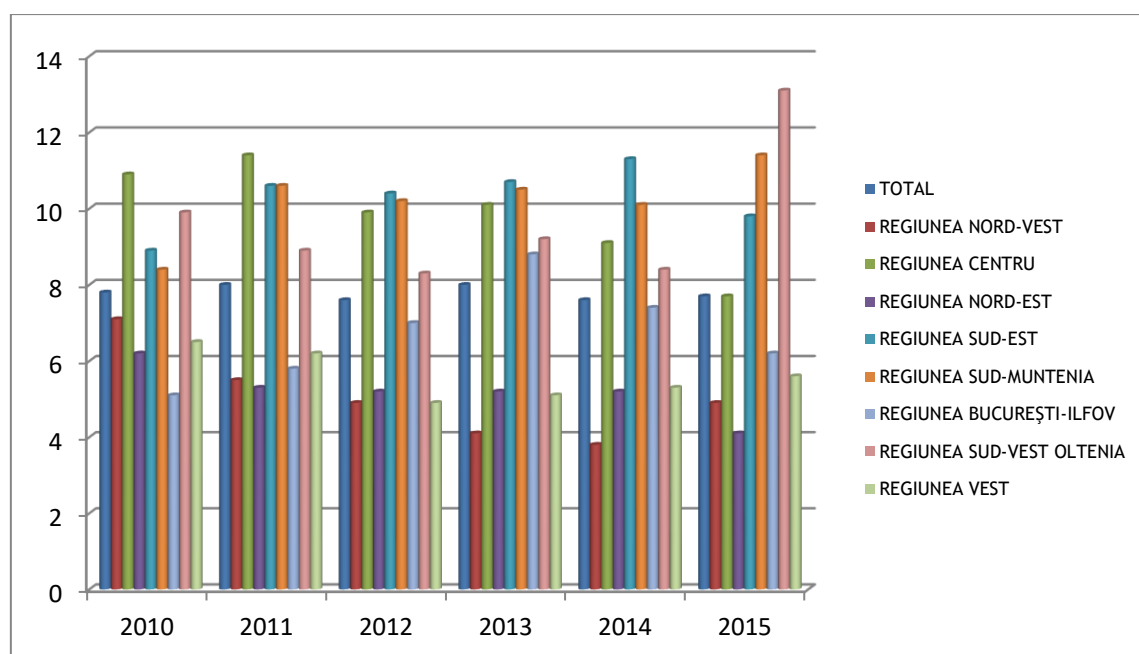
Source: data processed from the National Institute of Statistics, 2017

Figure no. 28 Unemployment rate at regional level, in rural areas (2010-2015)
- percentage -



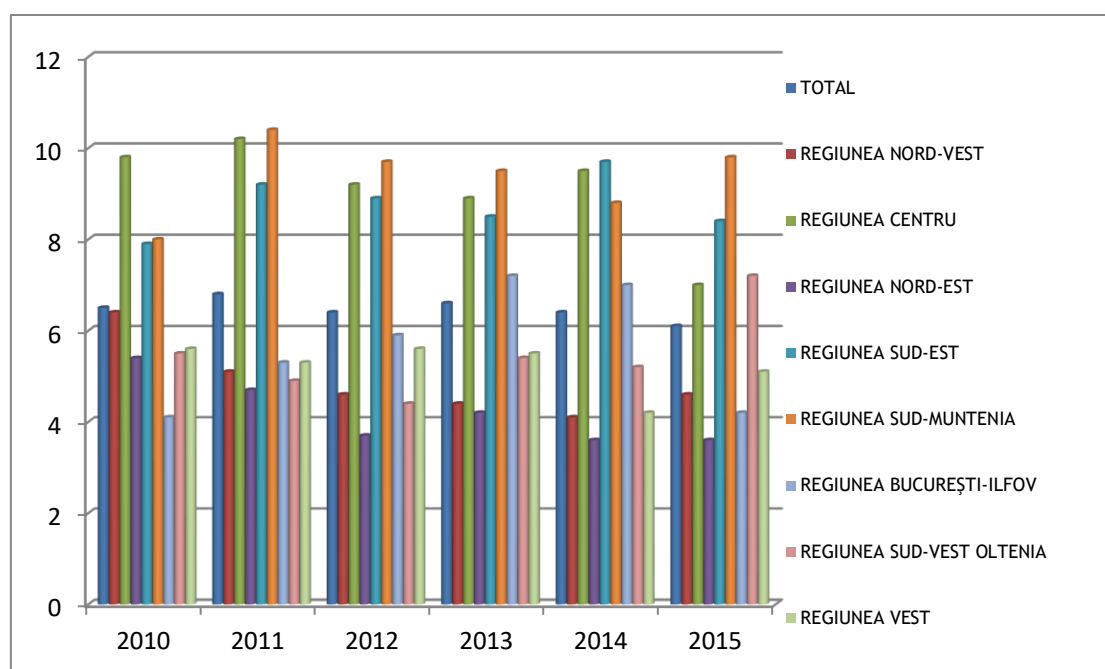
Source: data processed from the National Institute of Statistics, 2017

Figure no. 29 Unemployment rate at regional level, male population (2010-2015)
- percentage -



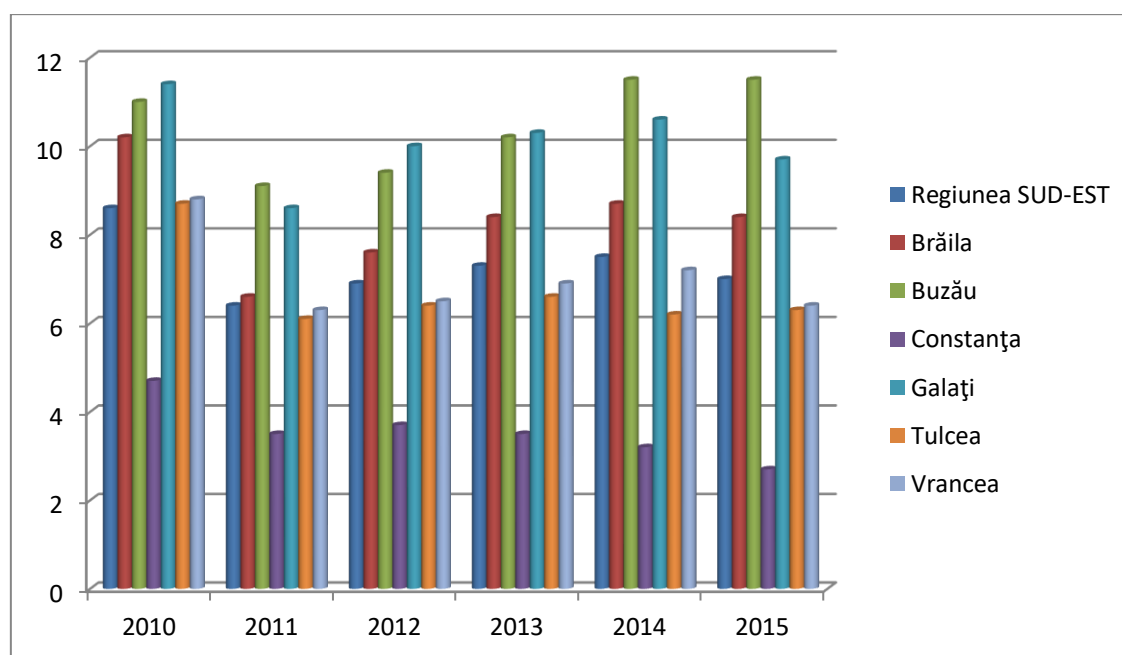
Source: data processed from the National Institute of Statistics, 2017

Figure no. 30 Unemployment rate at regional level, female population (2010-2015)
- percentage -



Source: data processed from the National Institute of Statistics, 2017

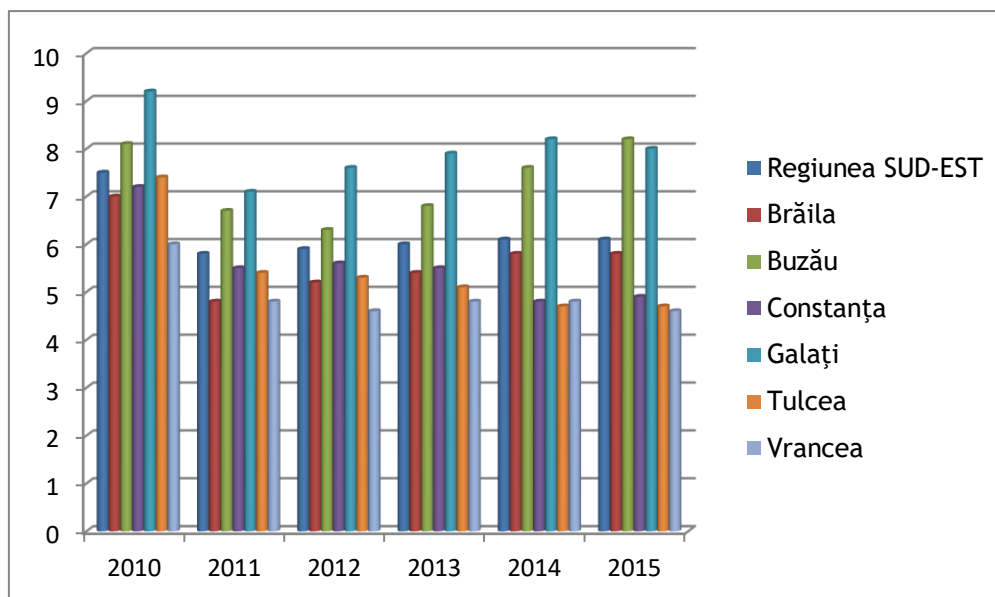
Figure no. 31 Unemployment rate in South-East Region, by counties - male population (2010-2015)
- percentage -



Source: data processed from the National Institute of Statistics, 2017

Figure no. 32 Unemployment rate in South-East Region, by counties - female population (2010-2015)

- percentage -



Source: data processed from the National Institute of Statistics, 2017

Active civilian population, by activities of the national economy

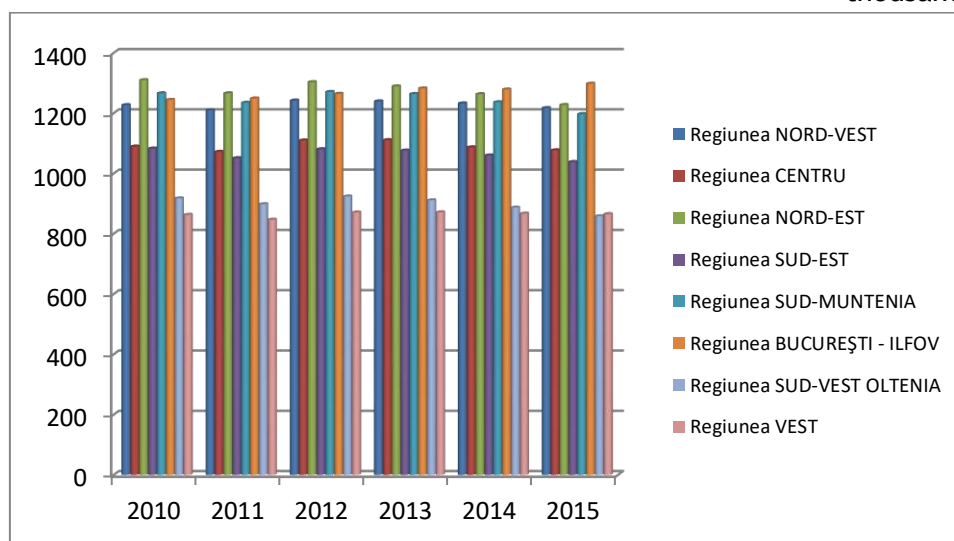
The active population registered in Romania in 2015 was 8,776.8 thousand people, the lowest value registered during 2010-2015. At regional level, the same negative evolution of the active population was maintained, except the case of Bucharest-Ilfov Development Region, where the active population increased by 4.3 percent in 2015 compared to 2010.

The South-East Region occupies the seventh position in the national ranking of the active population, with a value of 1,037.9 thousand persons in 2015, being superior hierarchically only to the South-West Oltenia Region, which registered the value of 858 thousand persons.

At county level, the highest number of active persons was recorded by Constanța County (300.1 thousand persons), value approximately 3.5 times higher than the one from Tulcea County in 2015 (85.6 thousand persons). In time, all six counties of the South-East Region registered a downward trend in the active population. This situation is justified by the fact that Constanta County is the most economically developed county in the entire region, being attractive for both foreign investors and Romanians, for whom there were sufficient funding opportunities during the analyzed period. Regarding the situation of Tulcea County, which has the lowest rate of active population, this is also explicable due

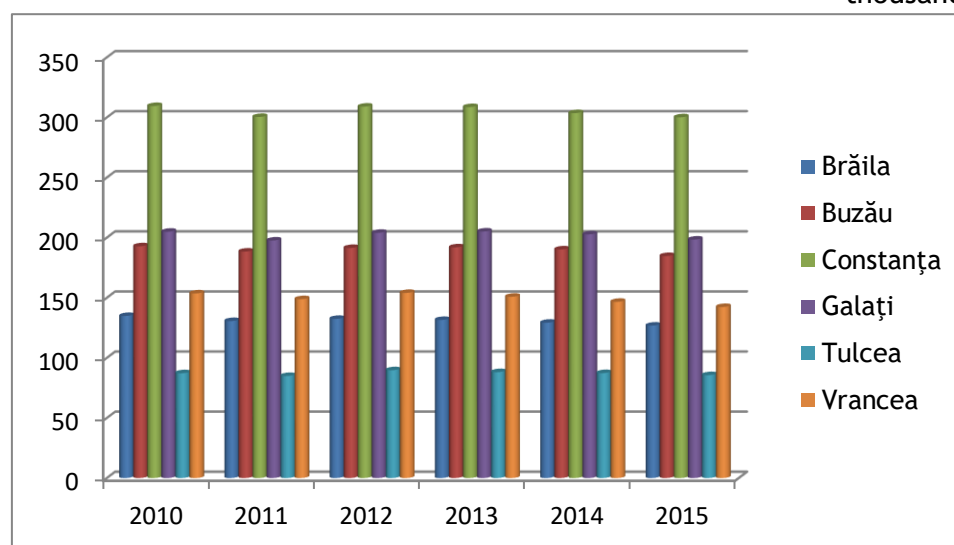
to the fact that it has a low population, as well as a large area of protected areas, which limit the possibility of business development due to strict imposed conditions.

Figure no. 33 Active population at regional level (2010-2015)
- thousand persons -



Source: data processed from the National Institute of Statistics, 2017

Figure no. 34 Active population per counties in South-East Region (2010-2015)
- thousand persons -



Source: data processed from the National Institute of Statistics, 2017

In 2015, most of Romania's population was employed in agriculture (2,003.1 thousand persons), industry (1,872.3 thousand persons) and commerce (1,223.6 thousand persons), and the activities of the national economy with the lowest active population were real estate transactions and cultural and recreational activities.

In the South-East Region, in the same year, the population was mainly occupied in agriculture (274.3 thousand persons), followed by industry (194.5 thousand persons),

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commerce (136.6 thousand persons) and construction (83, 6 thousand persons), similarly situation of the national economy. An activity of the national economy, which registered the highest value in 2015 at the level of the South-East Region compared to the other development regions in Romania, is the water distribution, sanitation, waste management and decontamination activities due to the projects implemented within the Sectoral Operational Program Environment 2007-2013, the South-East Region thus being noted for the attention paid to environmental protection.

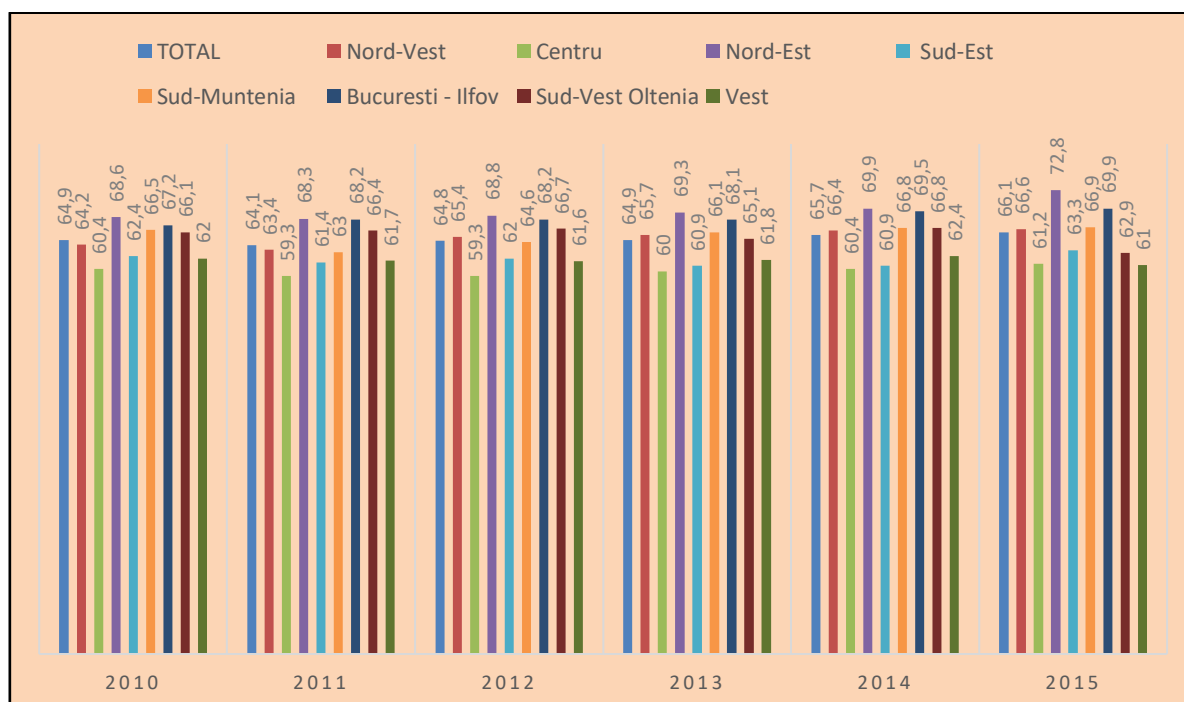
In the South-East Region, Constanta County recorded the highest values for the active population in all activities of the national economy, except for agriculture, forestry and fishing activities, in which case the highest value in 2015 is registered in Buzău County (61.2 thousand occupied persons).

Activity rate by regions and counties

Activity rate is the ratio between the active population and the total population aged 15-64, expressed as a percentage.

The evolution of the activity rate of the population aged 15 years and over, by gender, during 2010-2015, is presented in the chart below.

Figure no. 35 Activity rate at national and regional level (2010-2015)
- percentage -



Source: data processed from the National Institute of Statistics, 2017

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It can be noticed that in all the analyzed years and for all regions the situation is relatively homogeneous, without statistically significant discrepancies.

The activity rate for the total population aged 15 years and over was 54.5% in 2015. The value of the indicators differs by gender, 64.5% for male and 45.2% for females. Slight differences are obtained by calculating the value for this indicator by residence areas: 54.7% in urban areas and 54.3% in rural areas.

At regional level, the North-East Region has the highest overall activity rate (62.2%). The male population recorded the highest activity rate in the same region with 69.7% and the female population recorded the highest activity rate in the same region with 59.4%. By residence areas, the activity rate on the overall and in the rural area has the highest value in the same region (North-East), but for the urban areas Bucharest-Ilfov Region is ranked highest, with the highest level of 58.7%.

The activity rate of the working age population (15-64 years) is generally calculated by gender, by residence area and by age group.

The activity rate of the working age population (15-64 years) registered a value of 66.1% in 2015. The value of the indicator is different by gender, 75.3% for male population and 56.7% for female population. The highest values were recorded in the North-East Region, similarly to the analysis of the evolution of the activity rate of the population aged 15 and over. Also in the South-East Region, the male population activity rate is higher than that of the female population throughout the entire analyzed timeframe.

The lowest total activity rate is recorded in the West Region (61%). Considering the gender dimension, the indicator registers the lowest value for the male population in the Centre Region with 71.1% and for the female population in the same region with 51.2%.

The activity rate of the population (15-64 years) was 66.1% in 2015. Slight differences are obtained by calculating the indicator by residential areas: 66.4% in rural areas and 65.9% in urban areas for the same year.

In the urban area, the highest value is recorded by the Bucharest-Ilfov Region with 70.8% and in the rural areas by the North-East Region (77.6%).

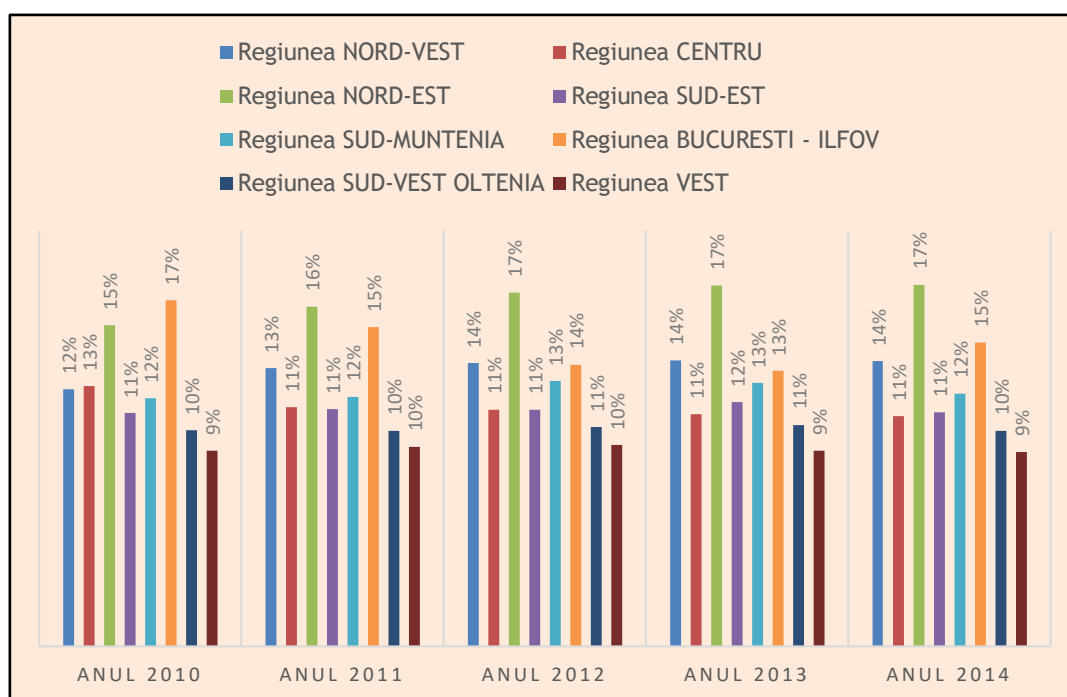
As a result of the analysis, it can be noticed that the highest rates of activity are registered in the North-East Region. The highest rate in urban areas is observed in the Bucharest-Ilfov Region. In the South-East Region, the activity rate is higher in rural than in the urban areas for the population aged 15-64.

Training level of the population

A graduate is the student / student who has finalized the last year of study in a school / faculty, if he has passed the graduation, baccalaureate, bachelor's degree exam, etc. The number of graduates refers to the end of the school / university year (after the second examination). A graduate with a diploma is the person who passed the graduation exam at the end of a school cycle and obtained a diploma (e.g. a baccalaureate diploma, a bachelor's degree, a master's degree, a doctoral degree, a graduation diploma, etc.)².

The chart below shows the situation at regional level, analyzing the evolution of the share of each region in total graduates at national level.

Figure no. 36 The situation of graduates at regional level (2010-2014)
- percentage -



Source: data processed from the National Institute of Statistics, 2017

It can be noticed that the percentages are relatively constant throughout the analyzed period. The North-East Region is highlighted as having the highest number of graduates, but this is explained by the fact that it has it's the most populated among the regions. The second place is attributed to Bucharest-Ilfov Region, but here the explanation lies in the

² The data provided for higher education is based on the faculty location.

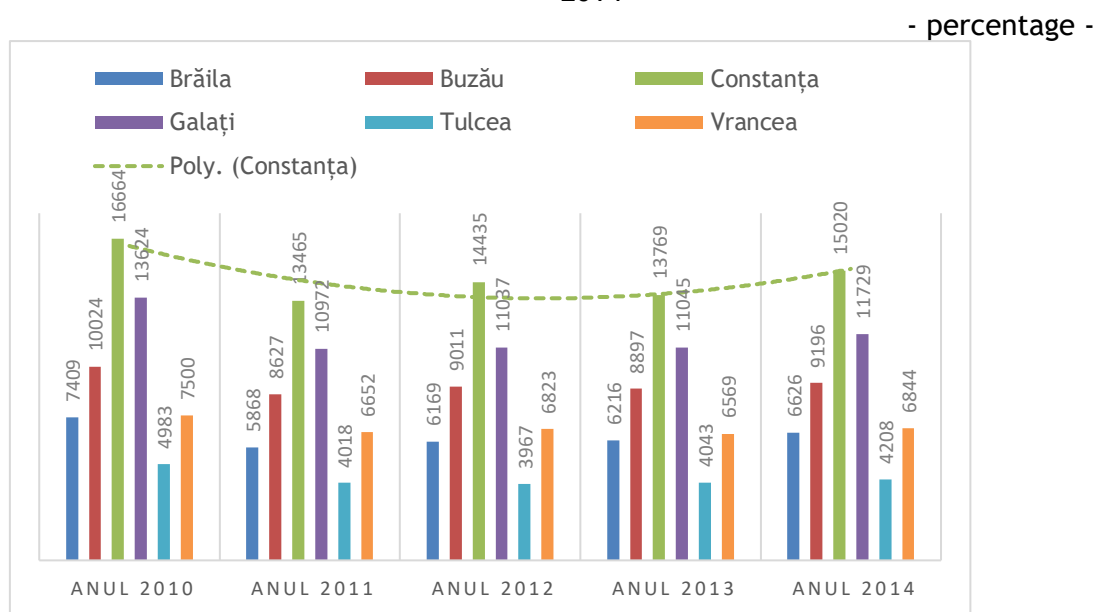
Since 2011 (academic year 2011/2012), there is no longer available data for short-term academic education because this program is no longer organized in the educational system in Romania.

Starting with the academic year 2014/2015, the data on the number of graduates in higher education refers to the number of graduates with a diploma (for example, graduates with a Bachelor's, Master's or PhD degree).

fact that, considering the university level, the number of graduates is registered according to the location of the faculty.

There is no data available for analyzing the migration of the population, from birth to study place, especially for higher education levels.

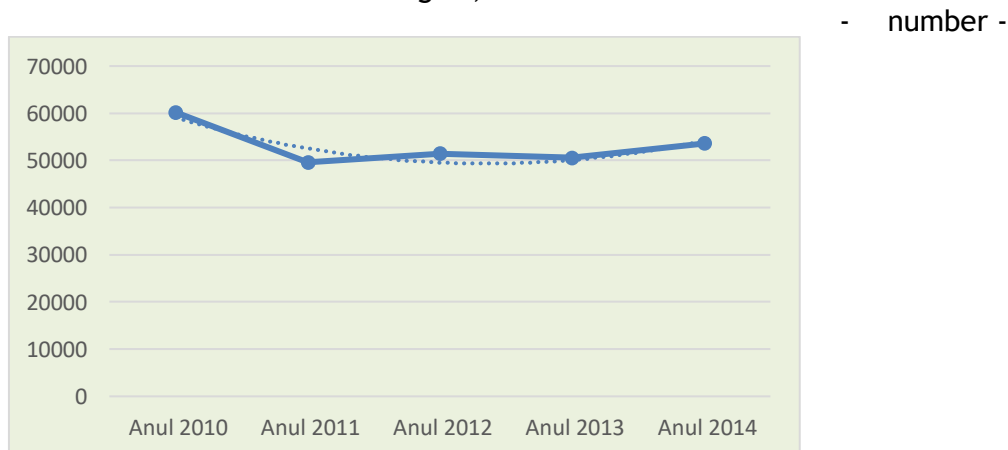
Figure no. 37 Evolution of the number of pre-university graduates at county level, 2010-2014



Source: data processed from the National Institute of Statistics, 2017

At county level, the highest number of pre-university graduates is recorded in Constanța, followed by Galați, the last being Tulcea, due to the lower number of residents.

Figure no. 38 Evolution of the number of pre-university graduates in the South-East Region, 2010-2014



Source: data processed from the National Institute of Statistics, 2017

A situation for the higher education is presented in the table below.

Table no. 2 Graduates by different levels of education, per counties (2010 and 2014)

- number -

Level of education	Region/ County	Year	Number
Long-term university education	South-East Region	2010	15.465
	Brăila	2010	417
	Buzău	2010	123
	Constanța	2010	10.278
	Galați	2010	4.496
	Vrancea	2010	151
University education - graduates with a master's degree and postgraduate education	South-East Region	2014	2.766
	Brăila	2014	77
	Buzău	2014	30
	Constanța	2014	1.285
	Galați	2014	1.349
	Vrancea	2014	25
University education - graduates with a degree - PhD and postdoctoral programs	South-East Region	2014	120
	Constanța	2014	55
	Galați	2014	65

Source: National Institute of Statistics, 2017

Data is available only for 2010 and 2014, as well as for Constanta and Galati, the two university centers of the region. No further complex analysis of the evolution or structure can be made due to the precariousness of the available data.

The situation of graduates in higher education, by groups of specializations, forms of ownership, development region and counties, is presented in the Annexes. The tables show either an increase in the number of graduates in 2012 and 2013 or the data only for 2012 and 2013, which means that those are newly established specializations. It is noticed that legal, economic and medical specializations are the most sought after, although the highest global number of graduates is in teaching, but the figure is sum of individual specializations.

c) Entrepreneurship in the South-East Region / Situation of enterprises in the South-East Region

This section aims to present the particularly important economic phenomena at the level of enterprises in the South-East Region and to highlight the multiple results that are reflected only in the economic and financial welfare of the region.

The most representative effect of the phenomenon of globalization and the global economic crisis led to a series of changes from the entrepreneurial point of view, manifested on the one hand by the existence of the pressure of national competitiveness and the need for financing at the enterprise level as well as through a slight economic recovery observed especially during the second part of the analyzed time horizon (2010-2015).

Number of active local units, including economic sectors and size

The enterprise is a group of legal entities that are constituted as an organizational entity for the production of goods, commercial services or services of social interest, which has decisional autonomy, in particular for the assurance of its current resources.

An active local unit is an enterprise or part of it (workshop, factory, warehouse, office or station etc.) located at an identifiable address and which is economically active (during the observation period) or which records expenses and draws up and balance sheet³.

Interpretation

For the purpose of illustrating the structure of local active units in Romania, their number has been selected in absolute value for the year 2015, both by development regions and by counties. Thus, two interlinked images, the one at the macro level, are outlining, surprising the spread of active units by regions, and the one at the county level, which offers increased granularity and a perspective on local leaders.

The chart below reveals an approximately uniformly distributed regional structure with each region accounting for an average of 12.5 percent of all active units. The central element of the structure, namely the Bucharest-Ilfov Region, which has a quarter of the entire mass of observations, is easily observed. At the opposite end of the spectrum is the South-West Oltenia Region with a modest share of 9%, noticeably lower than the rest of the cases but not substantially different from the average value.

By increasing the degree of detail of the data set by analyzing the same variable, in this case the number of active local units at county level, one can understand the reasons behind the previously deduced hierarchy. Thus, the main identified anomaly is

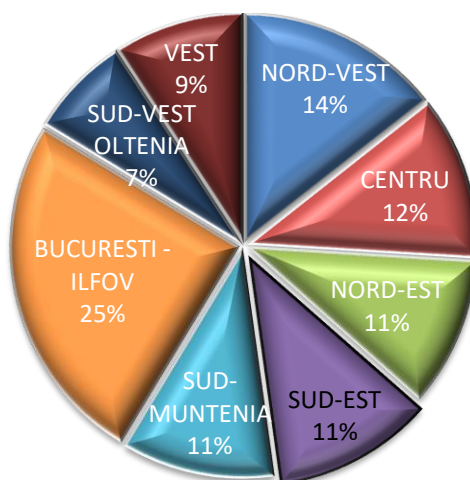
³ National Institute of Statistics

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represented by Bucharest. The capital exceeds the following ranked unit in size by more than 3 times (Cluj-Napoca), being the residence for about 110,000 active units. In the same way, the second rank can be explained among regions as 3 of the top 10 counties are located in the North-West Region.

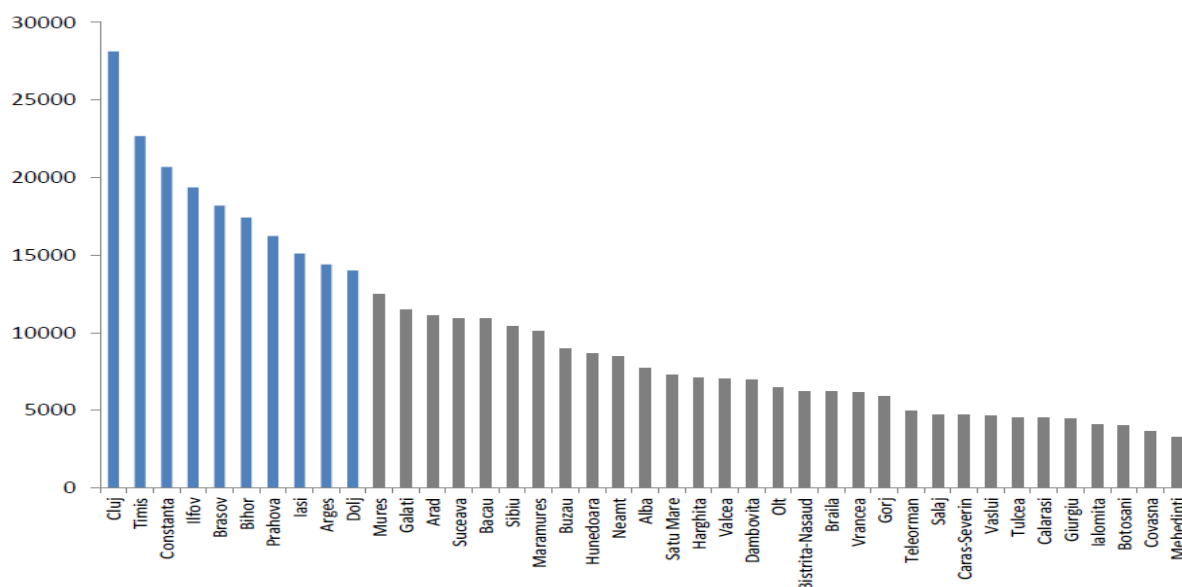
As expected, the general level of development of a city is a determinant of entrepreneurial initiatives in its territory. An almost worrying fact is the concentration of 21.3% of the active units in Bucharest, but recent regional initiatives bring with them the prospect of diversifying business opportunities in the rest of the country.

Figure no. 39 The structure of local active local units at regional level (2015)
- percentage -



Source: data processed from the National Institute of Statistics, 2017

Figure no. 40 Distribution of the number of local active units per county (2015 - excluding Bucharest)
- number -

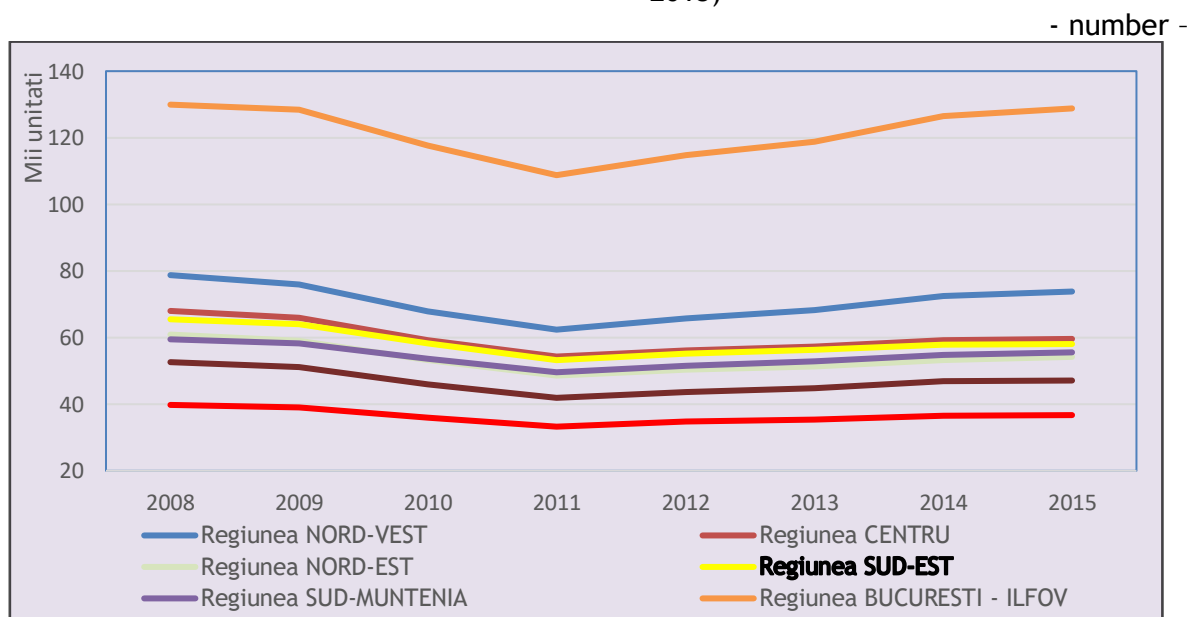


Source: data processed from the National Institute of Statistics, 2017

Regarding the dynamics of the number of local active units, it is immediately visible from the chart below the lowest point reached in 2011. Prior to this, the decline due to the economic crisis and the recession related to it occurred with an average intensity of 2.5%, 9.2% and 8.1%, for the periods 2008-2009, 2009-2010 and 2010-2011. Although an increase in the average number of active local units is observed after 2011, it reached in 2015 only 91.7% of the value registered in 2008. This undoubtedly reveals the impact felt by small economy following a macro-economic disaster at international level, an event from which the regional business environment still hasn't recovered to its pre-crisis level, even after 7 years.

By increasing the detail of the observations and by visualizing three representatives for the average value and for the upper and lower end of the spectrum of the number of active units, the most prominent image is the obvious recovery of the developed counties, while those with a medium or low level of development are on a descending slope. This pattern of economic polarization acts as a self-consolidating loop and leads to the concentration of opportunities in some key areas, which, among other things, was successfully presented by Reinert (2007). At the same time, the absolute minimum value for highly developed counties is less volatile considering net values, with the average decrease of the number of enterprises being 18.5%, while the poorly developed counties experienced an average decrease of 22.4%.

Figure no. 41 Dynamics of the number of local units active at regional level (2008-2015)

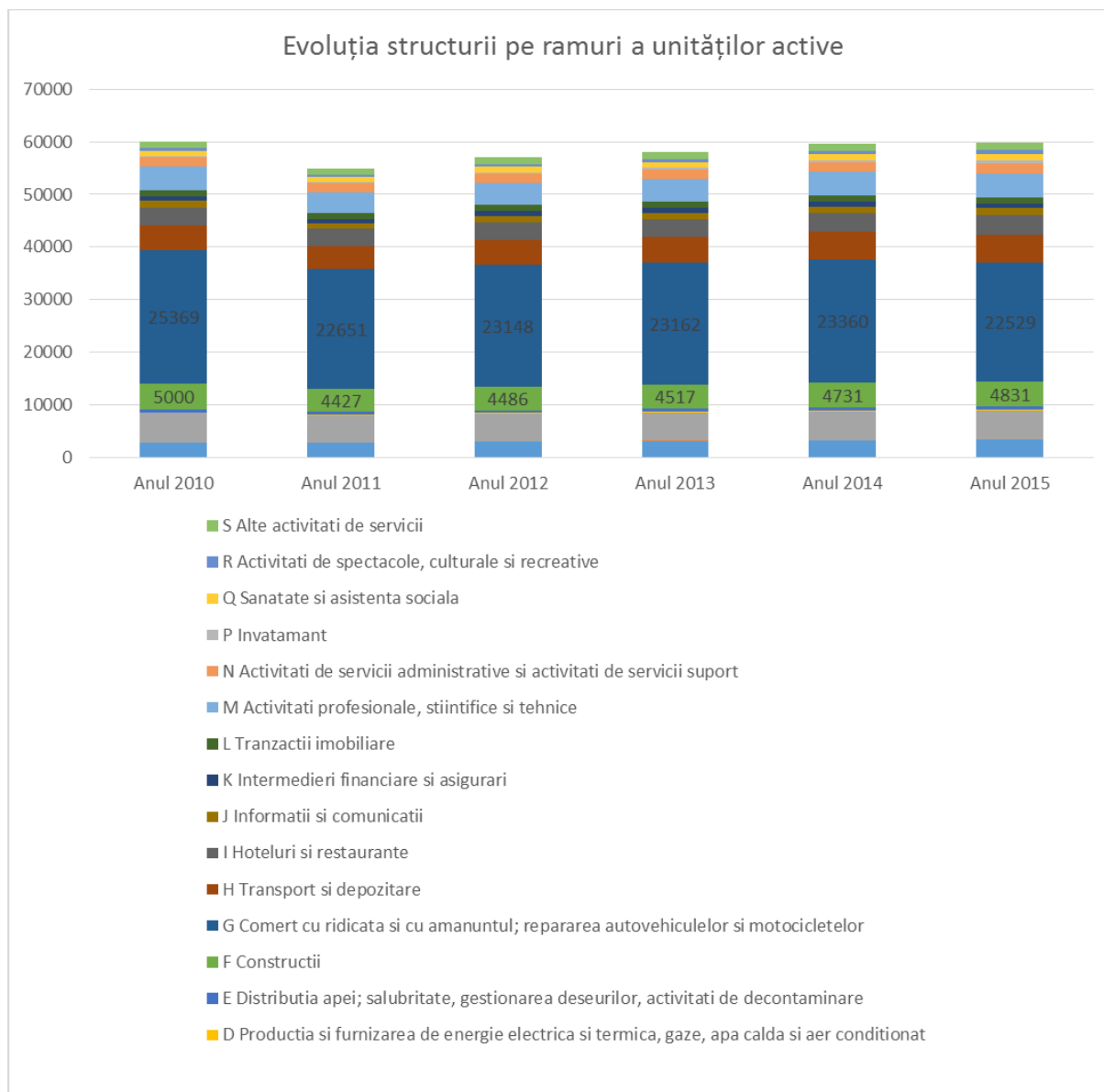


Source: data processed from the National Institute of Statistics, 2017

The evolution of the composition of the number of active units is illustrated in the chart below.

Figure no. 42 Evolution of the active units at national level, by economic sector (2010-2015)

- number -



Source: data processed from the National Institute of Statistics, 2017

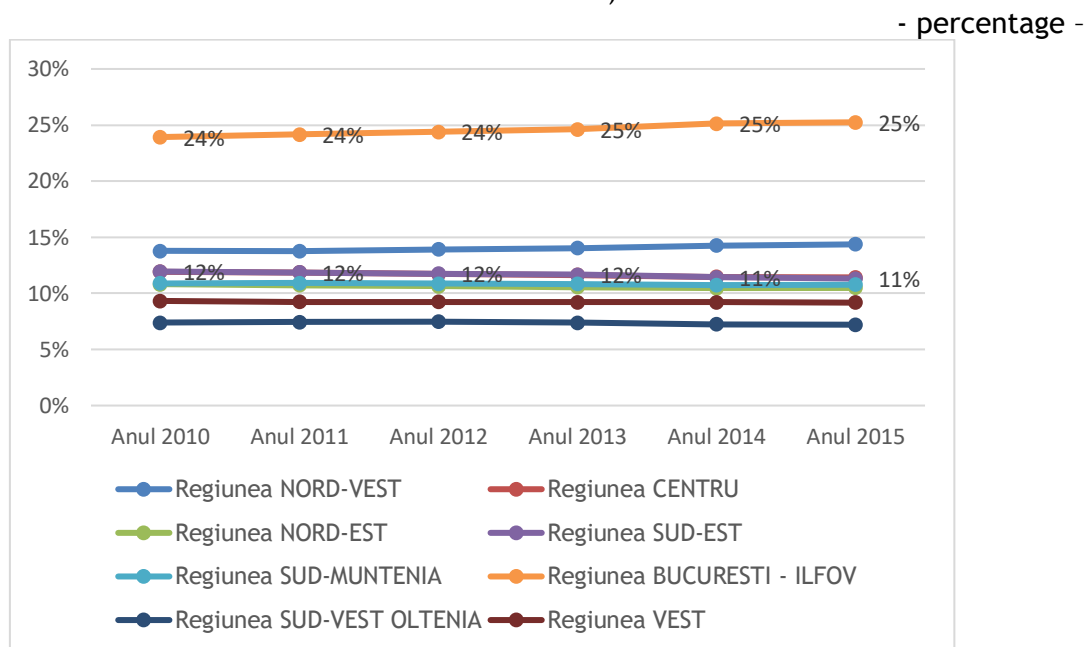
By analyzing the chart, it can be noted that most of the active units are in the wholesale and retail commerce; repair of motor vehicles and motorcycles, followed by construction. The evolution of the structure is relatively stable over the analyzed timeframe.

The distribution of active local units, by activities of the national economy according NACE Rev.2 division, in the South-East Region is presented in Annexes. It can be noticed that the

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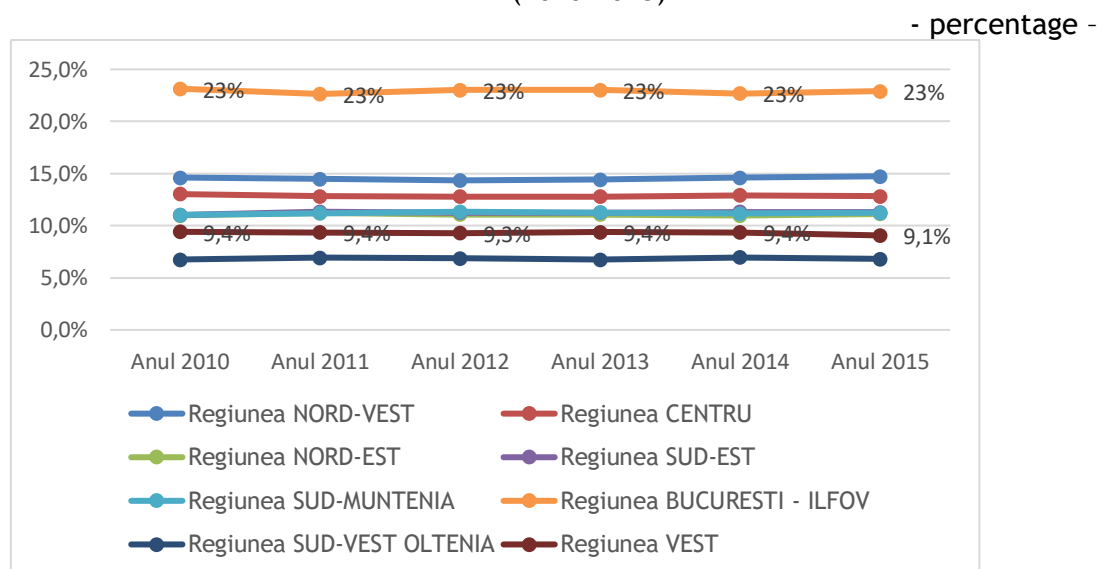
highest number of active local units are in retail commerce, except for motor vehicles and motorcycles, and the fewest in combined services of health care and social assistance, with accommodation.

Figure no. 43 Evolution of the share of enterprises of 0-9 employees of each region (2010-2015)



Source: data processed from the National Institute of Statistics, 2017

Figure no. 44 Evolution of the share of enterprises of 10-49 employees of each region (2010-2015)-



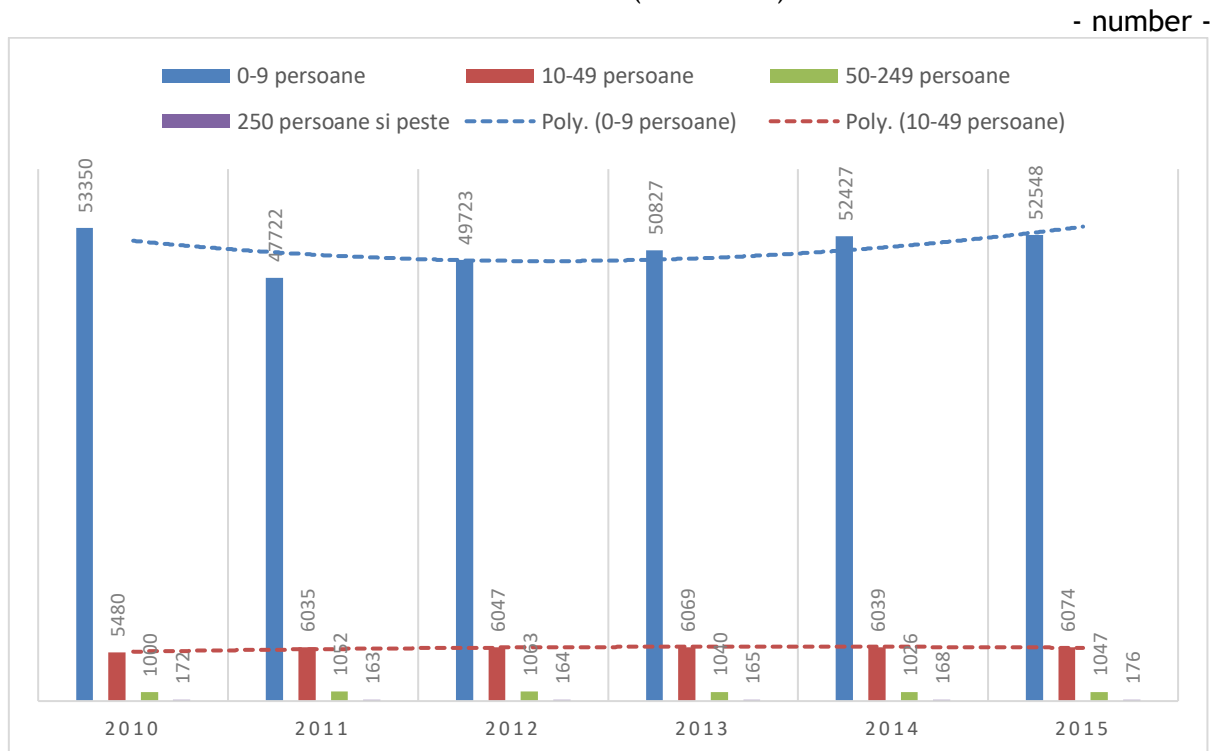
Source: data processed from the National Institute of Statistics, 2017

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The structure is stable both in terms of temporal evolution and regions. The Bucharest-Ilfov region surpasses the other regions, and so the presentation of the last two size classes becomes redundant.

By size classes, the status of the number of active units is as follows

Figure no. 45 Evolution of the number of active units by size class at regional level (2010-2015)



Source: data processed from the National Institute of Statistics, 2017

By analyzing the chart presented above, it can easily be noticed that most of the active units are enterprises with 0-9 persons, but their number has evolved from 53,350 in 2010 to 52,458 in 2015. The fewest enterprises are the large ones, with more than 250 employees, whose number increased from 172 enterprises in 2010 to 176 enterprises in 2015, but their number increased by only 4 units during 2010-2015, as the requirements of entry into this class size are considerably higher than for the others.

Density of active local units

For the estimation of the density of the active units it was taken into account the surface of the component counties of the South-East Region, which is presented in the table below:

Table no. 3 Surface area of the counties of the South-East Region

-kmp-

Counties	Surface area
Brăila	4.766
Buzău	6.103
Constanța	7.071
Galați	4.466
Tulcea	8.499
Vrancea	4.857

Source: National Institute of Statistics, 2017

The density of the active units determined as the ratio between the number of active units and the county surface is shown in the table below:

Table no. 4 Density of active units at county level, 2010-2015

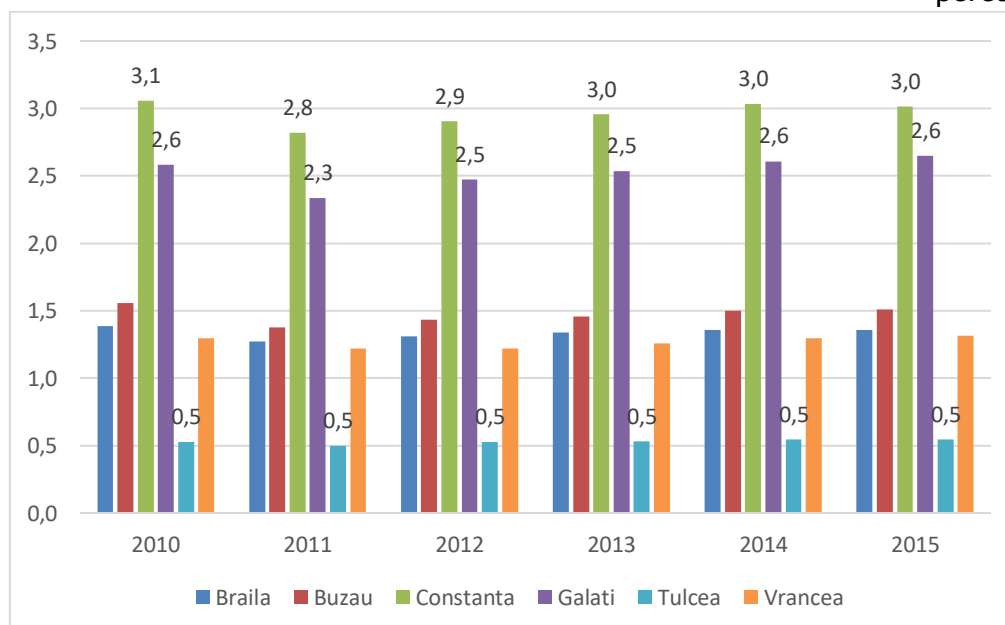
- percentage-

County	2010	2011	2012	2013	2014	2015
Brăila	1,4	1,3	1,3	1,3	1,4	1,4
Buzău	1,6	1,4	1,4	1,5	1,5	1,5
Constanța	3,1	2,8	2,9	3,0	3,0	3,0
Galați	2,6	2,3	2,5	2,5	2,6	2,6
Tulcea	0,5	0,5	0,5	0,5	0,5	0,5
Vrancea	1,3	1,2	1,2	1,3	1,3	1,3

Source: National Institute of Statistics, 2017

Figure no. 46 Evolution of the density of active units per square kilometer at county level, 2010-2015

- percentage-



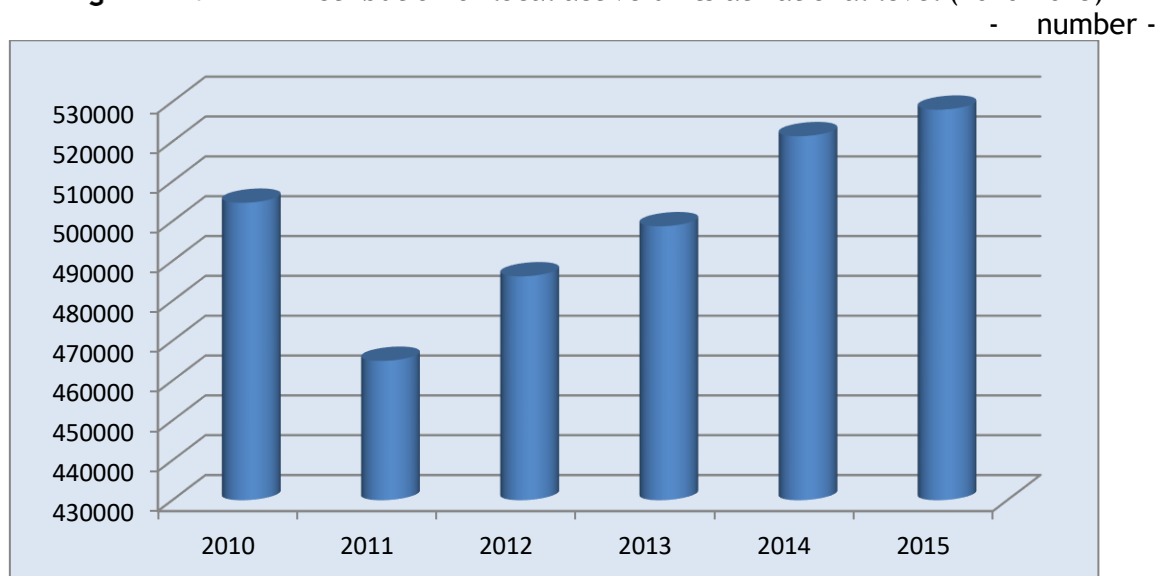
Source: National Institute of Statistics, 2017

From the above presented chart, it can be noticed that the most developed counties are Constanta and Galati, and the last one is Tulcea County. In Constanta, the density was 3.1 active units per square km in 2010 and it recorded a slight decrease to 3 active units per square km.

Distribution of active local units by activity sector

The distribution of local active units in the period 2010-2015 at national level can be defined by the existence of a fluctuation between 2010 and 2011, marked by a decrease of active local units of 39,683 units in 2011 compared to the previous year. However, starting from 2011, a continuous positive evolution of the number of active local units can be observed, reaching in 2015 the value of 528,040 units.

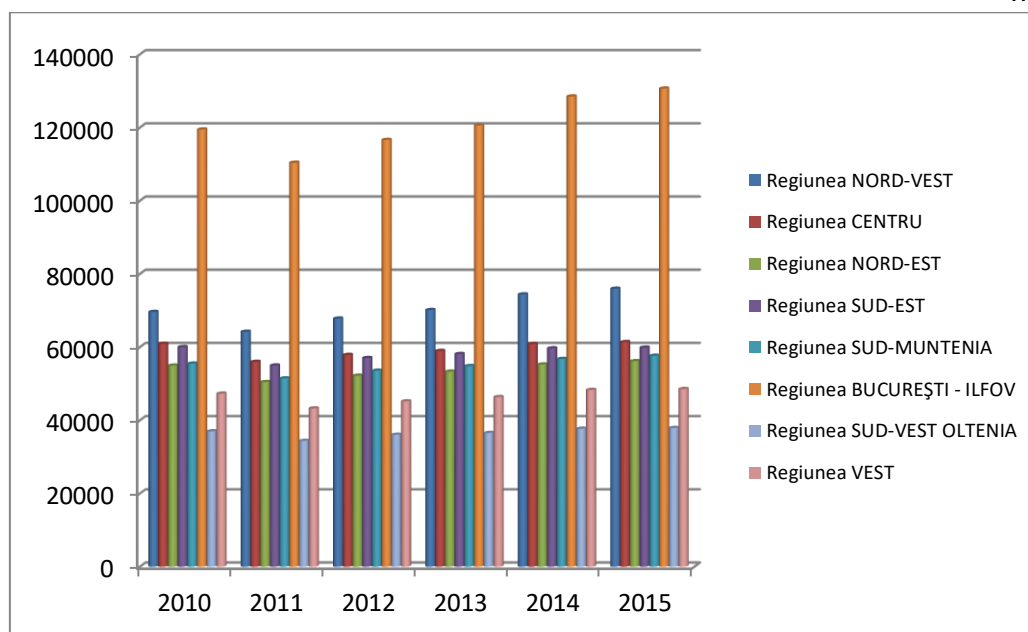
Figure no. 47 Distribution of local active units at national level (2010-2015)



Source: data processed from the National Institute of Statistics, 2017

At regional level, the distribution of active local units is not homogeneous, with significant disparities between the Bucharest-Ilfov Region and the other development regions. The Bucharest-Ilfov region has a number of 130,635 active local units in 2015 after a steady progress since 2010. The next region in the ranking of the regions with the highest number of active local units at the end of 2015 is the North-West Region, having 75,947, which is significantly different from the Bucharest-Ilfov Region. The lowest number of active local units in 2015 is registered in the South-West Oltenia Region, with a total of 37,903, followed by West Region, with 48,541 active local units. The South-East Region ranks fourth, with a total of 59,845 active local units.

Figure no. 48 Distribution of active local units by development regions (2010-2015)
- number -



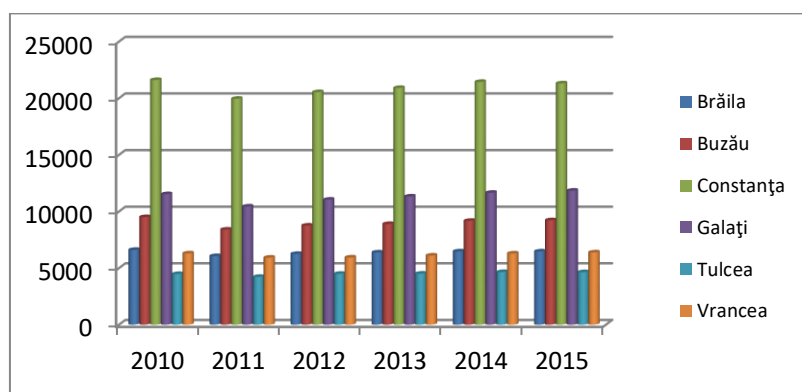
Source: data processed from the National Institute of Statistics, 2017

In 2015, the number of active local units in the South-East Region reached the highest value in the county of Constanta (21,311), followed by Galați County, with a number of 11,834 active local units. Tulcea and Vrancea counties had the lowest number of active local units, respectively 4,636 and 6,379, at a relatively small distance from Braila county, which had a total number of 6,464. There is also a decrease in the number of active units between 2010-2011 at the level of each county, with the situation showing an upward trend during 2011-2015.

Constanta County occupies the first position in terms of number of local units active in 2015 for each activity sector, bringing a contribution of 35.61% of the total number of local active units in the South-East Region. This can be explained by the fact that Constanta County is a pole of growth in the region, attracting a considerable number of direct foreign investments, and accessing European and governmental funds that have led to the development of the area. Tulcea registered low values for this indicator due to the fact that the county has a low population and a large area of protected areas that limited the possibility of business development in those areas.

Figure no. 49 Distribution of active local units at the level of the South-East Region divided by counties (2010-2015)

- number -



Source: data processed from the National Institute of Statistics, 2017

The analysis shows that the sectors of activity with the highest number of active local units in 2015 in the South-East Region are: Wholesale and retail; repair of motor vehicles and motorcycles (22,529), Manufacturing (5,509) and Transport and storage (5,405). In addition to the contribution of Constanta County to the total number of active local units in the wholesale and retail commerce, repair of motor vehicles and motorcycles at the end of 2015 (6.757), a significant number of local active local are found in Galați County, respectively 5.205. As far as the manufacturing sector is concerned, Constanța has 1,702 active local units, followed by Buzău with 1,062 and Galati with 960 in 2015.

The mining industry has the lowest number of active local units in the South-East Region (138), followed by the production and supply of electricity and heat, gas, hot water and air conditioning (158) and education (402).

Dynamics of SMEs activity in 2010-2015 at national and regional level

The main criteria taken into account for classifying a business in one of the three categories (micro, small or medium) are: number of employees and turnover.

The European Commission definition of SMEs defines three categories of small and medium-sized enterprises:

- Micro-enterprises: enterprises with less than 10 employees and an annual turnover or social capital that must not exceed EUR 2 million;
- Small enterprises: enterprises with a number of employees between 10 and 49, as well as an annual turnover or social capital that must not exceed 10 million Euros;

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- Medium enterprises: enterprises with a number of employees between 50 and 249, and with an annual turnover of no more than 50 million Euros (or a social capital that must not exceed 43 million Euros).

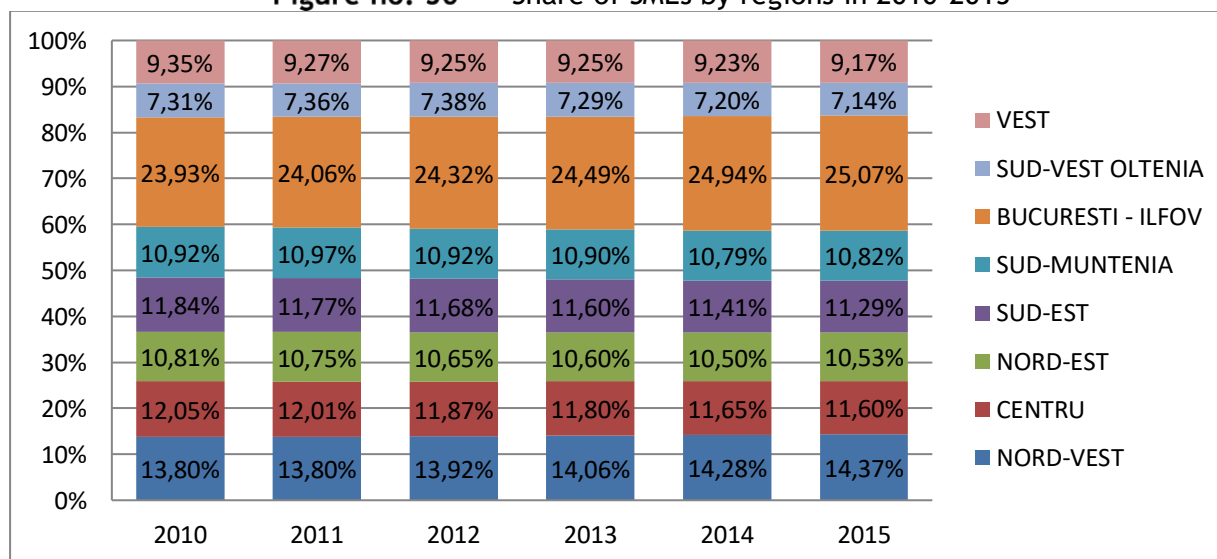
Table no. 5 Enterprises per size

Type of enterprise	Number of employees	Turnover
Microenterprise	[0,10)	≤ 2 million €
Small enterprise	[10,50)	≤ 10 million €
Medium enterprise	[50,250)	≤ 50 million €

In Romania, between 2010 and 2015, micro-enterprises were dominant in numbers, representing 89.14% of all enterprises in 2010, while in 2015 their share was 88.65%. Small enterprises accounted for 8.91% of all enterprises in 2010, and in 2015 their share was 9.34%. Medium enterprises are the least in numbers among all enterprises, meaning 1.64% in 2010 and 1.67% in 2015.

From a territorial point of view, the structural evolution is presented in the chart below:

Figure no. 50 Share of SMEs by regions in 2010-2015



Source: data processed from the National Institute of Statistics, 2017

The highest number of enterprises was in the Bucharest-Ilfov Region in 2010, having a share of 23.93% in 2010, with a slight increase reaching 25.07% in 2015.

The lowest number of enterprises was in the South-West Oltenia Region, in 2010 with a share of 7.31%, with a slight decrease reaching 7.14% in 2015.

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It is noted that in general there is an upward trend for each county and each category of SMEs.

Moreover, the highest number of enterprises is recorded in Constanta County, because it is the county that attracts the most business opportunities due to the presence of the motorway, the harbor, the airport, the Black Sea coast, the universities, the specialized workforce.

The situation of active enterprises, by size class, by section level NACE Rev. 2 and by the number of employees, at the level of the South-East Region by counties, is presented in Annexes. The lowest number of active enterprises is, in all sectors of activity, is associated with the class between 50 and 249 employees.

Number of newly created enterprises (creation of start-ups) by economic sector, rate of creation of active local units

According to the definition identified on the website of the National Institute of Statistics, "newly created enterprises include commercial companies and individual entrepreneurs (individuals, individual enterprises, family businesses, liberal professions) carrying out non-agricultural activities, created within a certain period of time. The term "new creation" refers to the inclusion of an enterprise in the business register of enterprises that is updated monthly on the basis of the tax register".

The values collected for the indicator associated to newly created enterprises were only available for the 2010-2014 period.

Regarding the number of newly created enterprises, it is noticed that the South-East Region is in the latter part of the national ranking for almost the entire analyzed period, being outstripped by the other development regions except the South-West Oltenia and West Regions. However, between 2012 and 2014, although the number of newly created enterprises is considerably reduced compared to 2010, the South-East Region surpasses regions such as South-Muntenia, West, Center, North-East and South-West Oltenia, being surpassed only by the two highly developed regions, Bucharest-Ilfov and North-West.

Compared with the national level in terms of the number of newly created enterprises in 2014 (the most recent data available), the South-East Region has only 10.49% share of the national average.

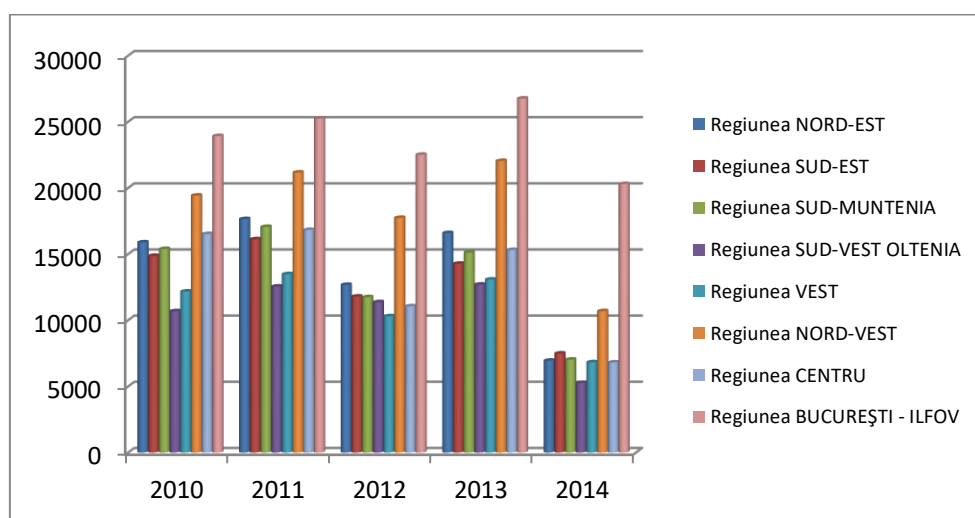
From a temporary perspective, the dynamics of this indicator in the South-East Development Region shows a drastic reduction of 49.60% from the total number of newly created enterprises in 2014 compared to 2010, which corresponds to an artificial economic

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decrease registered at national level. A single increase was recorded in the South-East Region during the analyzed period, at the level of 2011, when the rate of newly created enterprises increased from 3.8% to 4.2%. An explanation for this phenomenon is the creation and establishment of start-ups, which during the analyzed period was supported by the available sources of funding at national and European level, which encouraged these practices.

Figure no. 51 Number of newly created active enterprises, by development regions (2010-2014)

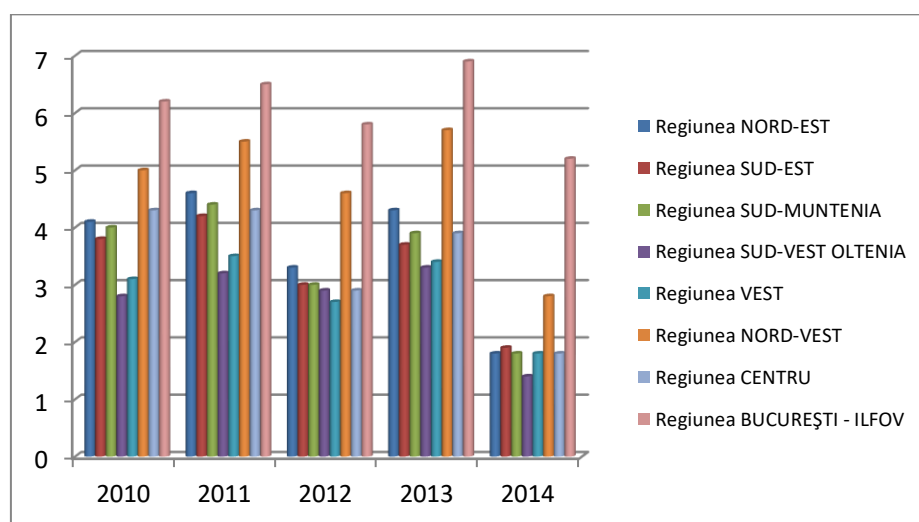
- Number -



Source: data processed from the National Institute of Statistics, 2017

Figure no. 52 The creation rate of newly created enterprises, by development regions (2010-2014)

- percentage -



Source: data processed from the National Institute of Statistics, 2017

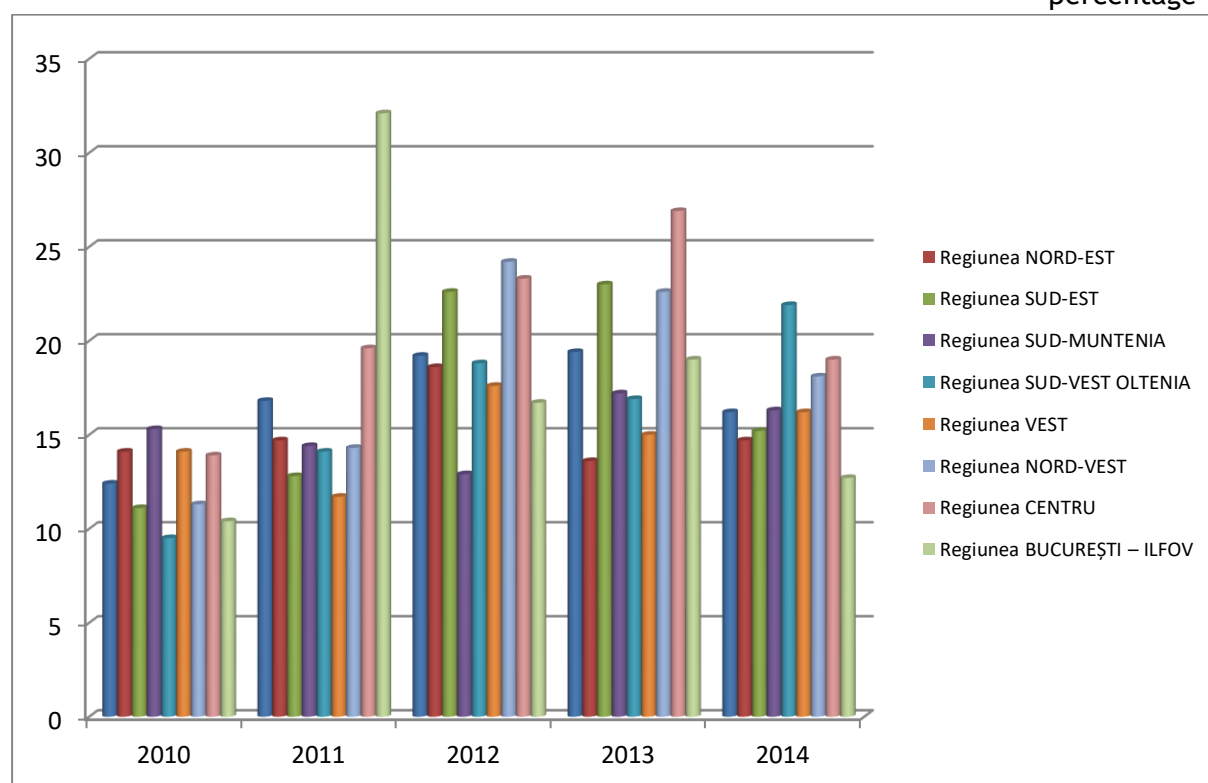
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From the point of view of the distribution of the newly created active enterprises in the South-East Region, in the last reference year (2014), the most significant share is held by the enterprises engaged in commerce (38.9% of the total), followed by active units performing other services (16.3%) and industry (15.2%).

Analyzing the dynamics of the number of newly created active enterprises in the period 2010-2014, there is a considerable reduction in the number of newly created units in the commerce sector (14.5%), this being the most relevant change in the sector of activity in this region. The other economic sector (industry, commerce, hotels and restaurants, transport and other services) showed a positive evolution in the South-East Development Region over the analyzed timeframe, transposed into increases between 1.2% and 4.6%.

Figure no. 53 Distribution of newly created enterprises, for the **industry** sector and by development regions (2010-2014)

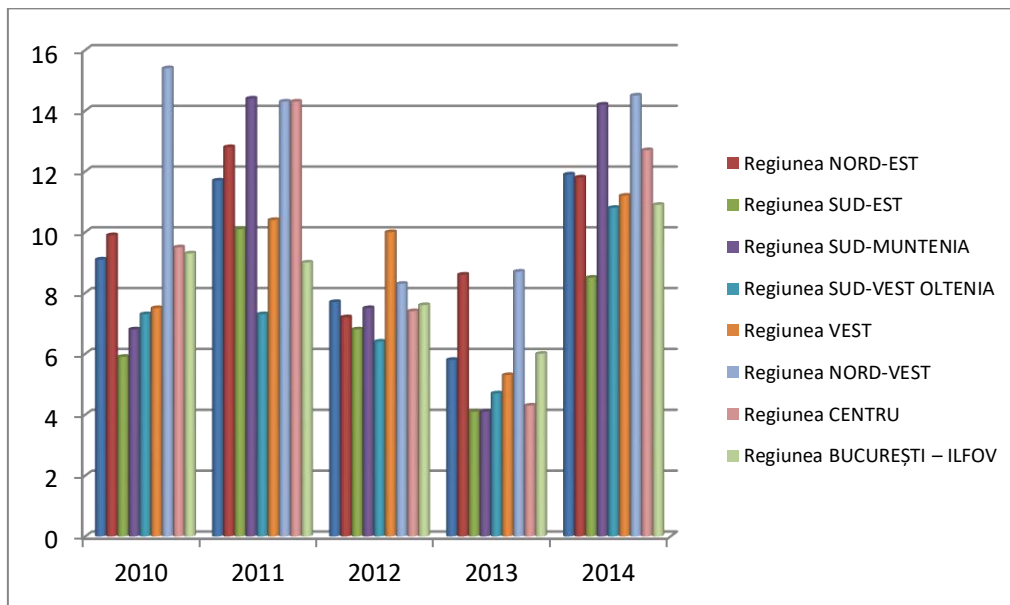
- percentage -



Source: data processed from the National Institute of Statistics, 2017

Figure no. 54 Distribution of newly created enterprises, for the construction sector and by development regions (2010-2014)

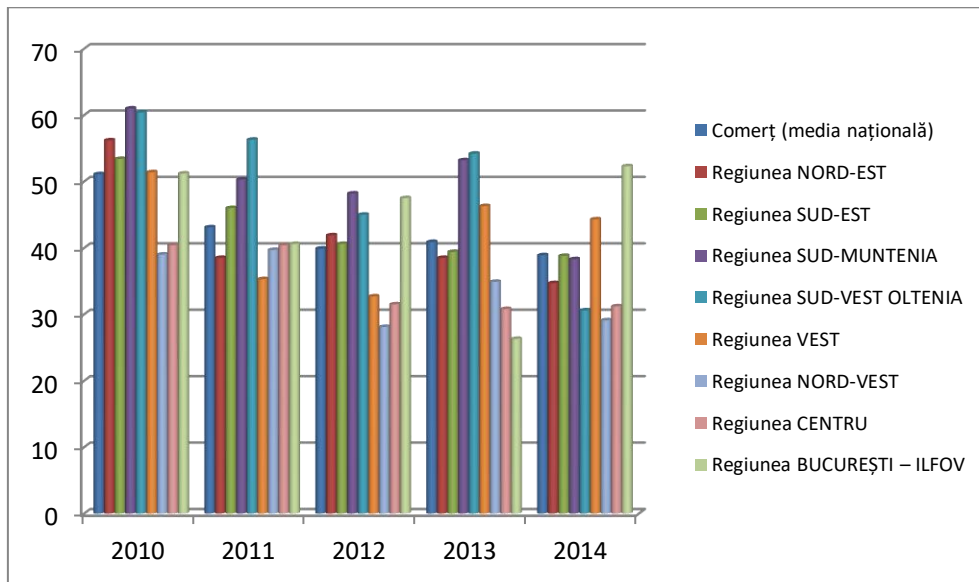
- Percentage -



Source: data processed from the National Institute of Statistics, 2017

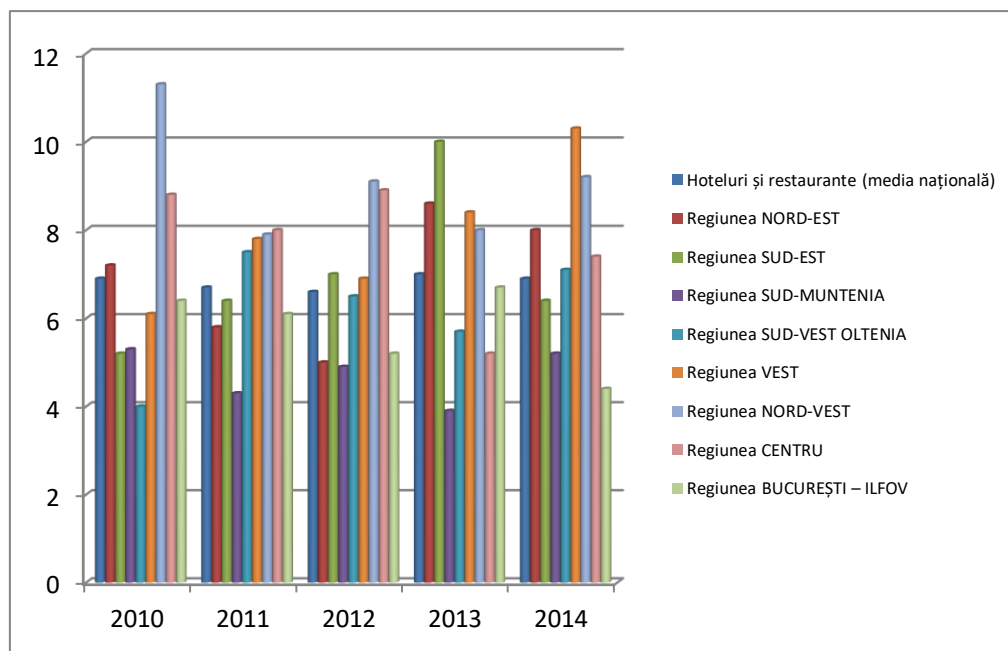
Figure no. 55 Distribution of newly created enterprises, for the commerce sector and by development regions (2010-2014)

- Percentage -



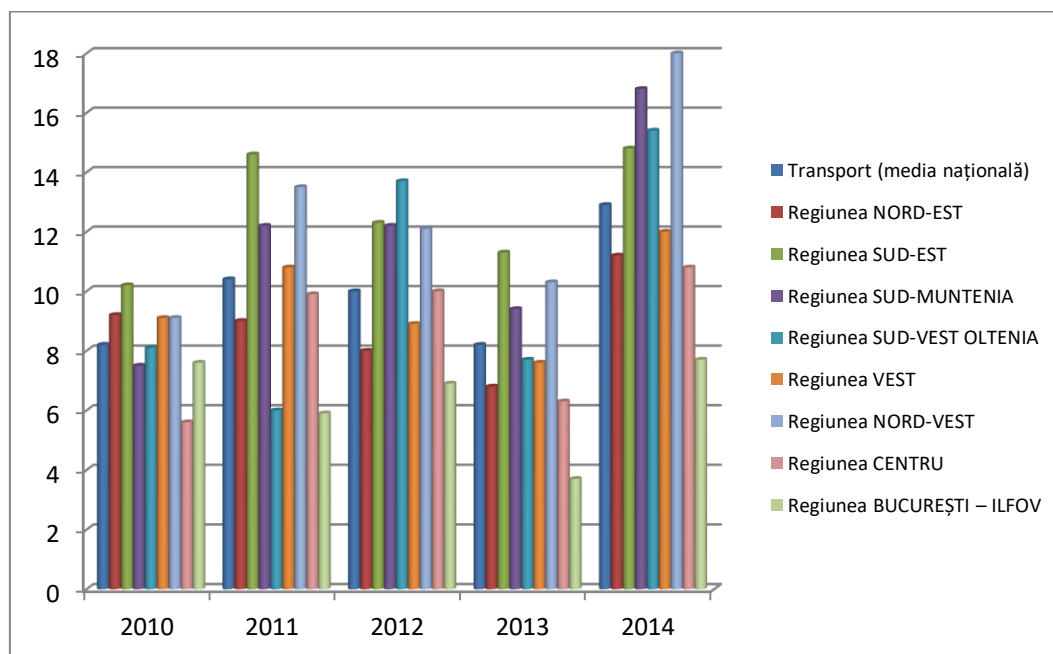
Source: data processed from the National Institute of Statistics, 2017

Figure no. 56 Distribution of newly created enterprises, for the hotels and restaurants sector and by development regions (2010-2014) - Percentage -



Source: data processed from the National Institute of Statistics, 2017

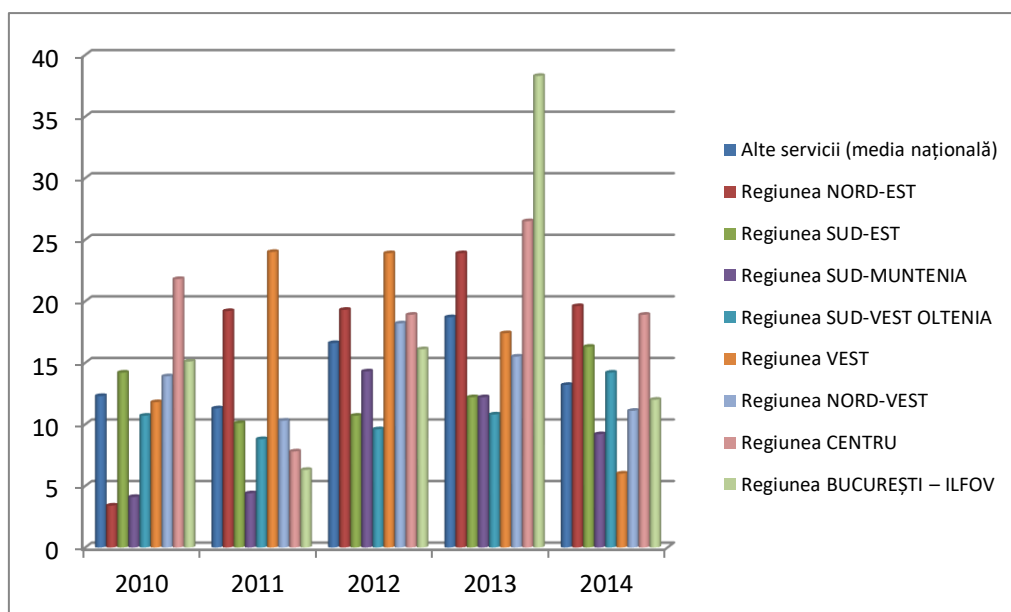
Figure no. 57 Distribution of newly created enterprises, for the transport sector and by development regions (2010-2014) - Percentage -



Source: data processed from the National Institute of Statistics, 2017

Figure no. 58 Distribution of newly created enterprises, for the other types of services sector and by development regions (2010-2014)

- Percentage -



Source: data processed from the National Institute of Statistics, 2017

Closed enterprises by sectors of the national economy at NACE section level and by legal status

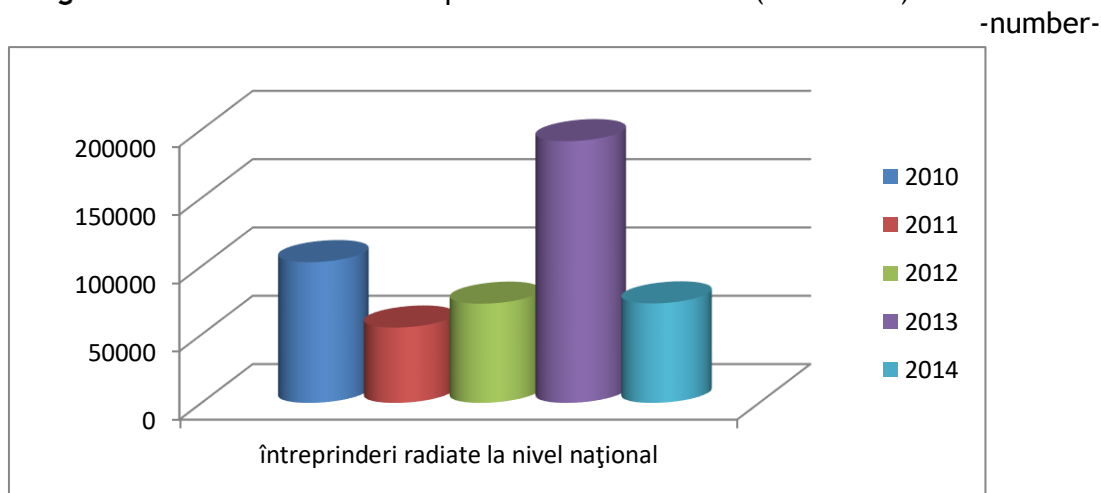
In terms of business demography, an enterprise is considered to be closed if it is not reactivated in less than 2 years.

The analysis shows a non-linear distribution of the number of closed enterprises, with significant differences within the analyzed timeframe. In 2010, the number of companies that were closed was 103,005, and in 2011 it decreased by 46% compared to the previous year, reaching 55,128. The number of closed companies increased in 2015 by 17,456 units, reaching 72,584, with a sharp increase of 62% in 2013 compared to the previous year. After the gap in 2013, in 2014 the situation showed similar values to those of 2012, namely 72,794 closed enterprises.

The data on the number of closed enterprises in the South-East Development Region shows that in 2015 this number decreased by 42.27% compared to the situation registered in 2010 and that the region represents only 16.55% of the total number of enterprises closed in 2015 at national level. At the level of the counties of the South-East Region, the same decreasing trend of the number of closed enterprises in the period 2010-2015 was maintained, the highest number being recorded in Constanta County (28.37% of the total number of closed enterprises in the South-East Region), while the lowest number was

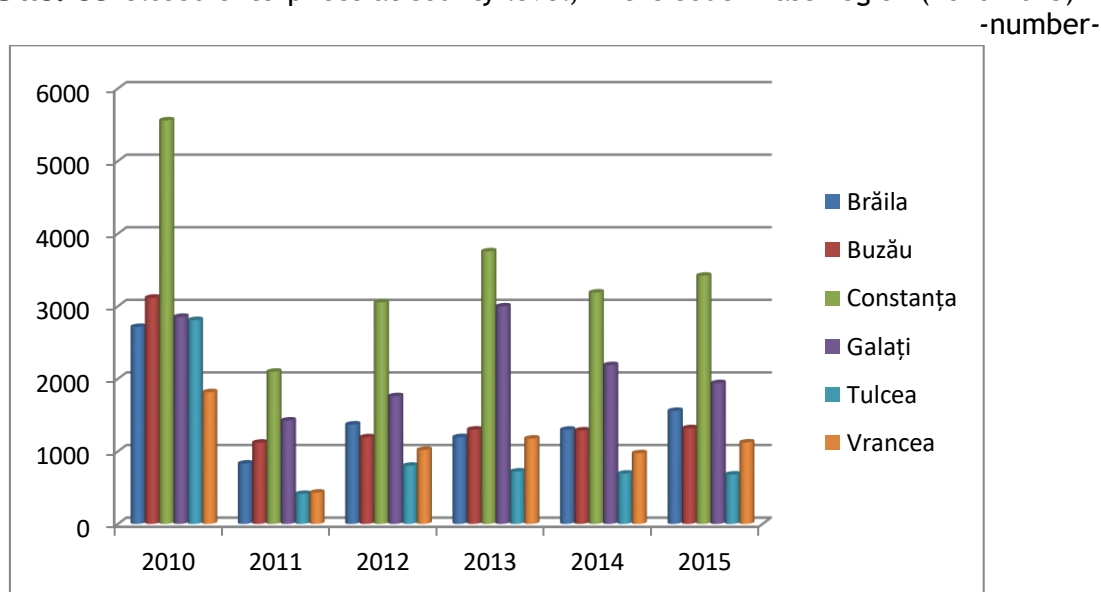
recorded in Tulcea County (5.64% of the regional value). This situation is directly correlated with the number of local active units existing in each county, Constanța occupying the first position, with Tulcea, Vrancea at the opposite side.

Figure no. 59 Closed enterprises at national level (2010-2014)



Source: data processed from the National Institute of Statistics, 2017

Figure no. 60 Closed enterprises at county level, in the South-East Region (2010-2015)



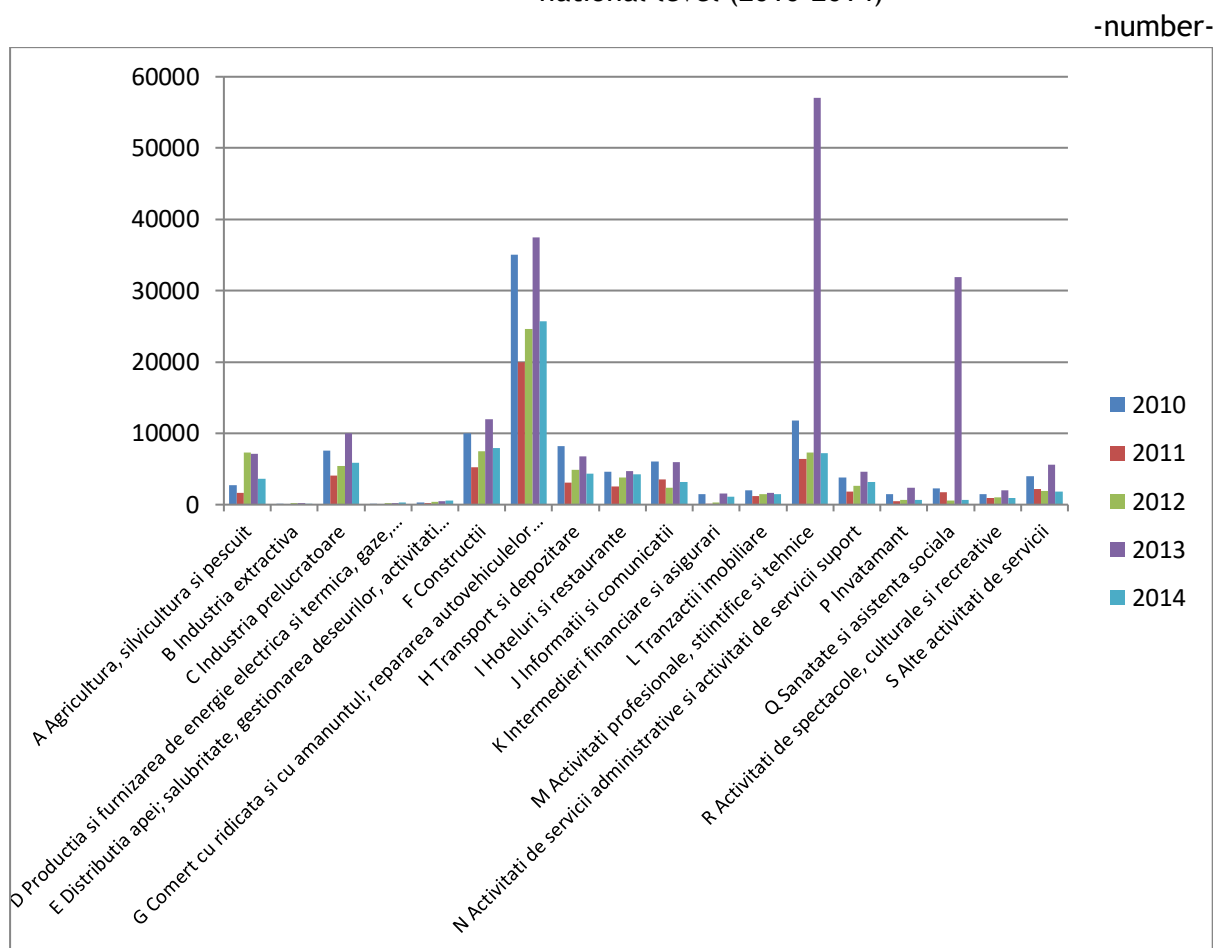
Source: data processed from the National Office Commerce Register, 2017

Analyzing the situation of the number of closed enterprises by sector of the national economy, in 2014 the largest number was registered in the wholesale and retail commerce and repair of motor vehicles and motorcycles, respectively 25,687 closed enterprises. This can be translated into a percentage of over 35% of the total number of closed companies at national level. The sector with the lowest number of closed enterprises in 2014 is the mining industry with a total of 128. Other sectors with a low number of closed companies

are the production and supply of electricity and heat, gas, hot water and air conditioning (302) and water distribution, sanitation, waste management and decontamination activities (542).

It is noteworthy that in 2013 it was registered the highest number of closed companies, especially in the field of professional, scientific and technical activities, in which case the number was higher than that of the closed enterprises at national level in the year 2011.

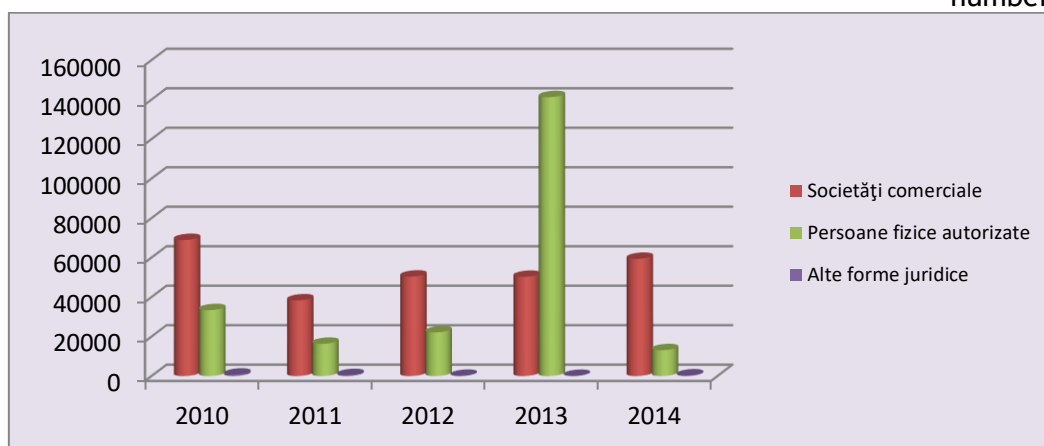
Figure no. 61 Closed enterprises, by sectors of the national economy at NACE section, at national level (2010-2014)



Source: data processed from the National Institute of Statistics, 2017

Considering the legal status of closed companies, most of them were registered as authorized individuals in 2013, respectively 141,231, which can be translated to a percentage of almost 74% of the national total. The situation in 2014 shows that the highest number of closed enterprises were companies (59,359), increasing by about 15% compared to the associated value from 2013. A number of 13,102 units among the authorized individuals were closed, and the fewest closed enterprises are in the "other legal forms" category (333).

Figure no. 62 Number of closed enterprises by legal status, at national level (2010-2014)
-number-



Source: data processed from the National Institute of Statistics, 2017

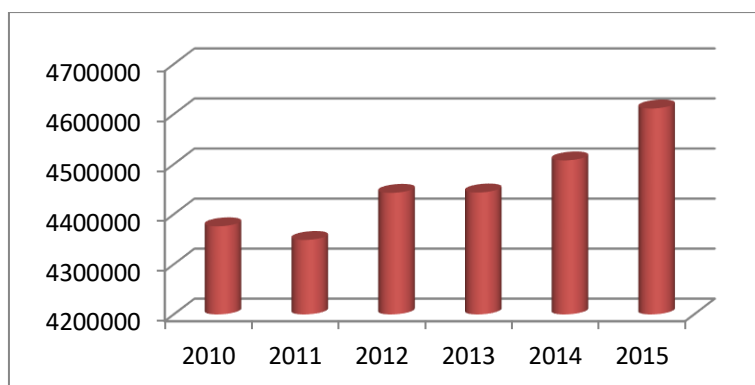
Average number of employees by economic sector

The average number of employees includes persons employed with an employment contract / fixed-term or indefinite service relationship (including seasonal workers, manager or administrator) whose contract of employment / service report has not been suspended during the reference period. The average number is determined as a simple arithmetic mean, resulting from the sum of the daily number of employees, divided by the total number of calendar days.

The number of employees taken into account in the average number includes only those who have been paid.

The period 2012-2015 can be characterized by an evolution in terms of average number of employees at national level, reaching 4,611,395 in the last year analyzed. Compared to 2010, in 2015 there is an increase of 5.10% in the average number of employees.

Figure no. 63 Average number of employees at national level (2010-2015)
-number-

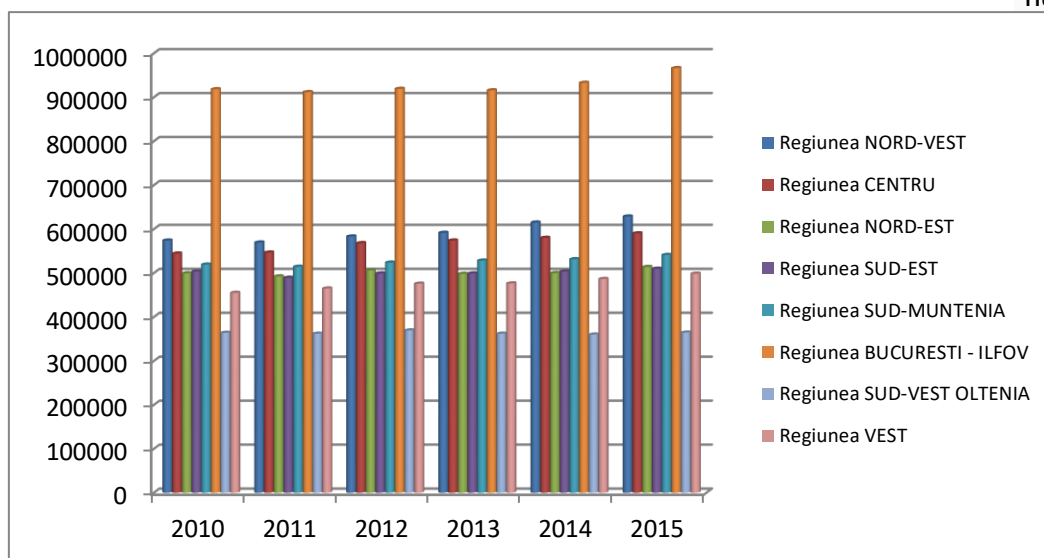


Source: data processed from the National Institute of Statistics, 2017

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Analyzing the situation of the average number of employees by development regions, it can be noticed that the region with the highest number of employees is the Bucharest-Ilfov Region, with a total average number of 966,068 in 2015. The following regions in terms of average number of employees in 2015 are the North-West Region, with a number of 628,425 in 2015 and the Center Region, with 590,125 employees. The region ranked last from this point of view is the South-West Oltenia Region, with 364,313 employees at the end of 2015, followed by the West Region with a number of 498,384 and the South-East Region, with 509,582, which occupies the sixth position at national level and represents 11.05% of the total number of employees in Romania in 2015. In the South-East Region, it can be noticed an improvement in the average number of employees starting from 2013, after having experienced a fluctuation period between 2010 and 2012.

Figure no. 64 Average number of employees by development regions (2010-2015) -number-



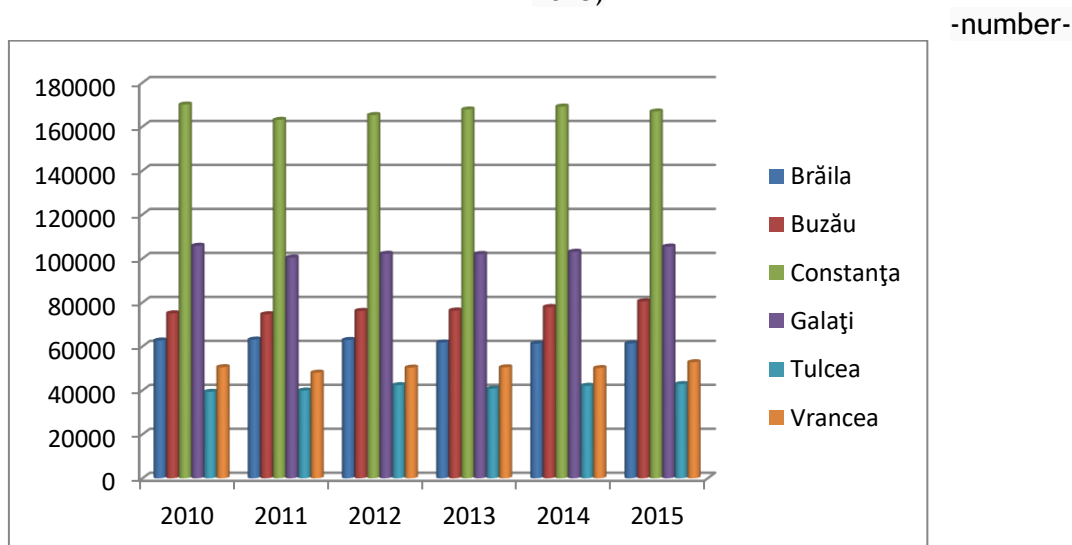
Source: data processed from the National Institute of Statistics, 2017

At the level of the South-East Region, in 2015 it was shown a slight increase in the average number of employees in all counties, compared to the previous year, except for Constanta County, in which case the value decreased from 169,065 in 2014 to 166,819 in 2015. However, the county with the highest average number of employees in 2010-2015 is represented by Constanta, followed by Galati county, with a number of 105,375 at the end of 2015. The counties located on the last places in terms of number of employees in 2015, are Tulcea (42,815), Vrancea (52,774) and Braila (61,332).

Having the highest value of the number of employees in Constanta County can be explained by a number of factors such as: the development of the economic sector and the presence of a large number of foreign investors in the area, the existence of a

significant number of maritime settlements where there is created a high number of jobs, job creation following the implementation of projects funded by European funds (Constanta presented a high rate of accessing funding sources), etc. On the other hand, Tulcea and Vrancea counties have a lower population compared to Constanța, while having smaller settlements and a less developed economic sector than the other counties in the South-East Region.

Figure no. 65 Average number of employees in the South-East Region, by counties (2010-2015)



Source: data processed from the National Institute of Statistics, 2017

The South-East Region occupies the first place at national level in 2015 in terms of the average number of employees working in the water distribution, sanitation, waste management, decontamination activities sector, with a total number of 15,443 employees.

In 2015, agriculture, forestry and fishing activity registered 19,138 employees in the South-East Region, positioning it in the second place (after South Muntenia Region).

The sector of hotel and restaurant services places the South-East Region on the second place in terms of average number of employees at the end of 2015, 55% of the total number being registered in Constanța County.

The counties that record the largest number of employees in agriculture, forestry and fishing in 2015 in the South-East Region are Constanța (4,106), followed closely by Buzău (4,041) and Braila (3,908) counties.

Another sector of activity in which the South-East Region has a high value in terms of average number of employees is the production and supply of electric and thermal energy, hot water and air conditioning. From this point of view, the South-East Region was ranked

third in 2015 with a number of 7,915 employees, exceeded only by South-West Oltenia and Bucharest-Ilfov Regions.

Average number of employees, by activities (sections and divisions) of NACE Rev. 2, gender, development regions and counties

In Romania, in 2015, 1,334,943 employees were registered in the industry sector. Out of these, a significant number of employees were registered in the manufacturing (1,122,321) and mining industries (199,238). Out of the total number of employees at national level, the highest number was recorded in the following sectors: food industry (146,696) and clothing manufacturing (139,532).

The largest share of employees in the industry sector was attributed to the Centre Region (over 16%), followed by the North-West Region (with about 15.9%). The South-East Region registered a total of 141,133 employees in 2015, which represents only 10.5% of the national average. Analyzing the situation in the South-East Region for the main sectors / sub-sectors of the industry, the situation presents as follows:

- **Manufacturing:** there were 114,362 employees (10.18% of the national average of this sector).
 - Clothing manufacturing: The South-East Region ranks second at national level, after the North-East Development Region, with a total number of 24,111 employees in this sector (17.2% of the national average).
 - Metallurgy: In 2015, 8,556 employees were registered in this sector in the South-East Region, which had the largest share at national level in terms of employees in this sector (29.35%).
 - Manufacture of other means of transport: The South-East Region ranks first at national level with a number of 16,354 employees in this sector, accounting for more than half of the total number of employees at national level (52.9%).
 - Repair, maintenance and installation of machinery and equipment: In the year 2015, 9,408 employees (41.9% of the national average) were registered, ranking the South-East region first at national level.
- **Water distribution, sanitation, waste management, decontamination activities:** the number of registered employees in this sector in 2015 at the level of the South-East Region (15,443) represents 15.54% of the national average, the region being ranked first from this point of view.
- **Mining industry:** The South-East Region registered in 2015 a number of 3,613 employees in this sector, representing 6.24% of the national average.

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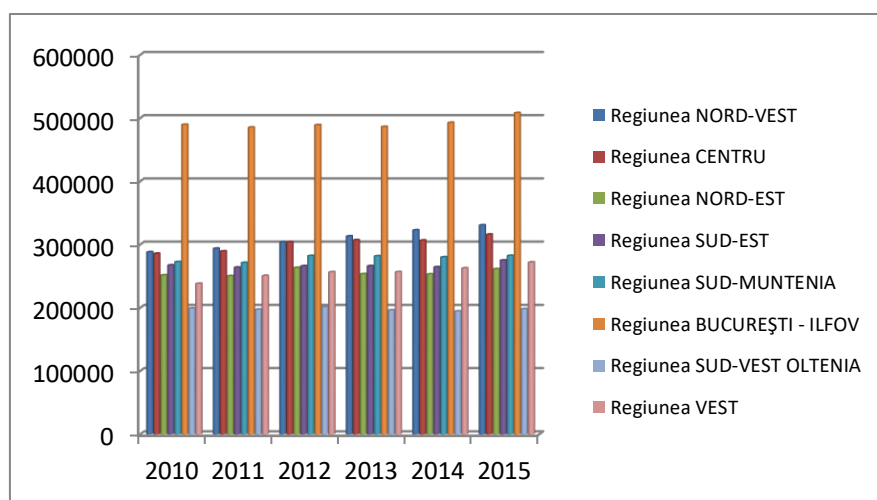
In the South-East Region, out of a total of 14,133 employees registered in the industry sector in 2015, 25.3% belonged to Constanta County, 20.1% to Galati County, 19.4% to Buzau County, 12.68% to Braila County, 63% of Vrancea County and 9.6% of Tulcea County. Segmentation and division of industry reveals a preponderance of the number of employees in the manufacturing and water distribution, sanitation, waste management, decontamination activities. Most of the employees in manufacturing were registered in Constanta (25,215), Galati (23,874) and Buzau counties; for the water distribution, sanitation, waste management, decontamination activities, the same three counties recorded the highest values considering the number of employees (Constanta - 5.710, Buzau - 2.942, Galati - 2.637).

Considering the number of employees by gender registered at regional level in Romania in 2015, it is noted that the male population has a higher share of the total number of employees (52.9%) compared to the female population (47.03%). Most employees are employed in the Bucharest-Ilfov Development Region (507,994 men and 458,074 women) and in 2015 the South-East Region was ranked sixth at national level in terms of number of male employees (274,925) and seventh in terms of female employees (234,657).

At the level of the counties of the South-East Region, the largest share of both female and male employees was registered in Constanta County. In almost all counties, the number of male employees is higher than the number of female employees, with the exception of Vrancea County where female employees (26,716) are more numerous than male employees (26,058).

Figure no. 66 Average number of male employees at regional level (2010-2015)

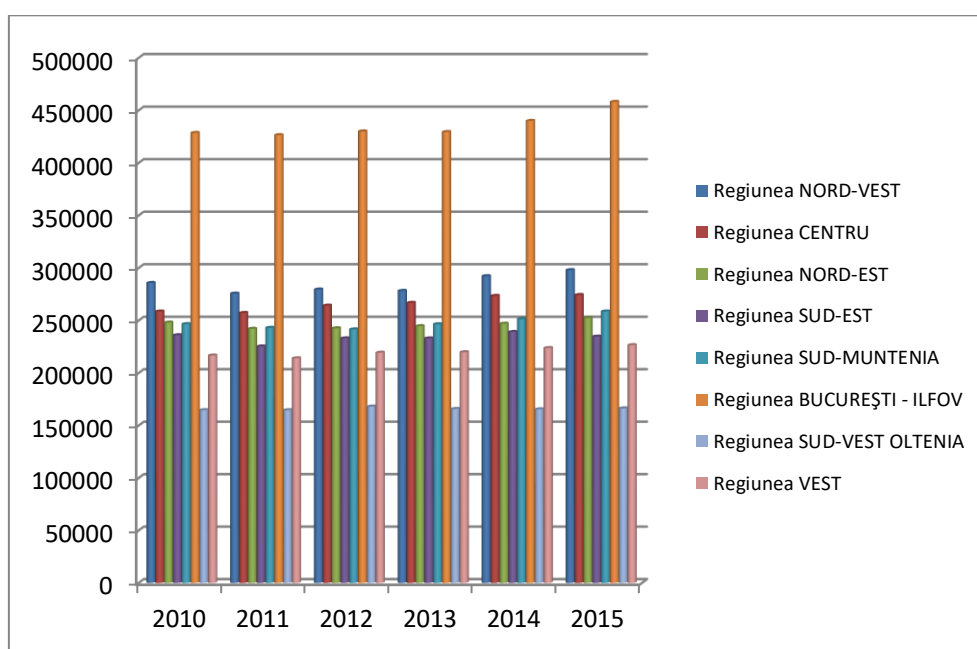
- number -



Source: data processed from the National Institute of Statistics, 2017

Figure no. 67 Average number of female employees at regional level (2010-2015)

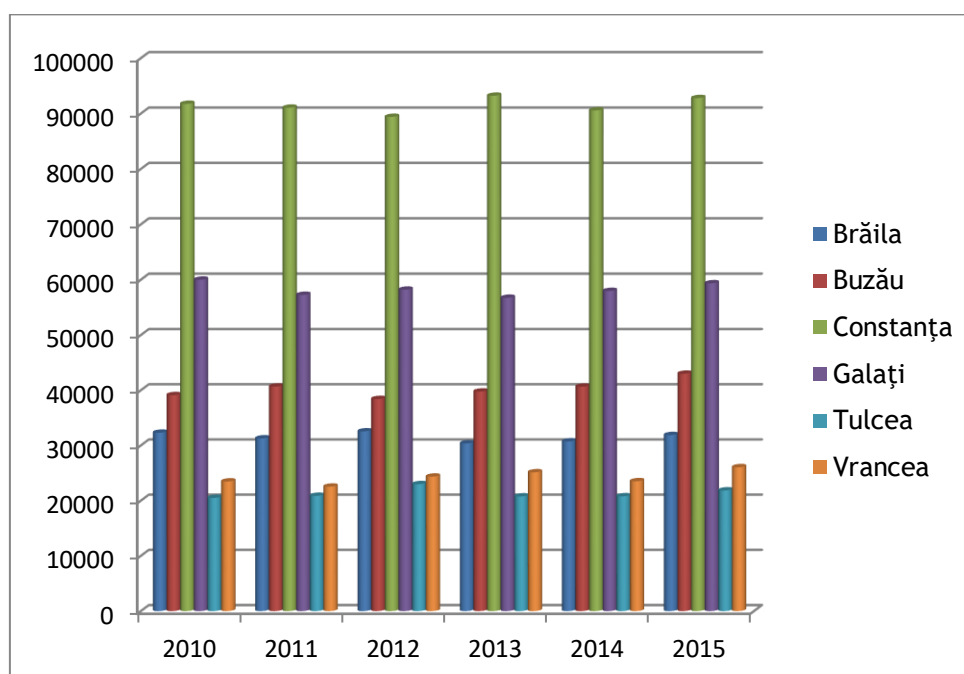
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Source: data processed from the National Institute of Statistics, 2017

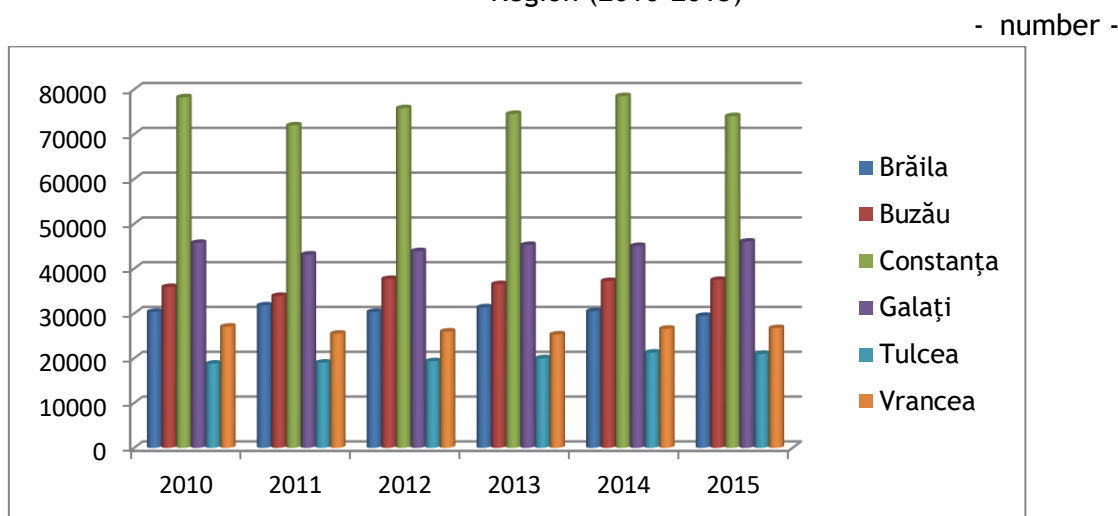
Figure no. 68 Average number of male employees in the counties of the South-East Region (2010-2015)

- number -



Source: data processed from the National Institute of Statistics, 2017

Figure no. 69 Average number of female employees in the counties of the South-East Region (2010-2015)



Source: data processed from the National Institute of Statistics, 2017

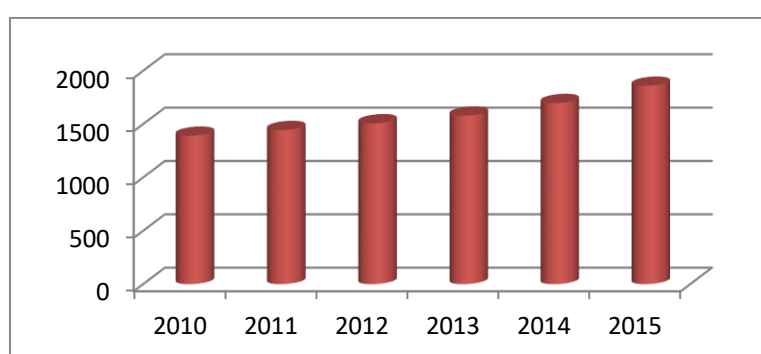
Average monthly net wage per economic activities

The average monthly net wage is obtained by subtracting from the gross nominal earnings the tax, the contribution of the employees to the health social insurance, the individual contribution of state social insurance and the contribution of the employees to the unemployment insurance budget.

The average monthly net earnings is the ratio between the net amounts paid to the employees by the economic agents in the reference month, regardless the period and the average number of employees.

Starting with 2010, it can be noticed a steady evolution of the average monthly net wage at national level, a trend maintained throughout the analyzed period, ie before 2015. Compared with 2010, when the average monthly wage was 1.391 Ron (net), in 2015 it reached 1.859 Ron (net), registering an increase of 468 Ron compared to the beginning of the reference period.

Figure no. 70 The average monthly net wage, at national level



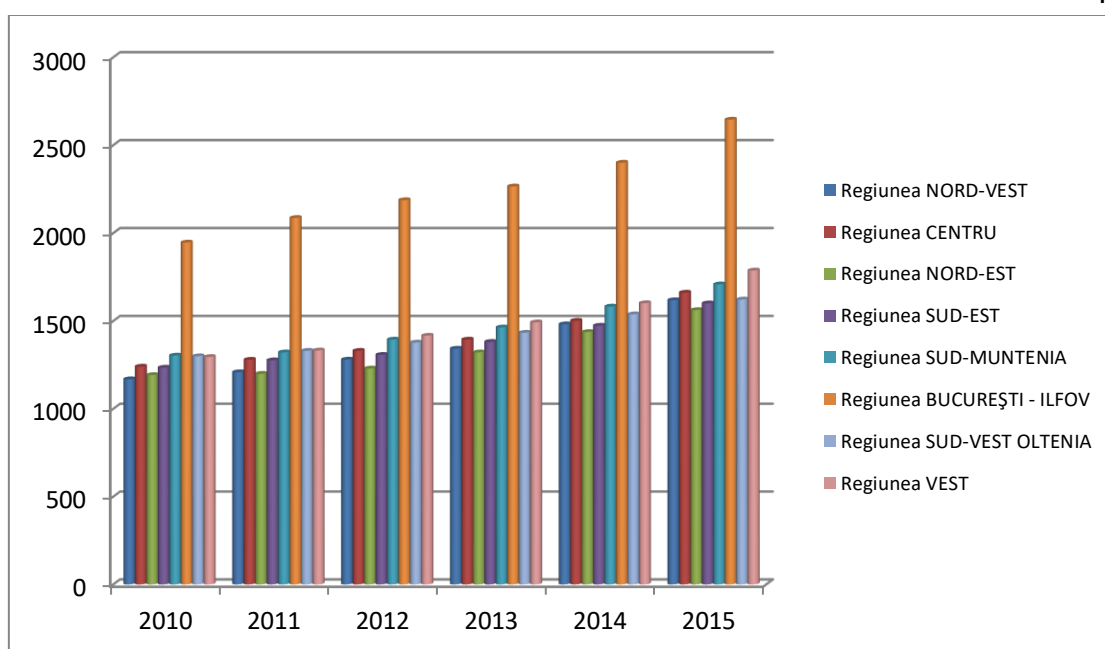
Source: processed data from the National Institute of Statistics 2017

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The evolution of the average monthly salary level is felt in the same way at the regional level during the period 2010-2015, the development regions being characterized by an upward trend of the salary earning. The regions with the highest salary in 2015 are Bucharest-Ilfov Region, with 2.645 Ron, West Region, with 1.787 Ron, followed by the South-Muntenia Region, with 1.708 Ron. The most underdeveloped regions in terms of wages are North-East Region, with 1.562 Ron, and South-East Region, with 1.600 Ron. In 2015, the value of the average monthly net wage of the South East Region was 86% of the national average monthly net wage for the year 2015, ranking the South-East Region below the national average.

Figure no. 71 The average monthly net wage per development regions (2010-2015)

- Ron -

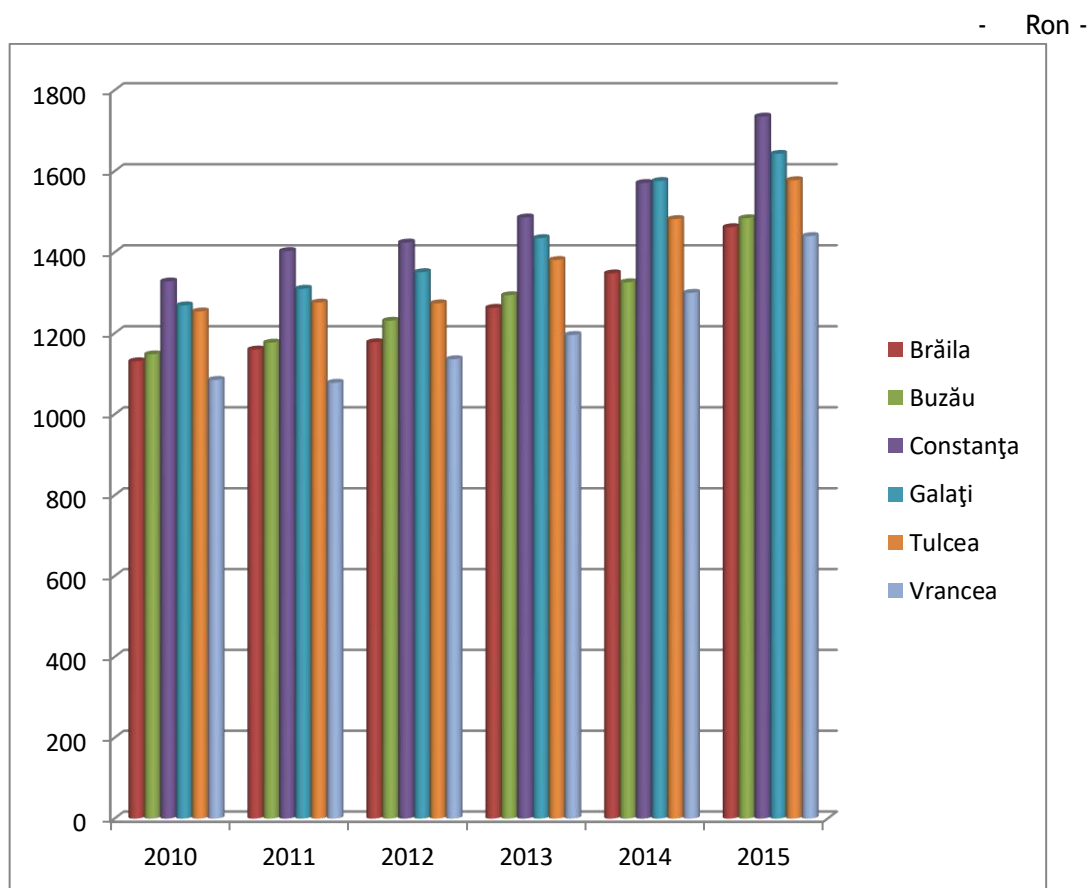


Source: processed data from the National Institute of Statistics 2017

Analyzing the average monthly wage at the level of the South-East Region in the period 2010-2015, it can be noticed an increase of these values at the level of each county, the counties with the highest salary level in 2015 being Constanta, Galati and Tulcea. Constanta county records an increase of the average monthly net salary as compared to 2010 by 407 Ron, Galati county an increase of 374 Ron, and Tulcea county an increase of 324 Ron. The county with the lowest level of the average monthly salary at the end of 2015 is Vrancea, with 1.440 Ron net, followed by Braila and Buzau counties, with 1.462 Ron net and 1.484 Ron net.

An explanation for the increased wages in the counties of Constanta, Galati and Tulcea is the existence of specialized areas of activity in these areas (harbor and maritime activities, specialized technical activities - for example the Galati steel factory).

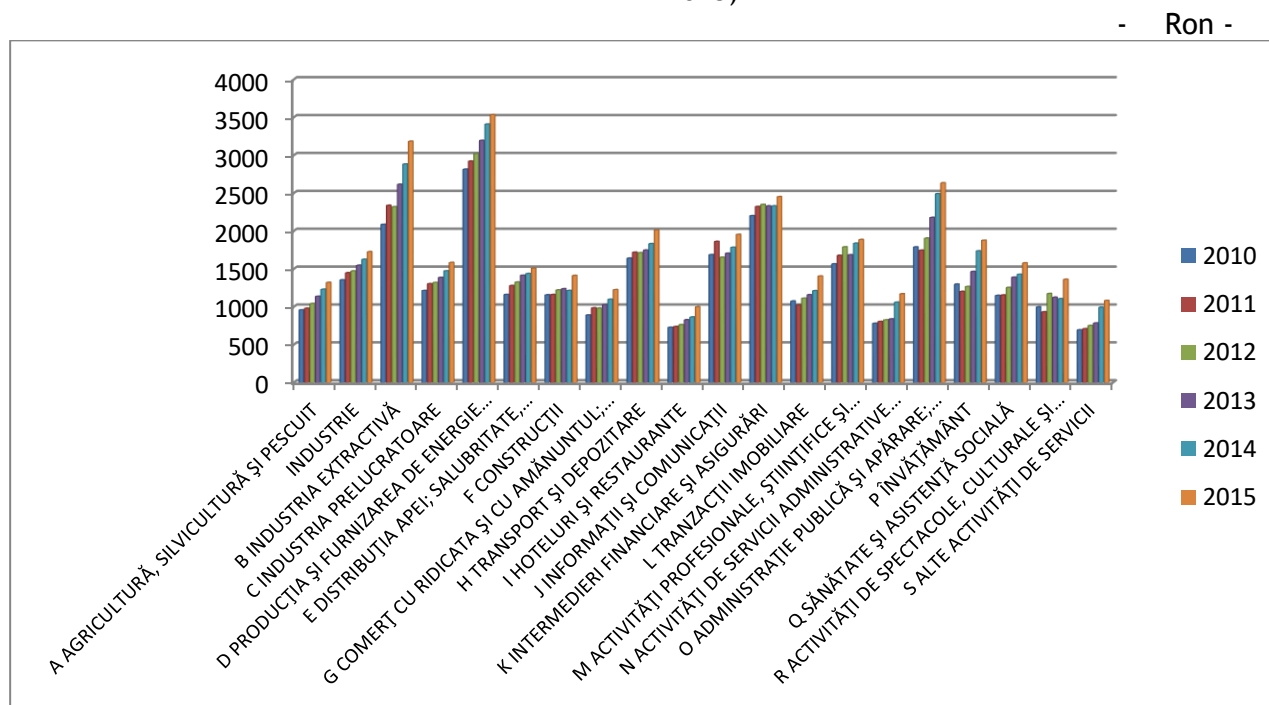
Figure no. 72 The average monthly net wage in South-East Region, per counties (2010-2015)



Source: processed data from the National Institute of Statistics 2017

The economic sector with the **highest average monthly wage in the South-East Region in 2015** was the **production and supply of electric and heat energy, gas, hot water and air conditioning**, a sector that registered an average monthly salary of **3.532 Ron net**. The next sectors of activity with high salary gains are those of the extractive industry, with an average monthly salary of 3.181 Ron net and public administration, defense and social security in the public system, with 2.632 Ron net. In the ranking of the sectors with the lowest average monthly salary level, there are the hotels and restaurants, with 995 Ron net, other services, with 1.079 Ron net and the activities of administrative and support services, with 1.167 Ron net.

Figure no. 73 The average monthly net nominal salary, per activities of the national economy at the level of NACE Rev.2 section, in the South-East Region (2010-2015)

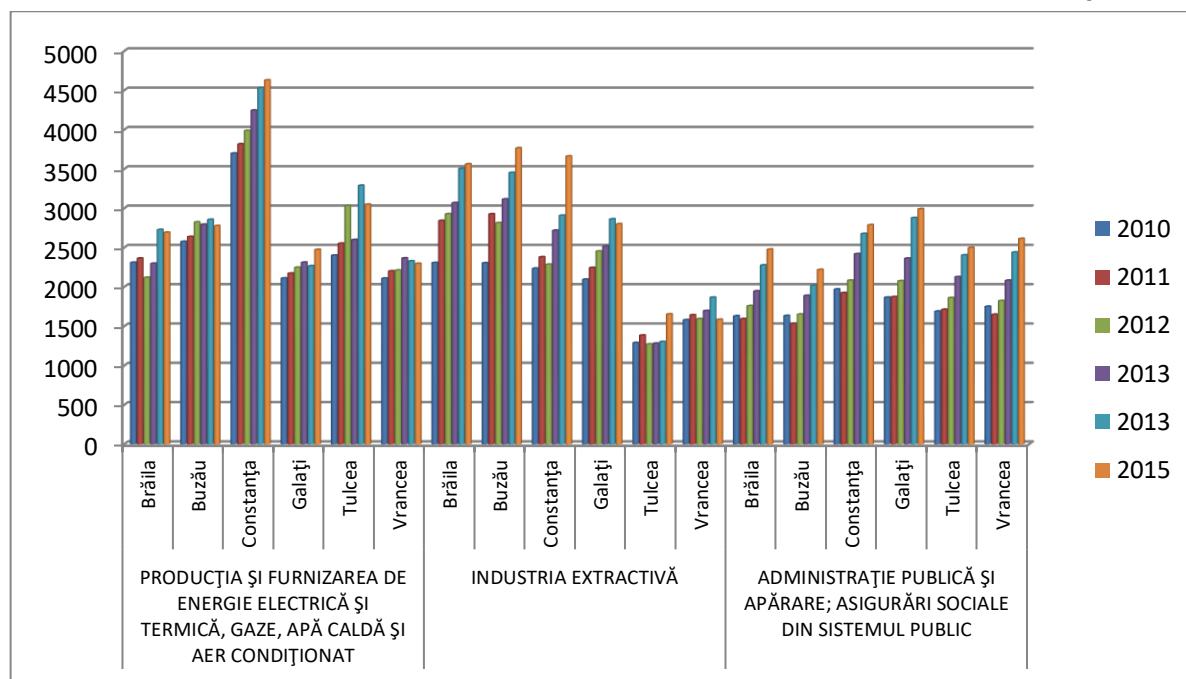


Source: processed data from the National Institute of Statistics 2017

The sector of production and supply of electric and heat energy, gas, hot water and air conditioning generated the highest average monthly wage in 2015 in Constanta county (taking into account the existence of photovoltaic parks and wind turbines in this county), reaching the value of 4.628 Ron net and the lowest in Vrancea County, with 2.295 Ron net. As for the sector of extractive industry, Buzau county ranks first in the rankings of the counties with the highest salary level in 2015, with an average monthly salary of 3.765 Ron while Vrancea occupies the position with the lowest salary, respectively 1.584 Ron. In the sector of public administration, defense and social security in the public system, the highest average monthly salary in 2015 was recorded in Galați county, with 2.990 Ron net. The lowest value of the salary in this sector was registered by Buzău County, with 2.218 Ron net, but this does not represent a low level compared with the national average.

Figure no. 74 The sectors of activity with the highest average monthly salary, at the level of the South-East Region, per counties (2010-2015)

- Ron -

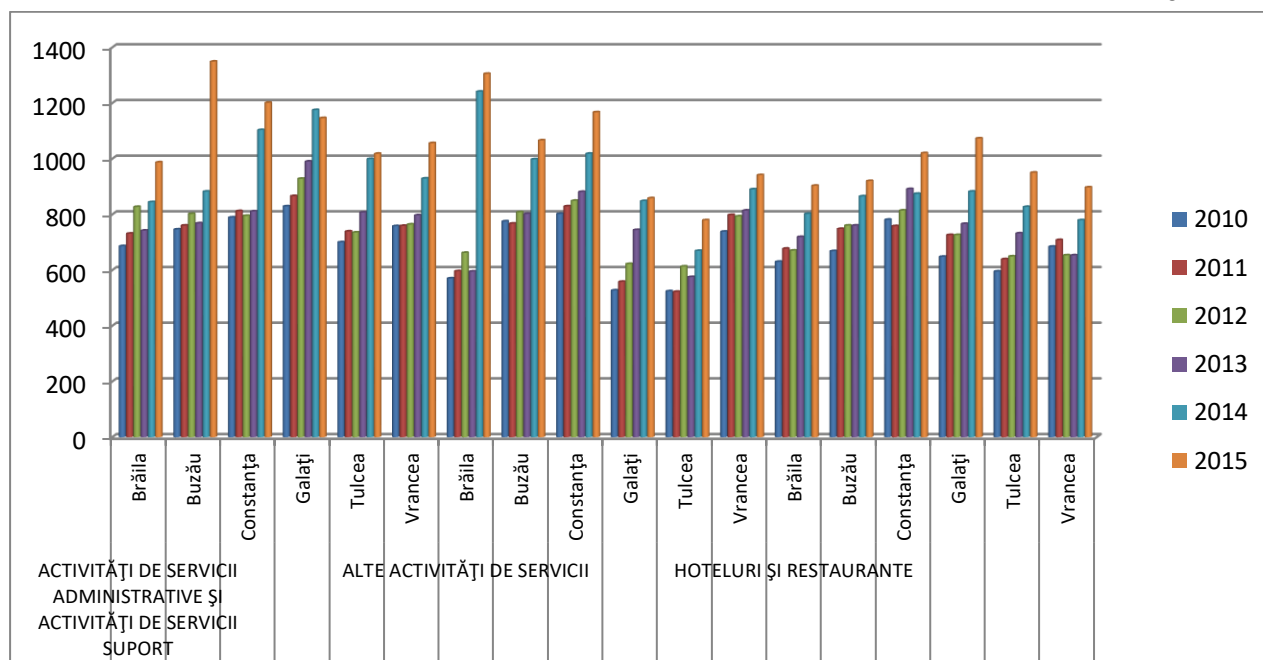


Source: processed data from the National Institute of Statistics 2017

The administrative and support service activities generate the highest average monthly salary in 2015 in Buzau county, with a value of 1.349 Ron net, the lowest level being recorded in Braila county, with 987 Ron net. In the category of other activities of the national economy, in 2015 the highest average monthly salary was of 1.305 Ron net, in Braila, and the lowest in Tulcea county, with a value of 779 Ron net. The sector with the lowest salary level in the South-East Region, ie the hotels and restaurants, registered the highest salary value in 2015 in Constanta county, with 1.020 Ron net (due to the specificity of the county that facilitates the seasonal tourism with a high number of accommodation units and restaurants, compared to the other counties of the region), and the lowest in Vrancea, respectively 897 Ron net.

Figure no. 75 The sectors of activity with the lowest level of the average monthly salary, at the level of the South-East Region, per counties (2010-2015)

- Ron -



Source: processed data from the National Institute of Statistics 2017

d) Investments in the South-East Region

The investment sector is a particularly relevant element for the economic development of any region, having a direct effect in the process of modernizing the business environment, transposed into the development of advanced technologies, information transfer, modernization of equipment and the adoption of new quality standards.

Direct Foreign Investments

The Direct Foreign Investments (DFI) are important forms of materializing and expressing the process of market globalization, which determine at least a number of endogenous economic growth factors as well as financial flows between countries.

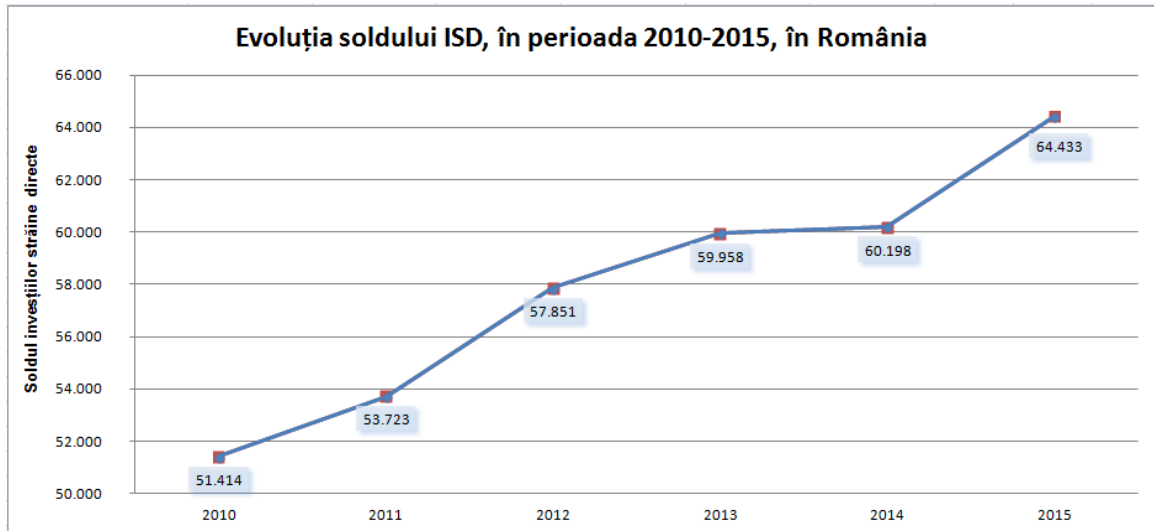
The Direct Foreign Investments are expenditures for the creation or purchase of economic units, the renewal and expansion of existing ones, with the aim of obtaining future incomes to foreign investors. These are long-lasting international connections between a resident structure and a non-resident structure, and basically require the achievement by the entrepreneur of a significant managerial influence in the enterprise where he has invested.

The Direct Foreign Investments components are the share ownerships of non-resident investors holding at least 10 percent of the subscribed capital of resident enterprises, the

profit reinvested by them, as well as the debt-type instruments (e.g. loans) between investors or the group which they are part of and the enterprises they invested in.⁴

Figure no. 76 FDI evolution in 2010-2015 period at national level

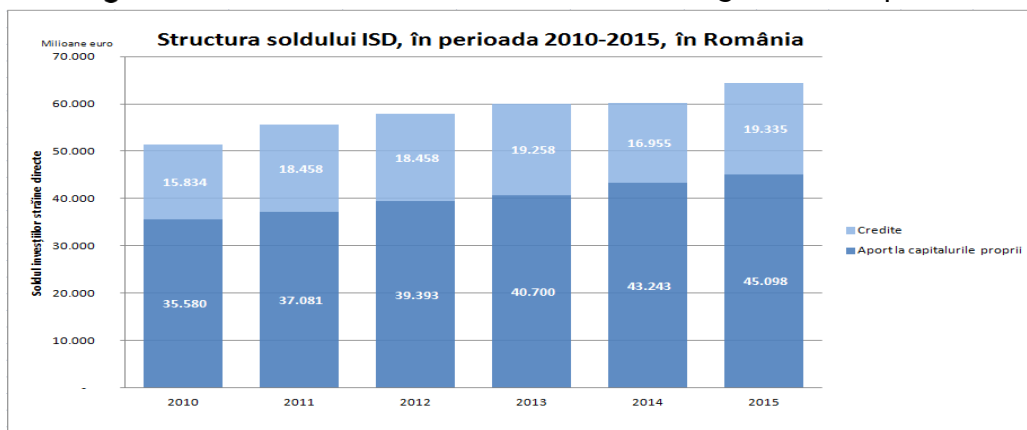
- million euro -



Source: processed data from Foreign Direct Investments in Romania (www.bnr.ro)

The statistical data reflected in the above figure shows that in the 2010-2015 period the trend of the Foreign Direct Investment balance was an increased one from 51.414 million euro in 2010 to 64.433 million euro in 2015.

Figure no. 77 Structure of the FDI balance during 2010-2015 period



Source: processed data from Foreign Direct Investments in Romania (www.bnr.ro)

According to the above graphic, it can be noticed that the increase of the Direct Foreign Investments between 2010 and 2015 was mainly due to the equity contribution (including reinvested earnings) of direct foreign investment enterprises, approximately 70% of the

⁴ <http://www.bnr.ro/Investitii-directe---principiul-direc%C8%9Bional-12332.aspx>

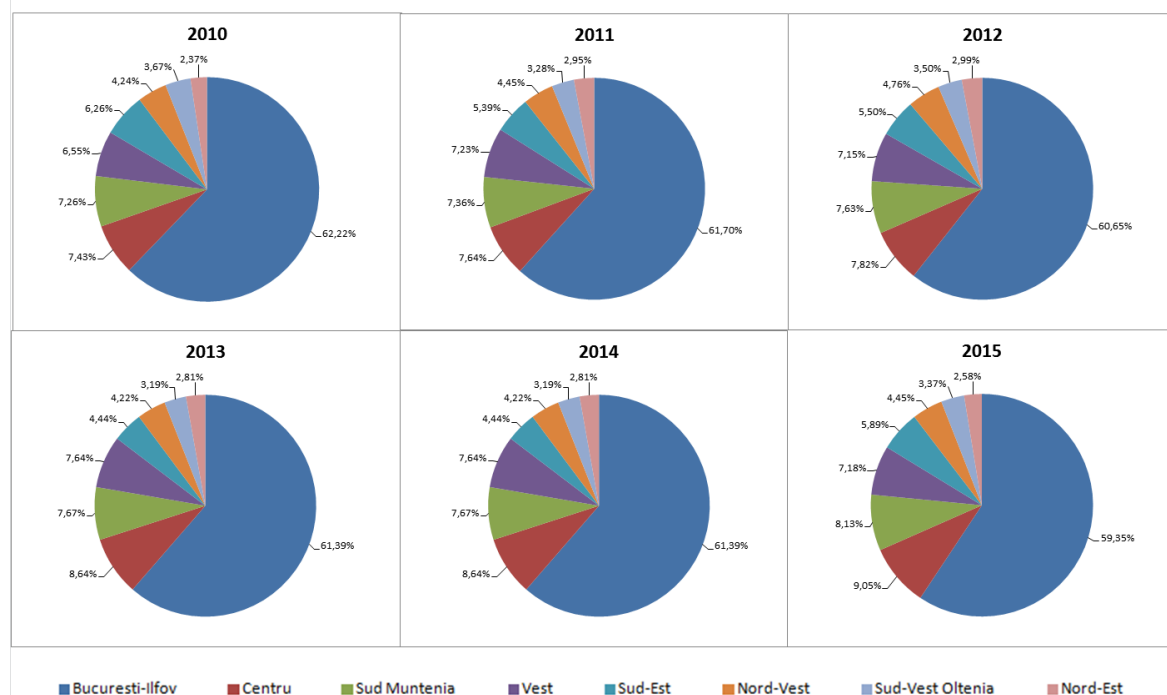
final balance of FDI (the largest proportion being recorded in 2014 - 71,83% and the lowest - 68,09% in 2012).

In what concerns the amount of credits received by enterprises from foreign direct investors, it can be said that this represents approximately 30% of the value of the final FDI balance over the period considered in the analysis.

Regarding the distribution of Foreign Direct Investments per development regions of Romania, it can be seen that the Bucharest-Ilfov Region is the most targeted by foreign investors, approximately 60% of the total FDI, in the 5 years of the analysis. This is followed by the Center Region, which in 2015 registered a value of 9% of the total FDI, of almost one percentage point higher than the one in 2010. In all the analyzed years, the North-East Region recorded the lowest share of total foreign direct investment (2,4% in 2010, reaching 2,6% in 2015). With regard to the South-East Region, the share of FDI has decreased over the analyzed period, from 6,26% in 2010 to 5,89% in 2015.

In antithesis with the performance achieved by the Center Region in 2013, there is a significant decrease in the FDI balance, of about 55%, in the South-East Region, compared to the previous year, 2012 in relative value, the decrease in the volume of investments representing more than 2 million euro, thus being registered the lowest FDI stock after 2005, ie 2.529 million euro.

Figure no. 78 The evolution of the FDI structure per development regions in 2010-2015



Source: Own calculations based on Foreign Direct Investments in Romania (www.bnr.ro)

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According to the National Bank of Romania, the first five countries ranked according to the share held in the FDI balance at 31 December 2015 are: Netherlands (25%), Austria (14,2%), Germany (12,4%), Cyprus (6,9%) and France (6,7%).

From territorial point of view, the FDI orientation was observed mainly towards the Bucharest-Ilfov Development Region (59,3%), other development regions that attracted an important volume of FDI being the Center Region (9,0%), the West Region (8,1%), the South-Muntenia Region (7,2%), the North-West Region (5,9%). It is noticed that FDI have been located from territorial point of view according to the registered office of the direct investment enterprises, which is not always the place of the economic activity.

The South-East Region occupies the second before last place in the regional ranking, with only 4,5% of the total investment value in 2015.

Gross investments of the active local units at regional and national level during 2010-2015

The enterprise is a group of legal units that are constituted as an organizational entity for the production of goods, commercial services or services of social interest, which have a decision-making autonomy, especially for securing its current resources. An active enterprise is the entity that is economically active (during the analyzed period), respectively performing goods or services, recording expenses and elaborating a balance sheet.

The local unit is an enterprise or a part of it (workshop, factory, warehouse, office, mine or station etc.) located at an identifiable address⁵.

Investments are the amount of investments made during the reference period for all tangible goods purchased from third parties or own-account products with a service life of more than 1 year⁶.

The gross investment in tangible goods represents the investment in all tangible goods over the reference period. There are included new fixed assets and existing fixed assets, whether purchased from third parties, acquired under a finance lease (ie the right to use a durable good for a rental payment during a predetermined and relative period) or produced for their own use (ie capitalized production of tangible fixed assets), which have a service life longer than one year, including non-produced tangible goods such as land. The duration threshold of using a good that can be capitalized may be increased

⁵ National Institute of Statistic, <http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=ro&ind=INT101G>

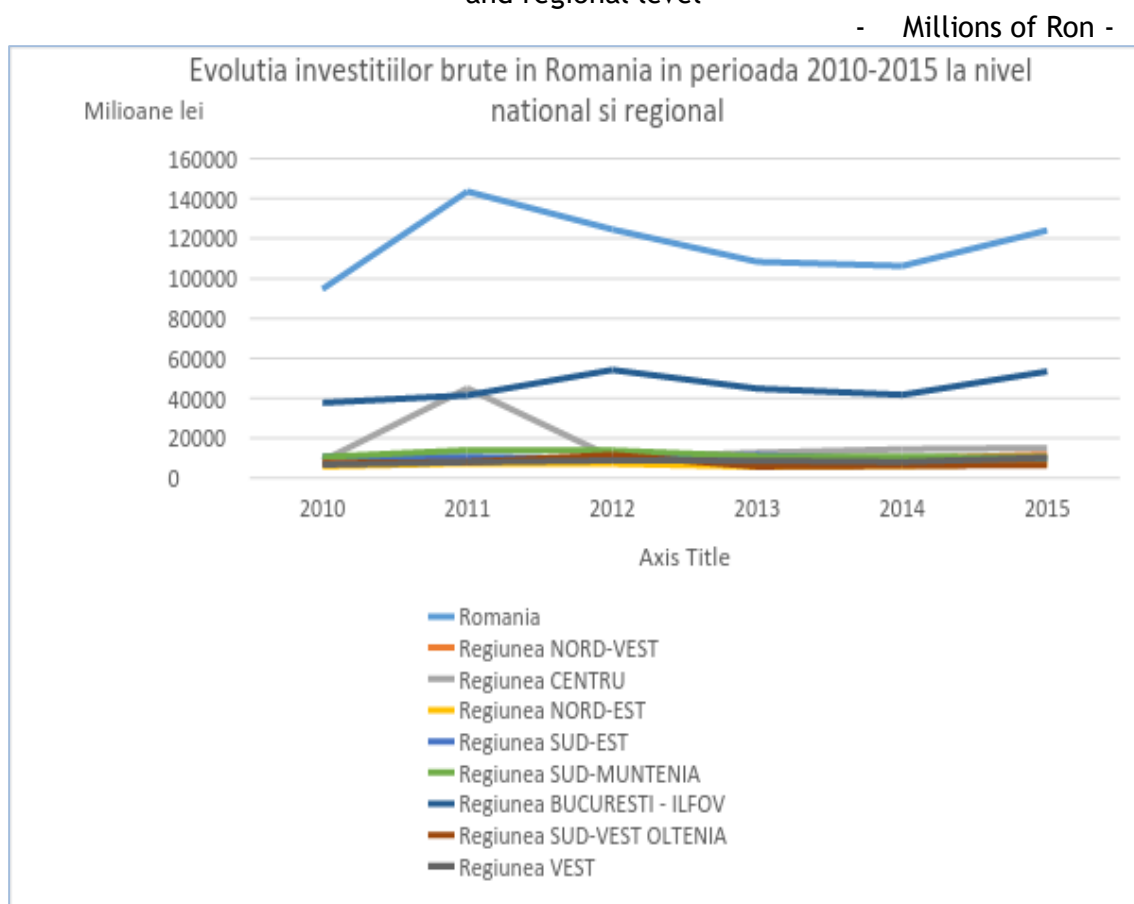
⁶ National Institute of Statistic
http://colectaredate.insse.ro/metadata/search_indicator.htm?action=viewCardFromResearch&selection=I&indicator=329

according to the company's accounting practices, where such practices require a period of use more extended than the one-year threshold indicated above⁷.

Observation: The net investment is the expenditure incurred for construction, installation and assembly works, purchase of equipment, means of transport, other expenditures for the creation of new fixed assets, for the development, modernization, reconstruction of the existing ones and the value of the services related to the property transfer of existing fixed assets and land (notary fees, commissions, transportation costs, embarkation/disembarkation etc.).

The evolution of gross investment in tangible goods in local units at national level and per development regions

Figure no. 79 The evolution of gross investments in Romania during 2010-2015 at national and regional level



Source: processed data from the National Institute of Statistics 2017

The previous figure shows that at national level (total), the gross investments show an exponential growth in the period 2010-2011, from approximately 95.000 million Ron to

⁷ National Institute of Statistic, <http://statistici.insse.ro/shop/index.jsp?page=tempo3&lang=ro&ind=INT105D>

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143.530 million Ron. From 2012 to 2014, the gross investment decreased by approximately 20.000 million Ron.

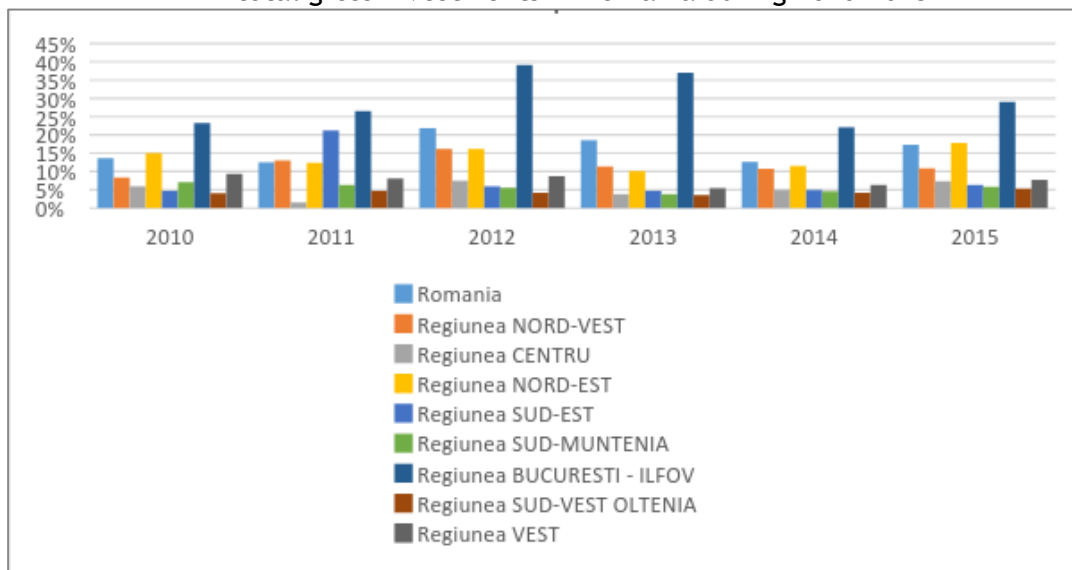
In what concerns the evolution at regional level, the highest level of gross investment is found throughout the analyzed period in the Bucharest-Ilfov Region, followed by the Center Region, while the minimum investment was noticed in the North-East Region.

The evolution of gross investments in Romania during 2010-2015 per sectors of activity, at national and regional level

In the South-East Region, the share of investment in industry decreased from 63% in 2010 to 49% in 2015. This trend is noticed in all the development regions, except for the Center Region, where the share increased from 55% in 2010 to 62% in 2015.

The graphic below shows that the share of gross investment in construction increased from 5% in 2010 to 6% in 2015.

Figure no. 80 The evolution of the share of gross investments in **construction sector** in total gross investments in Romania during 2010-2015



Source: processed data from the National Institute of Statistics 2017

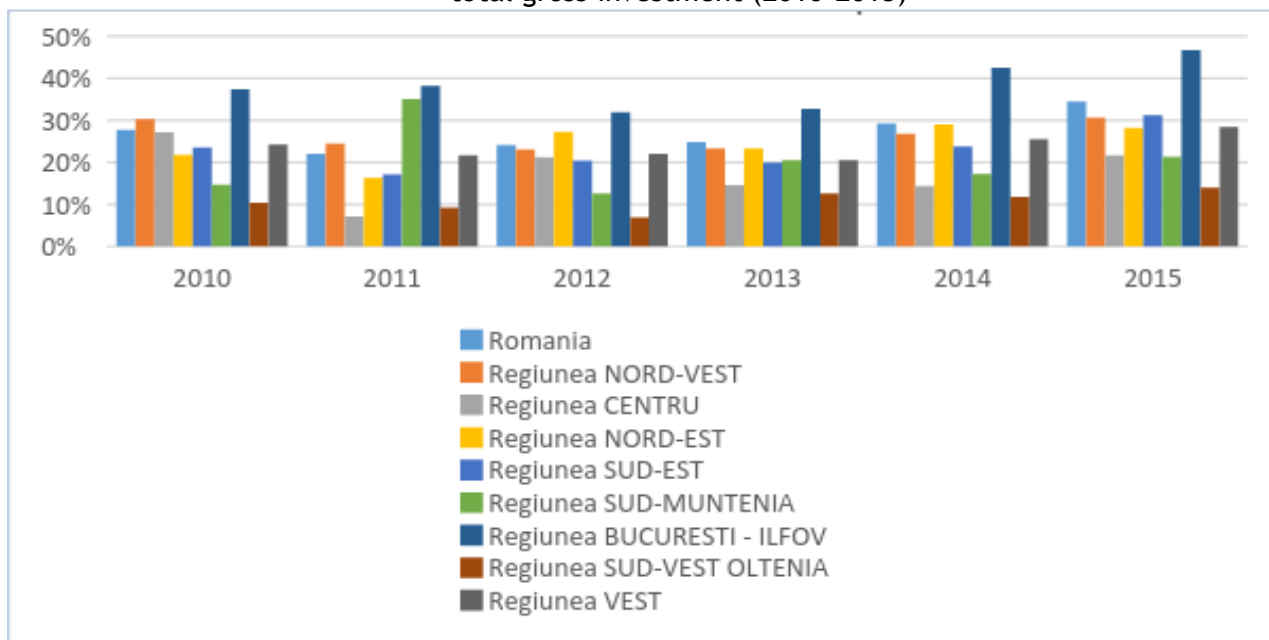
In what concerns the gross investments in the construction sector, the largest investments were made at the level of the Bucharest-Ilfov Region and North-East Region during the analyzed period.

On the other hand, the lowest share of construction investments is found in the South-West Oltenia Region, with an average of 4% of total gross investment.

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Unlike the trend of investment in industry, the trend is growing in services. In the South-East Region, the share of investment in services increased from 24% in 2010 to 31% in 2015.

Figure no. 81 The evolution of gross investment share in **services sector** compared to total gross investment (2010-2015)

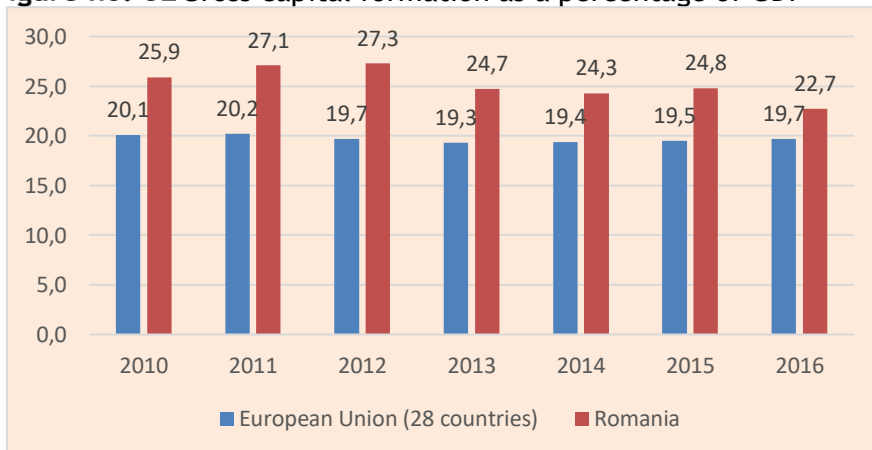


Source: processed data from the National Institute of Statistics 2017

In the graphic above, it can be seen the evolution of the gross investment ratio in services in relation to the total gross investment in the period 2010-2015.

It is noticed that in Bucharest-Ilfov region, the investment in services exceeded the 40% threshold in 2014 and 2015, while in the South-West Oltenia Region the investment in services averaged 10% of total gross investment.

Figure no. 82 Gross capital formation as a percentage of GDP



Source: processed data from Eurostat 2017

It is noticed that in Romania the situation is better compared to the European average for all the years of the analysis. Although the trend is descending both at European and national level, the share of GDP for investment is higher in Romania compared to the European average, varying from 25,9% in 2010 to 22,7% in 2015.

e) The comparative advantages of the South-East Region

In order to measure the comparative advantages of the South-East Region, it was analyzed a set of indicators that would provide an overview of the volume of imports and exports, the trade balance and the Revealed Comparative Advantage (RCA) index, proposed by Balassa. All data required for the calculation of the indicators were taken from the National Institute of Statistics.

Imports and exports per product group according to the Combined Nomenclature

Romania's foreign trade includes all the material goods that are changing between Romania and other countries, with the objective of importing direct goods for consumption; the imported goods removed from customs warehouses or free zones in order to be released for consumption; the export of domestic products and the export of imported goods declared for domestic consumption. There are also included: temporary imports of foreign goods for processing inside the country (active processing), exports of compensating products after processing in the country, temporary exports of goods for processing in other countries (passive processing), imports of compensating products after processing outside the country and imports and exports of goods in financial leasing.

The exported and imported goods are classified according to the Combined Nomenclature (CN), which forms the basis of the Common Customs Tariff.

The values of the data are expressed: for exports in FOB prices and for imports in CIF prices. The FOB (Free on Board) price is the price from the frontier of the exporting country, which includes the value of the goods, all transport costs to the point of embarkation, as well as all the taxes that the goods have to bear in order to be shipped on board. The CIF (Cost, Insurance, Freight) price is the price from the frontier of the importing country, which includes both the components of the FOB price and the cost of international insurance and transport.

Table no. 6 Groups of products according to the combined nomenclature

I. Live animals and animal products
II. Vegetable products
III. Animal or vegetable fats and oils
IV. Food, beverages and tobacco
V. Mineral products
VI. Chemical products
VII. Plastics, rubber and articles thereof
VIII. Raw leather, tanned leather, fur and articles thereof
IX. Wood products, except furniture
X. Paper and articles from it
XI. Textiles and textile articles
XII. Footwear, hats, umbrellas and similar articles
XIII. Articles of stone, plaster, cement, ceramics, glass and other similar materials
XV. Common metals and articles thereof
XVI. Electrical machinery, devices and equipment; devices for recording or reproducing sound and images
XVII. Transport means and materials
XVIII. Optical instruments and devices
XX. Various goods and products
XXII. Other products not elsewhere specified

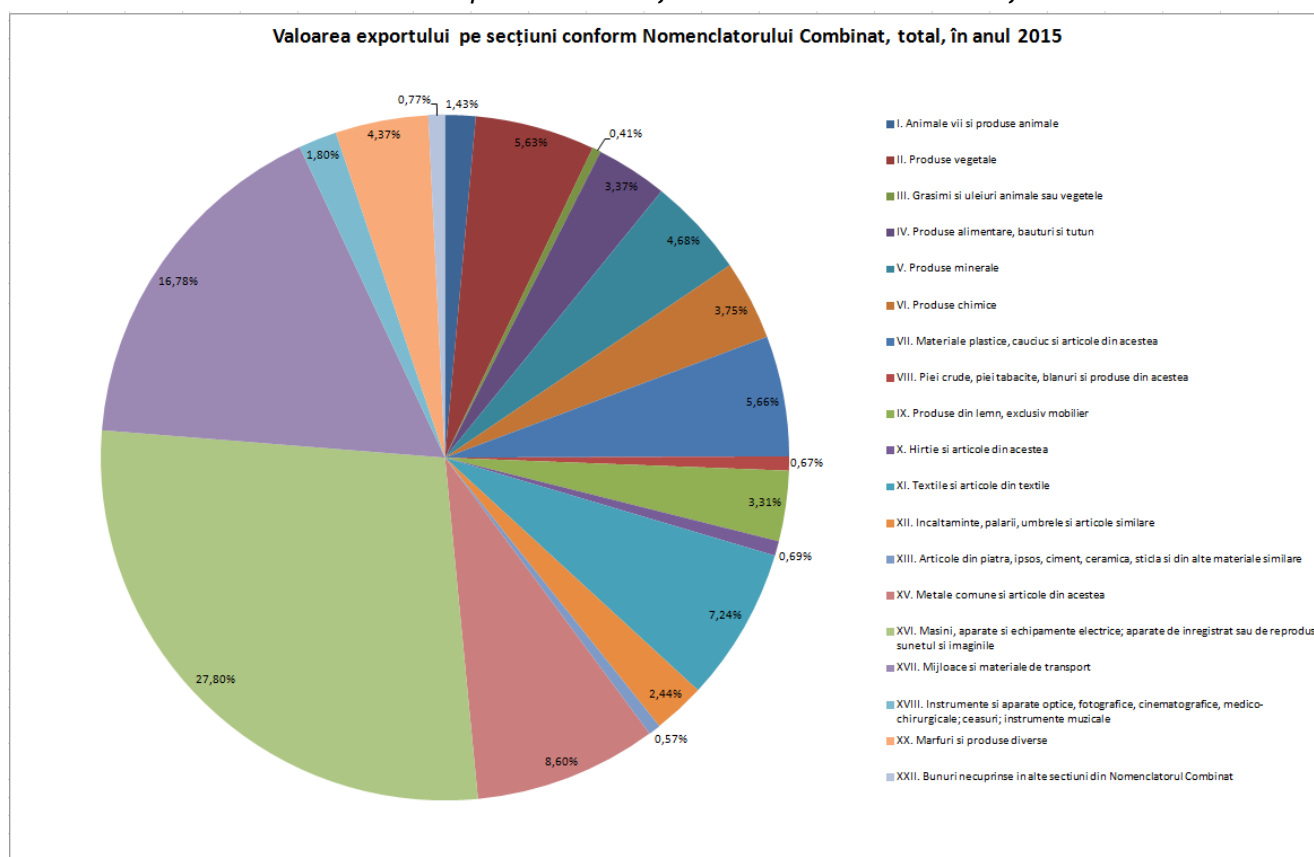
Source: National Institute of Statistics 2017

Most of the CN-related groups recorded a larger share in the year 2015 compared to 2010 in terms of exports. In what concerns Group V (Mineral Products), it can be noticed a decrease in exports by about one percentage point.

From the analysis of the statistical data, it can be noticed that the majority of NC groups registered a higher share in 2015 compared to 2010, in terms of import. Concerning Group X (Paper and articles thereof), it can be noticed a decrease in the import.

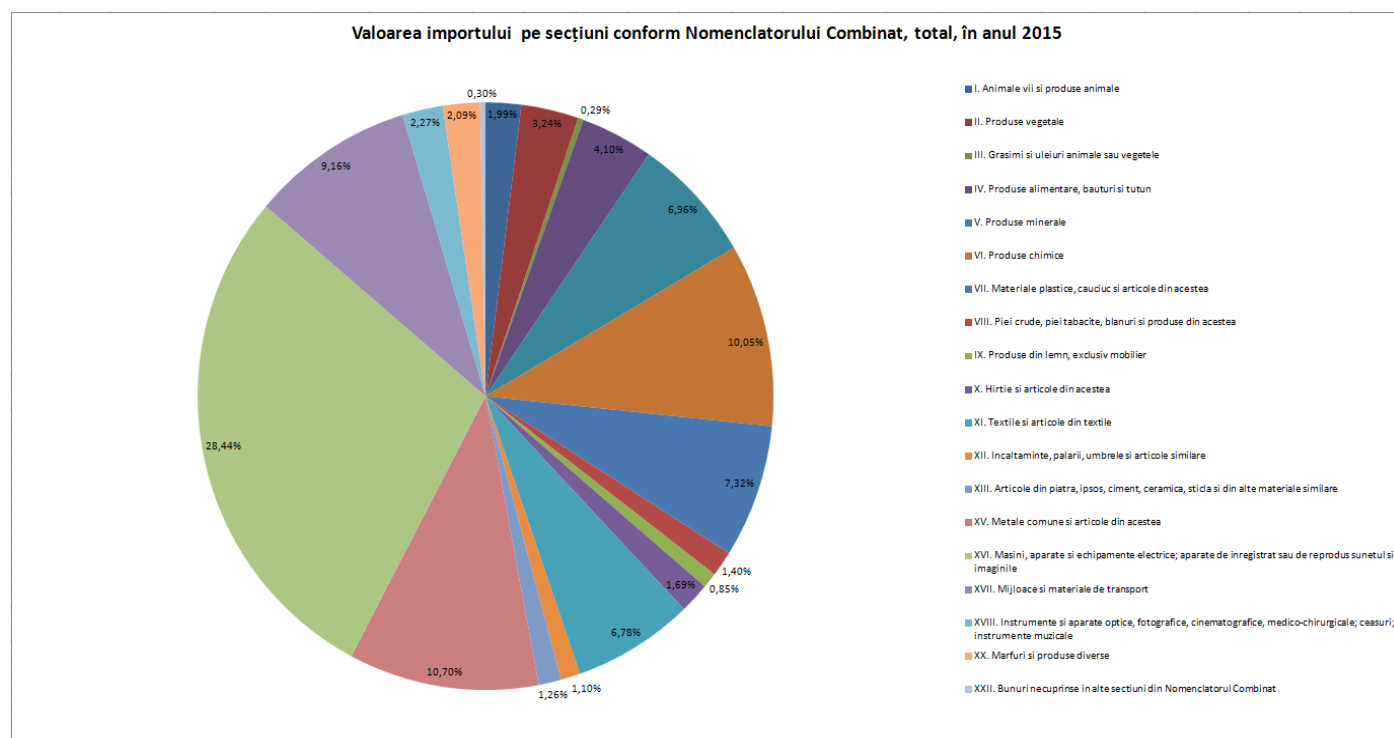
Figure no. 83 Share of exports by sections according to the Combined Nomenclature in 2015 at national level

Source: processed data from the National Institute of Statistics 2017



The chart shows that the largest share in terms of exports is held by group XVI - Electrical machinery, devices and equipment; devices for recording or reproducing sound and images (27,8%), followed by Group XVII - Transport means and materials, with a share of 16,78% from the total exports.

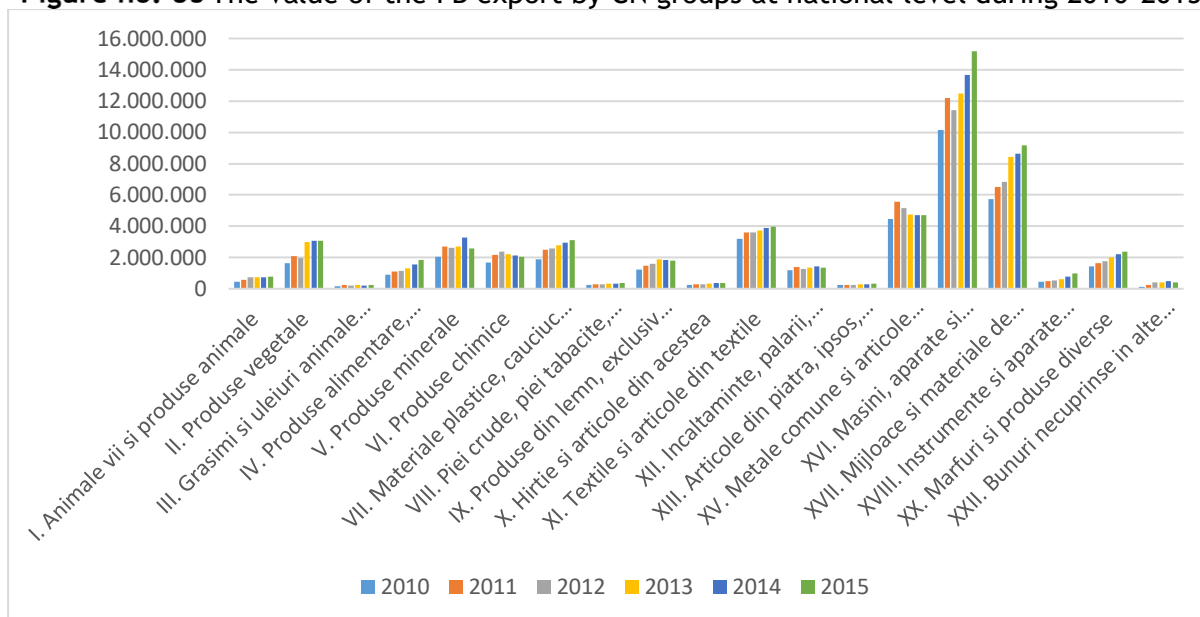
Figure no. 84 The share of import per sections according to the Combined Nomenclature in 2015 at national level



Source: processed data from the National Institute of Statistics 2017

From the above graph it is noted that Romania, with a proportion of 28,44% of the total imports, imports electric machines, devices and equipment. This group is followed by group XV, namely common metals and articles thereof, with a share of 10,7% from the total. On the opposite side, with less than 1% are the following groups: IX - Wood products, excluding furniture and III - Animal or vegetables fats and oils.

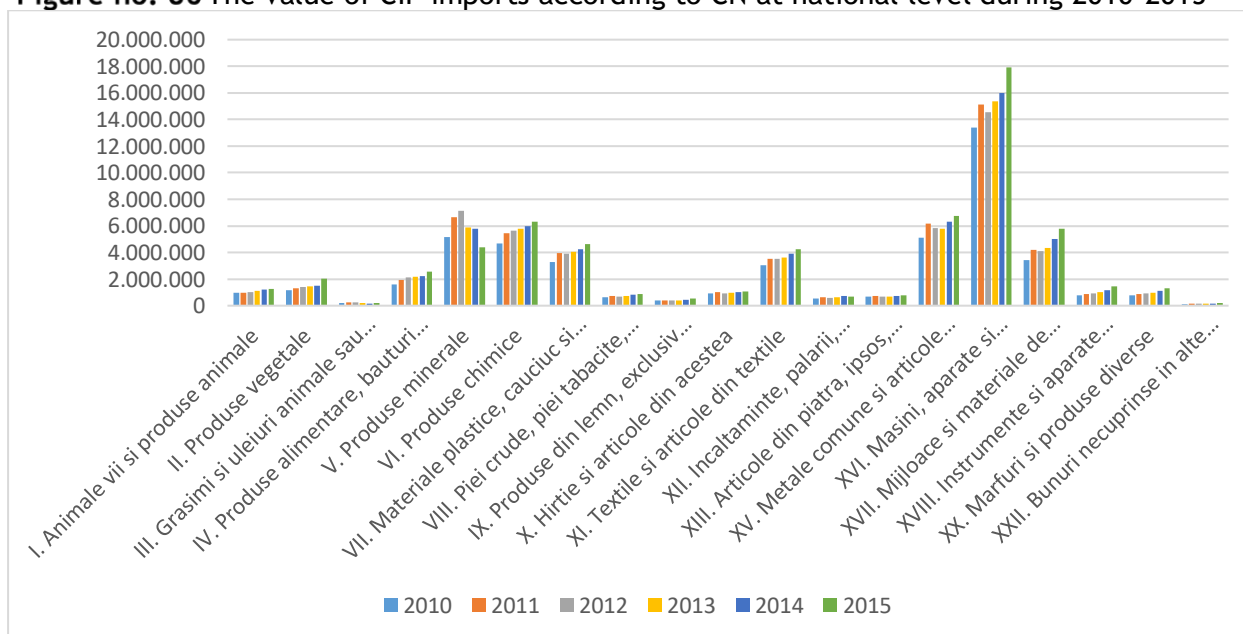
Figure no. 85 The value of the FB export by CN groups at national level during 2010-2015



Source: processed data from the National Institute of Statistics 2017

From the analysis of the graph above, it is noticed that the most exported category is represented by Chapter XVI - Electric machinery, devices and equipment; devices for recording or reproducing sound and images, followed by transport means and materials.

Figure no. 86 The value of CIF imports according to CN at national level during 2010-2015



Source: processed data from the National Institute of Statistics 2017

From the analysis of the above graph, it can be notices that the most important category is represented by Chapter XVI - Electrical machinery, devices and equipment; devices for

recording or reproducing sound and images, followed by common metals and articles thereof.

The trade balance

Definition : The balance of the FOB / FOB trade balance is calculated on the basis of the FOB export value and the FOB import value as the difference between them⁸.

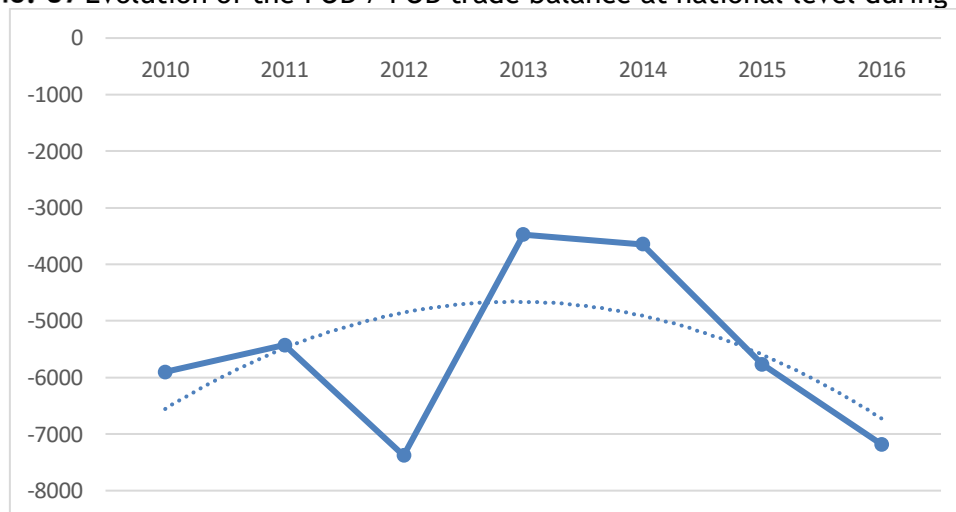
The FOB (Free on Board) price is the price from the frontier of the exporting country, which includes the value of the goods, all transport costs up to the point of embarkation, and all charges incurred for the cargo to be shipped on board.

The balance of the FOB / CIF trade balance is calculated on the basis of the FOB export value and CIF import value, as the difference between them.

The CIF (Cost, Insurance, Freight) price is the price from the frontier of the importing country, which includes both the components of the FOB price and the costs of international insurance and transportation.

The evolution of the indicator can be seen in the graph below.

Figure no. 87 Evolution of the FOB / FOB trade balance at national level during 2010-2016



Source: processes data from the National Institute of Statistics 2017

From the above chart, it can be noticed that Romania's trade balance is negative, the lowest balance being registered in 2012, followed by a slight recovery in 2013 and 2014, while again in the past two years the value decreased close to the level reached in 2012.

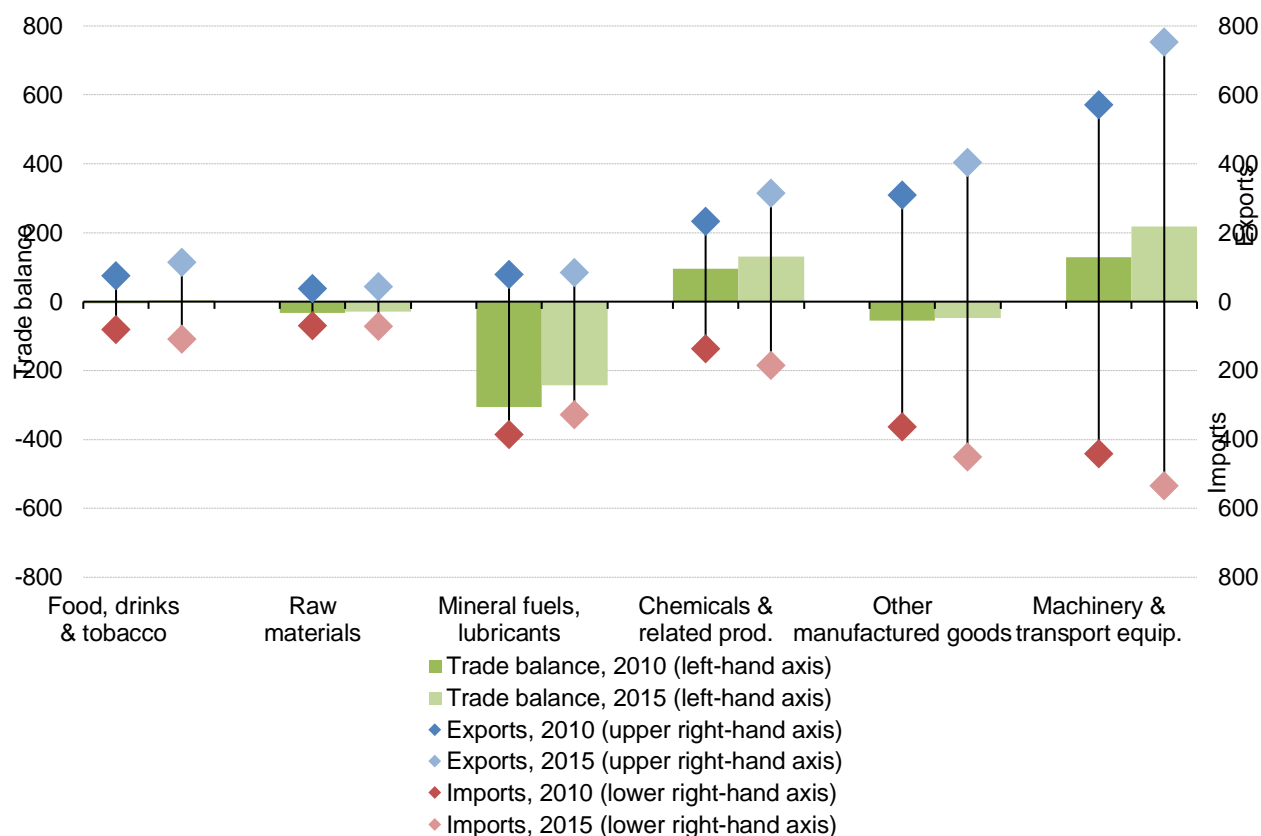
The purchase of goods whose suppliers are located in third countries other than EU Member States is called import or extra-community acquisition.

⁸ http://www.insse.ro/cms/files/statistici/comunicate/comert_ext/a16/Precizari_metodologice.pdf

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The purchase / acquisition of goods whose suppliers are located in EU Member States is called intra-Community acquisition. Exports, imports and trade balance for Extra EU-28 by product category is presented in the chart below.

Figure no. 88 Exports, imports and trade balance for Extra EU-28 by product category, 2010 and 2015

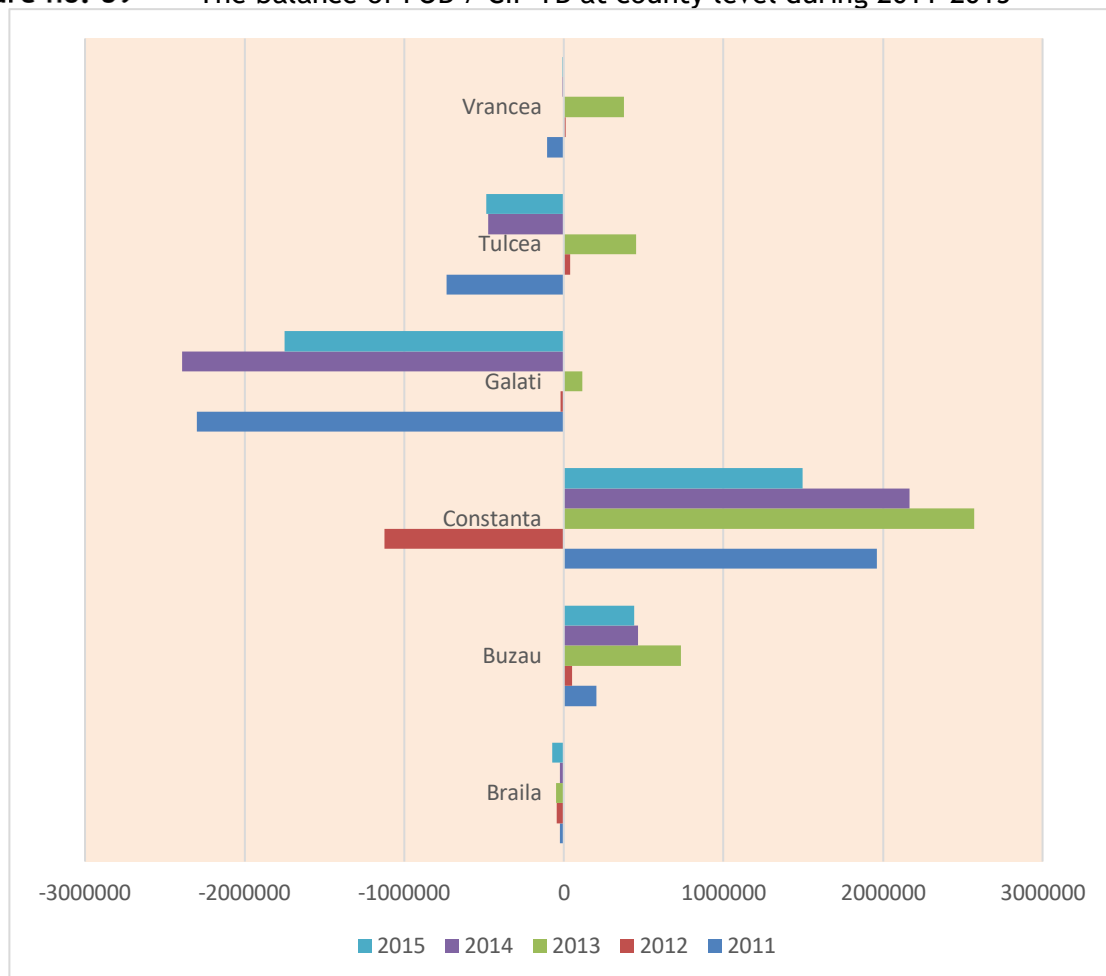


Source: [http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Extra_EU-28_trade_by_main_products,_EU-28,_2010_and_2015_\(billion_EUR\)_YB16.png](http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Extra_EU-28_trade_by_main_products,_EU-28,_2010_and_2015_(billion_EUR)_YB16.png)

In what concerns to extra-EU trade of goods (Extra-EU28) during 2010-2015 period, the lowest import values are recorded for raw materials, followed by food, beverages and tobacco. At the opposite sides, the highest import and export values are for transport machinery and equipment.

At the level of the counties of the South-East Region, there were considered the monthly data from Tempo Online database of the National Institute of Statistics, the first available year being 2011.

Figure no. 89 The balance of FOB / CIF TB at county level during 2011-2015



Source: processed data from the National Institute of Statistics 2017

From the analysis of the above graph it results that:

- Braila has a poor trade balance for all the analyzed years;
- Buzau is in a diametrically opposite situation, its trade balance being surplus;
- Constanta county records a poor trade balance only in 2012;
- Galati and Tulcea have a positive trade balance only in 2013;
- Vrancea has only one year with a positive balance, namely 2013.

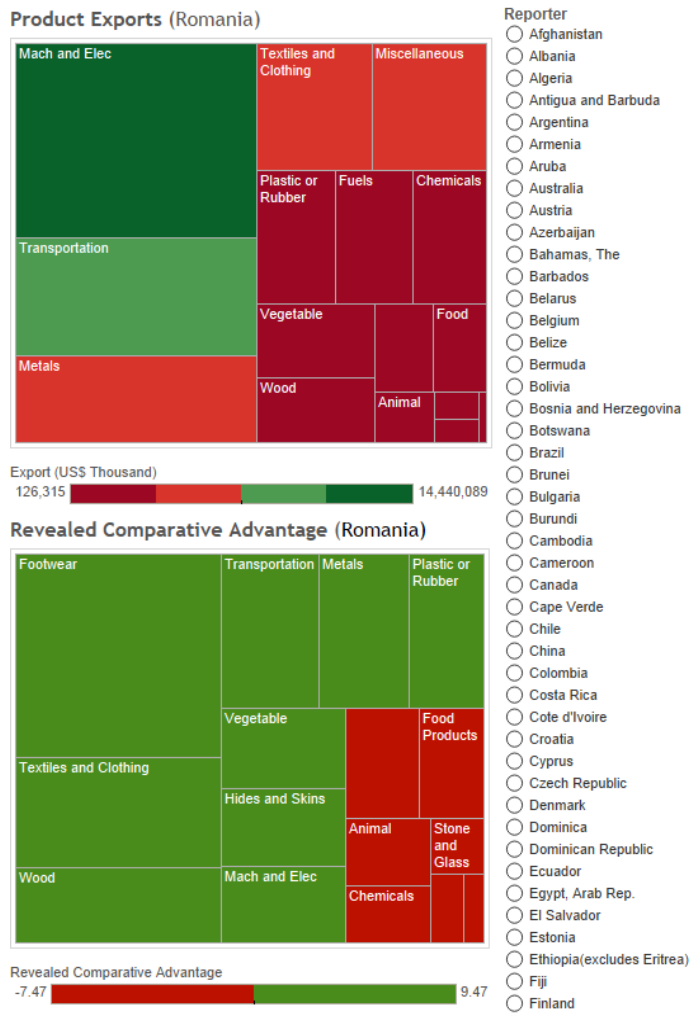
RCA = revealed comparative advantage

The analysis of the international trade performance of the Europe regions is considered one of the most useful tools in designing appropriate regional policies. In this respect, the RXA (Revealed Export Advantage) indicator is extremely relevant, suggesting the extent to which a country or region focuses more or less on exporting certain categories of products than other countries or regions.

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According to the World Bank data, Romania has a world-wide comparative advantages for the following product categories: footwear, textiles and clothing, wood, transport systems, metals, plastics, vegetable products, leather products, transport machinery and equipment.

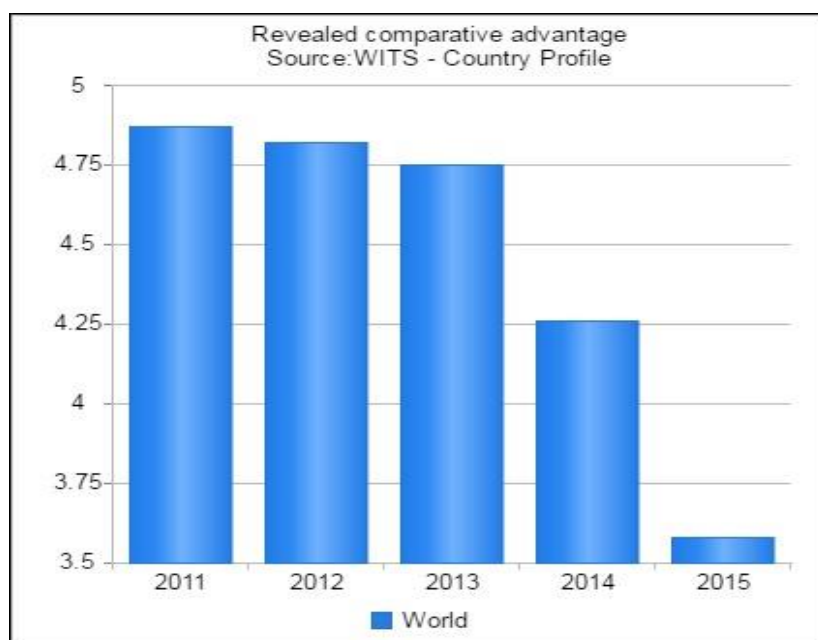
Figure no. 90 Revealed Comparative Advantage (RCA) in Romania (The World Bank, 2014)



The data provided by WITS - World Integrated Trade Solution shows the RCA evolution in Romania for all product categories for which the country has competitive advantages or disadvantages. Thus, as it can be seen from the following figures, during the period 2011-2015, the comparative advantage of Romania on various product categories fluctuated considerably. For example, in 2015 Romania's comparative advantage for the animal product category grew considerably compared to 2014, but remained very low worldwide (0,7). Romania's biggest comparative advantage in the world is related to the category of

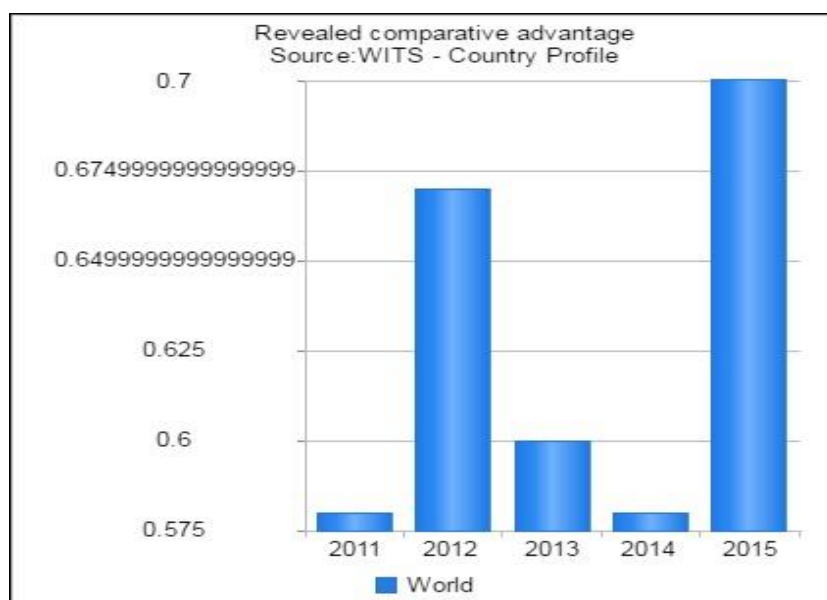
footwear products. Thus, it can be seen that the comparative advantage index for footwear, although decreasing, is 3,58 in 2015.

Figure no. 91 Romania's comparative advantage for animal products (2011-2015)



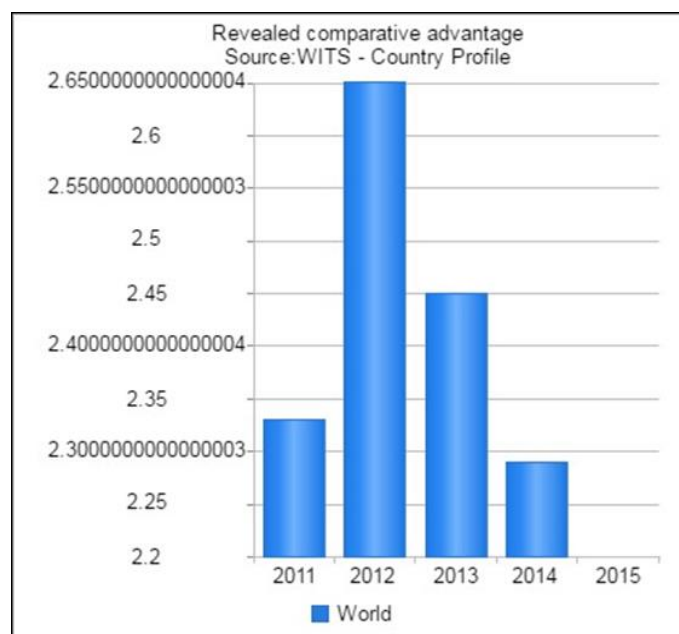
Source: WITS - Country profile, 2017

Figure no. 92 Romania's comparative advantage for textiles (2011-2015)



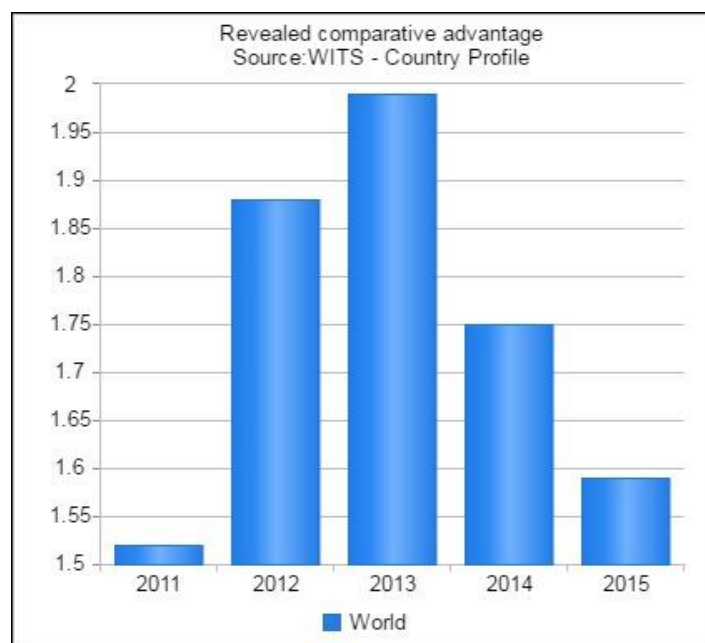
Source: WITS - Country profile, 2017

Figure no. 93 Romania's comparative advantage for textiles (2011-2015)



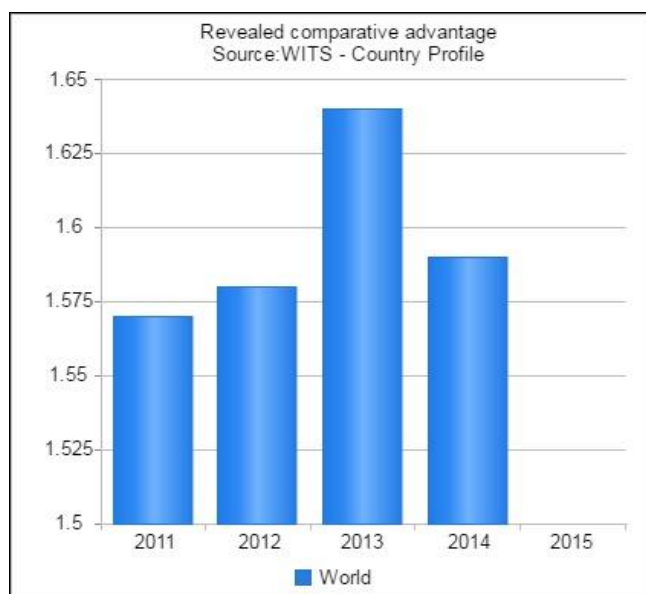
Source: WITS - Country profile, 2017

Figure no. 94 Romania's comparative advantage for transport products (2011-2015)



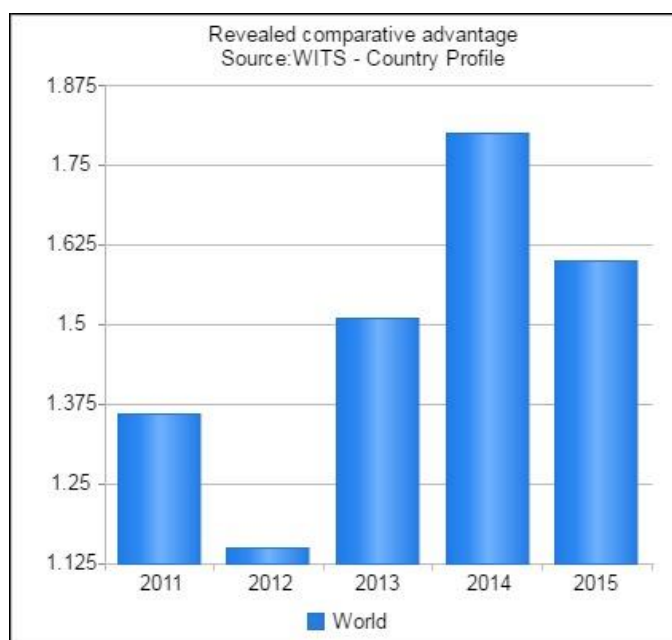
Source: WITS - Country profile, 2017

Figure no. 95 Romania's Comparative Advantage for Wood Products (2011 - 2015)



Source: WITS - Country profile, 2017

Figure no. 96 Romania's comparative advantage for vegetable products (2011-2015)



Source: WITS - Country profile, 2017

In what concerns the South-East Region, the comparative advantage of the region was analyzed using the Revealed Export Advantage (RXA) index. Following the export volume

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analysis (FOB) at regional and national level by counties and sections of the Combined Nomenclature (CN) for January - December 2016, the following conclusions were drawn:

- In 2016, the South-East Region has registered comparative advantages over the following product groups according to the Combined Nomenclature (CN): 01. Live animals; 02. Meat and edible offal; 03. Fish and crustaceans; 08. Edible fruit; 10. Cereals; 11. Products of the milling industry; 12. Seeds and oleaginous fruits; industrial or medicinal plants; 14. Materials for stitching; 15. Animal or vegetable fats and oils; 18. Cocoa and cocoa products; 23. Residues of the food industry; 25. Salt; sulfur, stones; plaster, lime and cement; 27. Fuel and mineral oils; bituminous materials; 28. Anorganic chemicals; 37. Photographic or cinematographic goods; 39. Plastics and articles of plastics; 43. Fur and articles of fur; 51. Wool; 55. Discontinuous synthetic or artificial fibers; 62. Articles of apparel and clothing accessories, other than knitted or crocheted; 70. Glass and glassware; 72. Cast iron, iron and steel; 79. Zinc and articles thereof; 83. Miscellaneous articles of base metal; 89. Ships, boats and floating structures.
- It is important to note that in the **South-East Region**, the RXA indicator was > 1 only for the following product categories:
 - o 01. Live animals;
 - o 14. Materials for stitching;
 - o 15. Animal or vegetable fats and oils;
 - o 23. Residues of the food industry;
 - o 55. Discontinuous synthetic or artificial fibers;
 - o 27. Mineral fuels and oils; bituminous materials;
 - o 89. Ships, boats and floating structures;
 - o 37. Photographic or cinematographic goods;
 - o 72. Cast iron, iron and steel;
- In **Braila** county, according to the RXA indicator, there are no products with comparative advantages. This is questionable and further analyzes are recommended as not all the data regarding that exports of different product categories are available in the INS Tempo Online database.
- In **Buzau** county, it is noted that from the perspective of the comparative advantage index RXA, there are comparative advantages for the following products: 02. Meat and edible offal; 08. Edible fruit; 15. Animal or vegetable fats and oils; 23. Residues of the food industry; 51. Wool; 55. Discontinuous synthetic or artificial fibers; 70. Glass and glassware; 83. Miscellaneous articles of base metal;

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- In **Constanta** county, there are comparative advantages for the following products: 01. Live animals; 10. Cereals; 11. Products of the milling industry; 12. Seeds and oleaginous fruits; industrial or medicinal plants; 18. Cocoa and cocoa products; 25. Salt; sulfur, stones; plaster, lime and cement; 27. Fuel and mineral oils; bituminous materials; 39. Plastics and articles of plastics; 89. Ships, boats and floating structures.
- In **Galati** county, there were recorded comparative advantages for the following products: 15. Animal or vegetable fats and oils; 37. Photographic or cinematographic goods; 72. Cast iron, iron and steel; 79. Zinc and articles thereof; 89. Ships, boats and floating structures.
- In **Tulcea** county, there were registered comparative advantages for the following products: 03. Fish and crustaceans; 14. Weaving materials; 28. Anorganic chemicals; 89. Ships, boats and floating structures;
- At the level of **Vrancea** county, the main comparative advantages can be observed for the products: 43. Fur skins and fur articles; 62. Articles of apparel and clothing accessories, other than knitted or crocheted.

f) The regional analysis of the Research-Development domain

The research, development and innovation activity in Romania is supported by the National Strategy for Research, Development and Innovation 2014-2020, hereinafter referred to as the RDI Strategy 2014-2020 (NSRDI 2020). The strategy is implemented through a series of instruments, mainly through the National Plan for Research, Technological Development and Innovation 2014-2020 (NPRDI 3).

Taking into consideration that in Romania the number of researchers is still very low compared to other EU countries, especially in the business sector as the private sector's access to public research infrastructures is difficult, that the funding of R&D is still very low, Romania spending 20 times less than the European average, it is necessary to pay more attention to the R&D activity at national and regional level. For this purpose, smart regional specialization strategies meet these national needs and have to support the existing research and development poles.

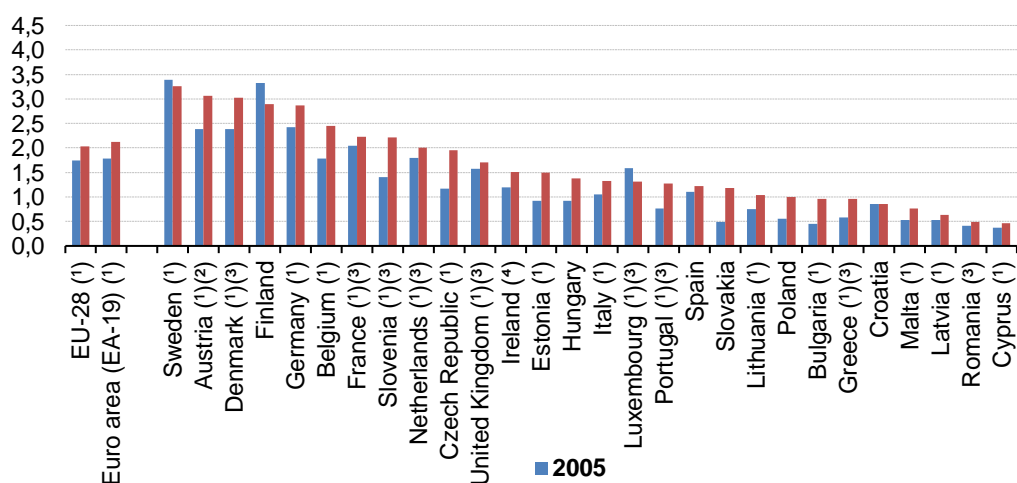
The RDI Strategy 2014-2020 (NSRDI 2020) specifically aims to support smart specialization by concentrating resources in areas of research and innovation of economic relevance and with demonstrated RD potential, through public-public partnerships leading to concentration, efficiency and effectiveness, and public-private partnerships aiming to unlock the identified potential.

At the level of the South-East Region, the potential for the economic development based on R&D activity was identified by analyzing the size and dynamics of R&D spending, the situation of the enterprises developing R&D activities in the region and the existing human resources in the region involved in research activities.

Expenditure for research and development activity

At national level, during the period 2010-2015, the total R&D expenditures increased from 2,413,467 thousand Ron in 2010 to 3,476,933 thousand Ron in 2015. Although the growth is significant, the volume of expenditures for the research activities is still very low compared to other EU countries. It can be seen in the graphic below that at the EU level, only Cyprus (0.46% of GDP) allocates to research activities a lower percentage of GDP than Romania which, in 2015, only allocated 0.49% of GDP. Between 2005 and 2015, Romania's advance was just 0.08% of GDP, much below the efforts of countries such as Slovenia (+ 0.80% of GDP), the Czech Republic (+ 0.78% of GDP), Slovakia + 0.69% of GDP), Bulgaria (+ 0.51% of GDP) or Hungary (+ 0.46% of GDP). In the European Union, the countries focusing the most attention on R&D are Sweden (3.26% GDP), Austria (3.07% GDP), Denmark (3.03% GDP), Finland (2.90% GDP) and Germany (2.87% GDP). According to the National Strategy for Research, Development and Innovation 2014-2020, the R&D expenditures in Romania should reach 1% of GDP in 2020, both in the public sector and in the business sector. In what concerns the allocation of R&D expenditure as a percentage of GDP per sector, in 2015, the business sector spent 0.21% of GDP, the government sector 0.19% of GDP, the higher education 0.09% of GDP, while the nonprofit private sector 0% of GDP (EUROSTAT, 2017).

Figure no. 97 Expenditures with research and development activity at EU level, % GDP (2005, 2015)



Source: processed data from Eurostat, 2017

(¹) 2015: estimated or provisional.

(²) 2005: estimated.

(³) Interruptions in data.

(⁴) 2014 instead of 2015. 2014: estimation.

(⁵) 2005: the definition is different. 2014 instead of 2015.

(⁶) 2014 instead of 2015.

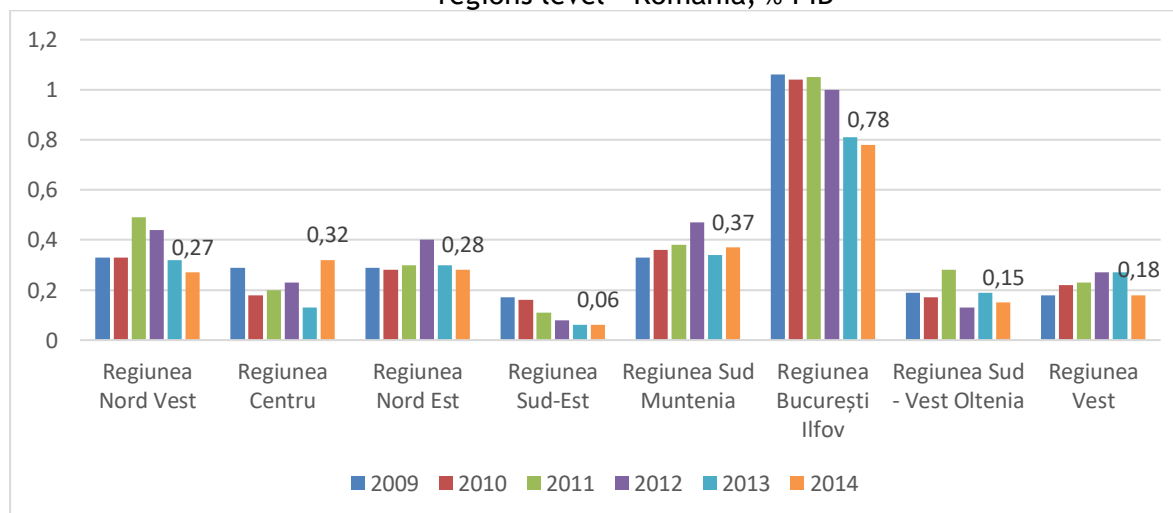
(⁷) 2012 instead pf 2015.

(⁸) 2005: not available.

(⁹) The definition is different. 2013 instead of 2015. 2013: estimation.

At the level of Romania's development regions, the Bucharest-Ilfov Region registered the highest percentage of R&D expenditure in the 2009-2014 period, followed by the South-Muntenia Region and the North-West Region. The South-East Region has the lowest percentage of R&D expenditure in Romania in 2014, with only 0.06%, and at the European level only the Ceuta Autonomous Region of Ceuta (ES) (0.06%) declaring a similar low percentage.

Figure no. 98 Expenditures with research and development activity at the development regions level - România, % PIB



Source: processed data from Eurostat, 2017

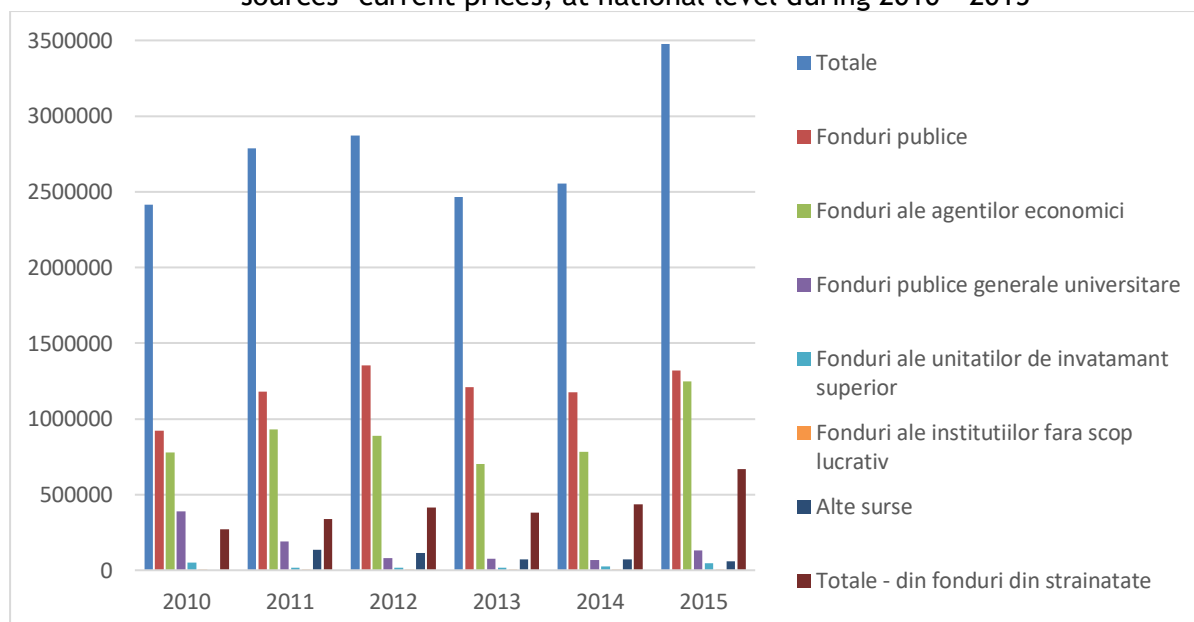
During 2010-2015 period, from the analysis of the total expenditures of the R&D activity per financing sources - current prices, it can be noticed that the source of financing of

public funds registered a slightly upward trend, reaching in the year 2015 a value of 1,318,547 thousand Ron.

Also, a significant increase in expenditures was registered at the level of the economic agents, which, if in 2014 only allocated 782,118 thousand Ron, in 2015 increased the expenditures allocated to RD to 1,248,882 thousand Ron. At the same time, there is a significant increase in R&D expenditures from funds from abroad, which tripled in 2015 compared to 2010.

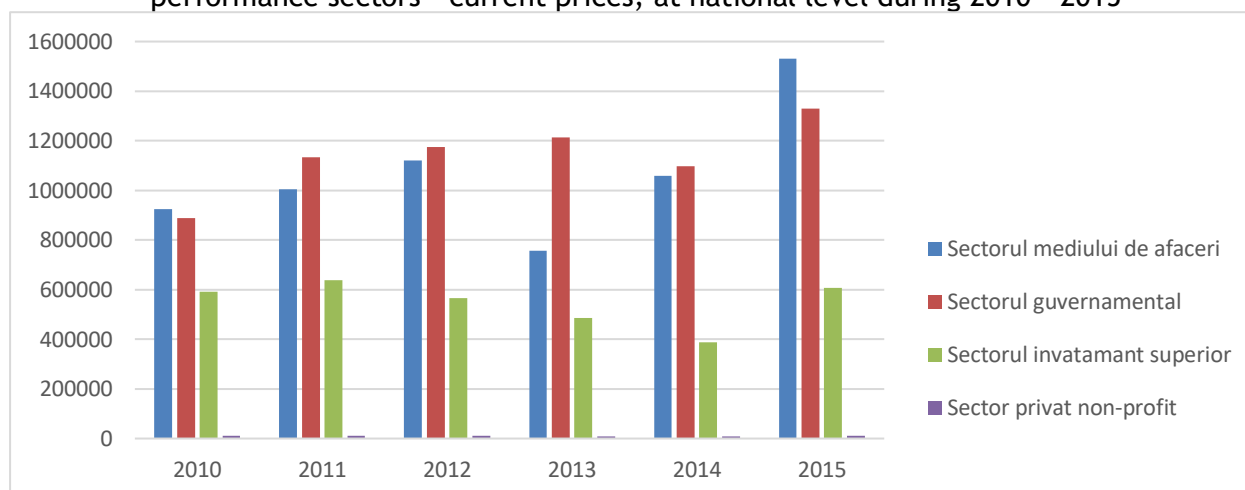
In what concerns the total expenditures from research and development activity per performance sectors, there is a positive trend in both business and government expenditures, while the private non-profit sector is not experiencing significant changes.

Figure no. 99 Total expenditures from research and development activity, per financing sources- current prices, at national level during 2010 - 2015



Source: processed data from the National Institute of Statistics, 2017

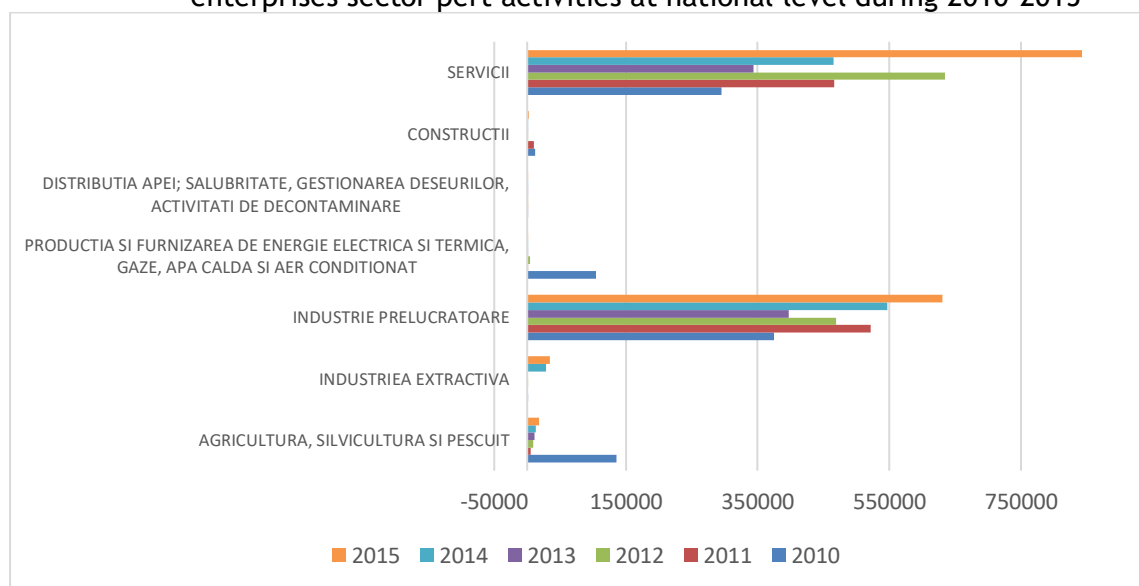
Figure no. 100 Total expenditures from research and development activity per performance sectors - current prices, at national level during 2010 - 2015



Source: processed data from the National Institute of Statistics, 2017

The total expenditures from the R&D activity in the enterprises sector, per NACE activities in Romania are shown in the graphic below. It is noticed that in 2015, the highest expenditures were in services, manufacturing and extractive industries.

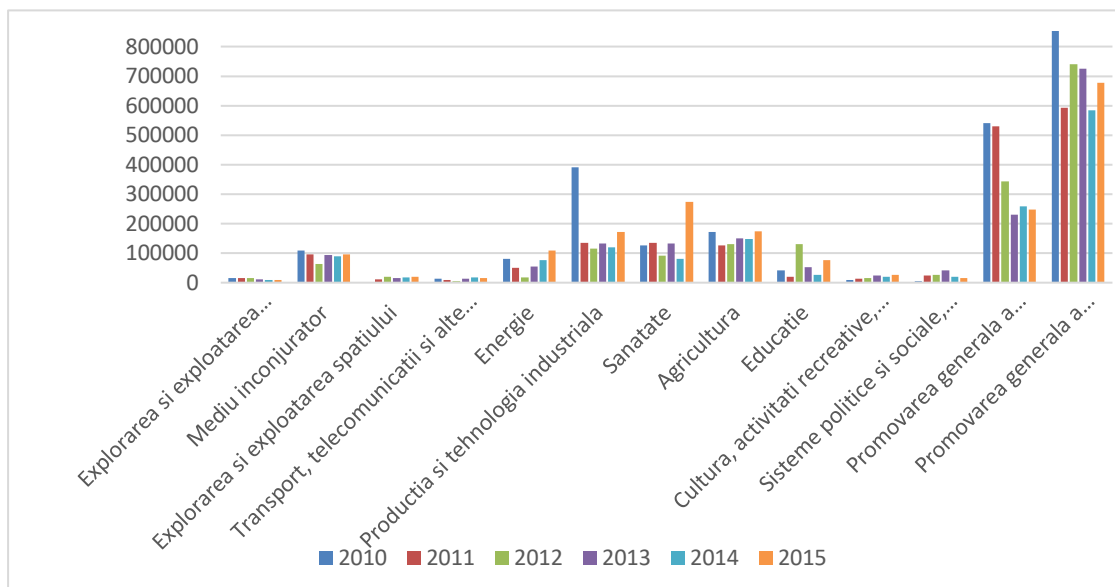
Figure no. 101 Total expenditures from the research and development activity from enterprises sector per activities at national level during 2010-2015



Source: processed data from the National Institute of Statistics, 2017

At national level, at the level of the total expenditures from research and development activity per types of research and development programs, according to NABS 2007, the general knowledge promotion activities are predominant, as well as the industrial production and technology, health and agriculture.

Figure no. 102 Total expenditures from the research and development activity per types of research and development programs, according to NABS 2007 - current prices at national level during 2010-2015

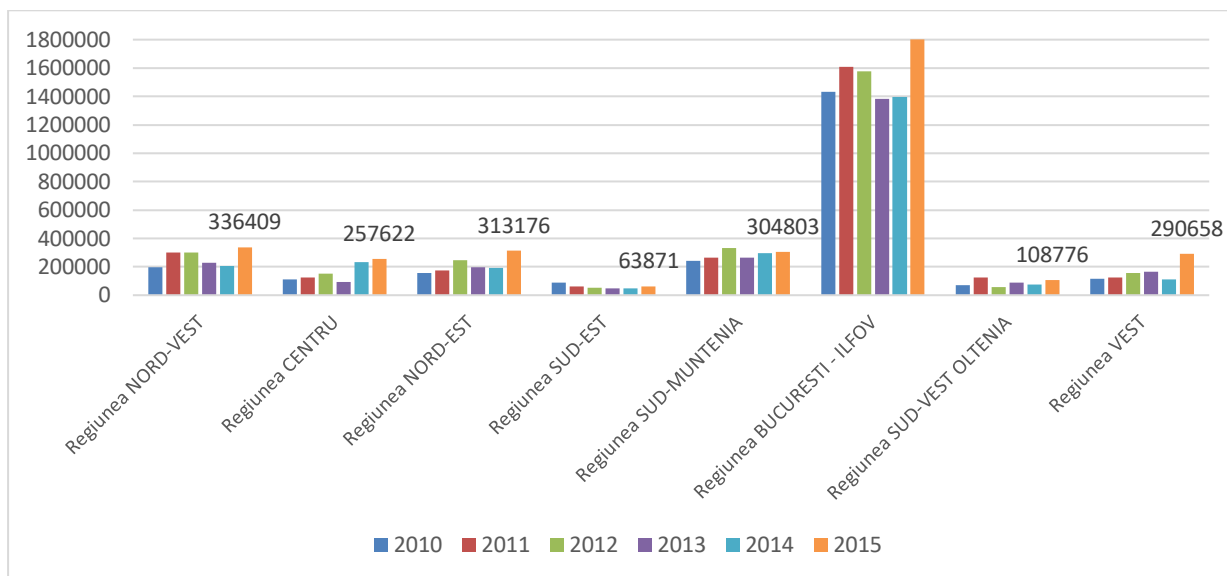


Source: processed data from the National Institute of Statistics, 2017

The total expenditures from research and development activities per development regions experienced a slightly upward trend during the 2010-2015 period, with the exception of the South-East Region; the only region that has registered significant growth is Bucharest-Ilfov. It can be seen from the graphic below that in the South-East Region, between 2010 and 2015, the research and development expenditures decreased from 89,095 thousand Ron in 2010 to only 63,871 thousand Ron in 2015. Moreover, as it can be seen from the graphic, the South-East Region is the region with the lowest research and development expenditures in Romania. Among the main explanations of this situation, which can be identified without a detailed analysis of the causal factors, are: the reduced number of institutions whose main object is research and development, the small number of researchers and personnel involved in research activities, the low number of competitions to obtain funding for research activities, the low interest of business companies in the region for research and development activities.

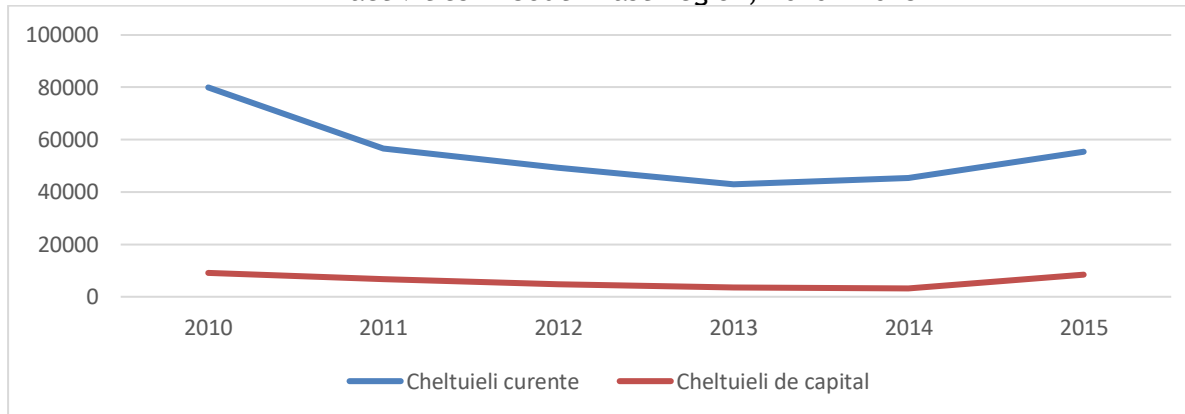
In what concerns the breakdown of the expenditures per current and capital expenditures, between 2010 and 2014, both expenditure categories experienced a downward trend and, as seen in the following graphic, the current expenditure is predominant.

Figure no. 103 Total expenditures from research and development activities, per development regions - current prices, 2010 - 2015



Source: processed data from the National Institute of Statistics, 2017

Figure no. 104 Current and capital expenditures from the research and development activities in South-East Region, 2010 - 2015

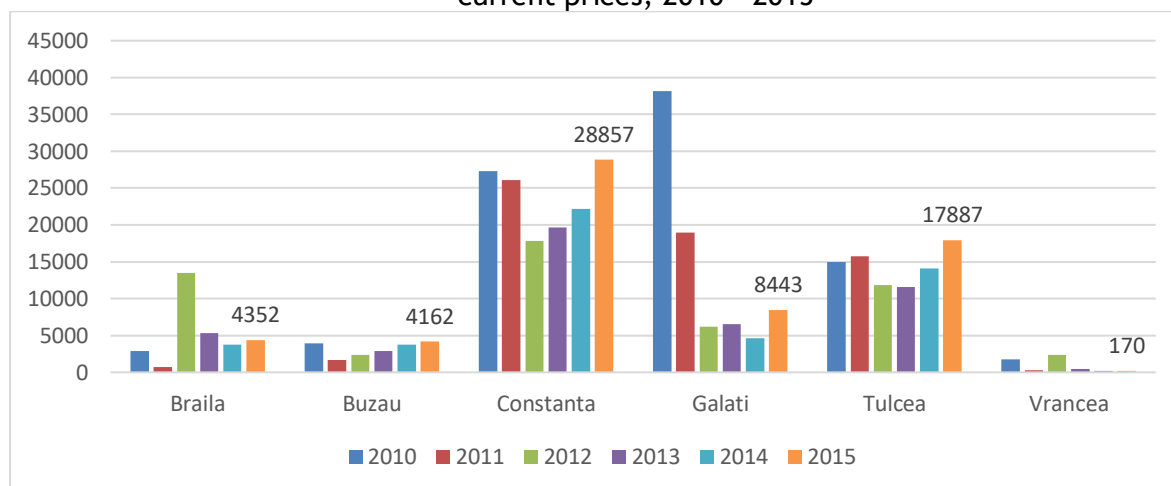


Source: processed data from the National Institute of Statistics, 2017

From the analysis of the volume of total expenditures from the research and development activity on the counties of the South-East Region, it can be noticed that the counties with a larger volume of RD expenditures are Constanta, Galati and Tulcea. Vrancea is the county with the lowest expenditures on research and development activity. In Galati county, compared to 2010, the expenditures on RD activity decreased dramatically, from 38,196 thousand Ron in 2010 to 8,443 thousand Ron in 2015. Among the possible causes are the reduction of the access to the European funds during the period after 2013, but also a decrease in R&D expenditures in the big companies at county level due to the

economic crisis and business difficulties. The only counties in the region that are on an upward trend for this indicator are Constanta and Tulcea. In these two counties there are a significant number of clusters, universities, institutes and research stations that have found ways to attract funds for research and development activities.

Figure no. 105 Total expenditures from research and development activity, per counties - current prices, 2010 - 2015



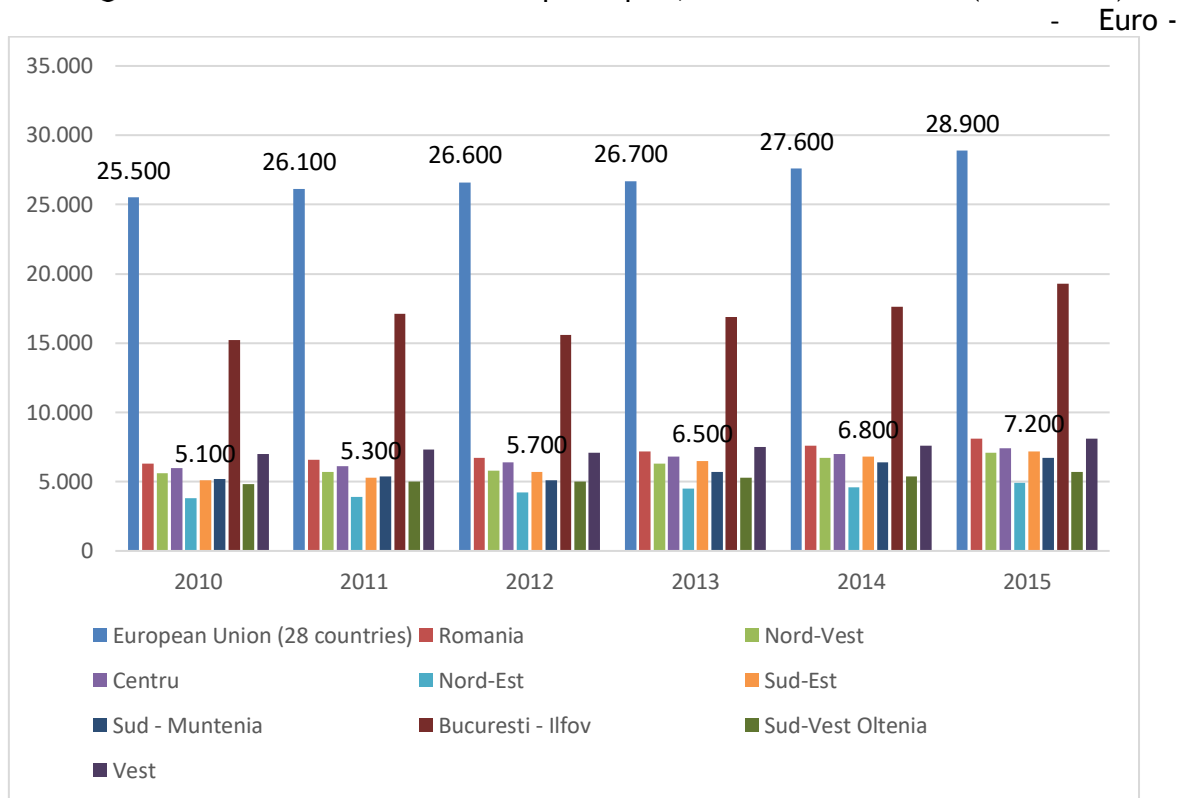
Source: processed data from the National Institute of Statistics, 2017

In conclusion, it can be said that in terms of expenditures on research and development, Romania still allocates a very low budget to this activity compared to other countries in the European Union, which has direct consequences on the quality of scientific research in the country, on the quality of human research resources and the results of R&D and innovation activity. The South-East region allocates only 0.06% of GDP to research and development being, at the level of 2014 for which Eurostat data are available, the lowest percentage in the European Union.

The relationship between GDP / capita and expenditures with research and development activity

- The Gross Domestic Product (GDP) is a key indicator of development and growth. The GDP and household incomes are first calculated in national currency, then converted to purchasing power parity (PPP), which takes into account price differences between Member States, which allows a more accurate comparison. Using PPP (instead of market exchange rates) allows these indicators to be converted into a common virtual currency called Purchasing Power Standard (PPS). The use of the PPS makes it possible to compare purchasing power in all regions of the Member States that use different currencies and where the price level is different.

Figure no. 106 Evolution of GDP per capita, Romania and the EU (2010-2015)



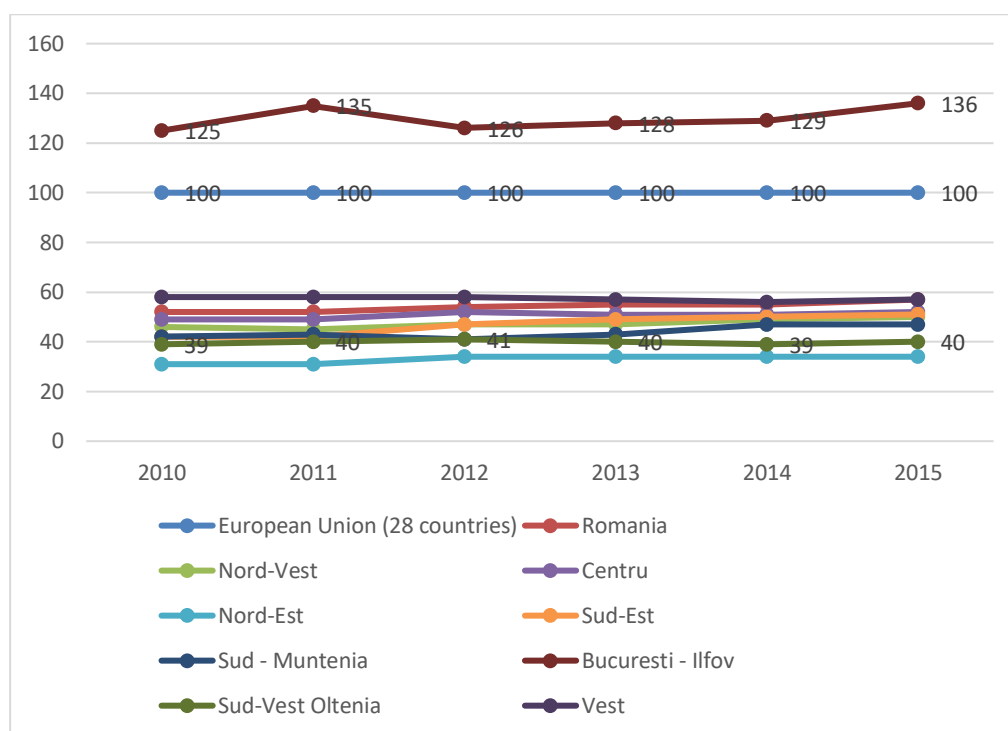
Source: processed data from Eurostat 2017

As it can be seen from the graphic above, the trend of the indicator in the South-East Region is increasing, but below the national and the European Union average. The GDP per capita increased from € 5,100 per capita in 2010 to € 7,200 per capita in 2015. If in 2010 the GDP per capita of the South-East Region was almost five times lower than the European average, in 2015 it is only four times lower than the EU average.

The indicator expressed in PPS is even more suggestive. At the level of 2011, GDP/inhabitant PPS was 42% of the European average, reaching 51% in 2015. The Bucharest-Ilfov region, which is above the European average, is important to be mentioned.

This situation can be seen in the chart below.

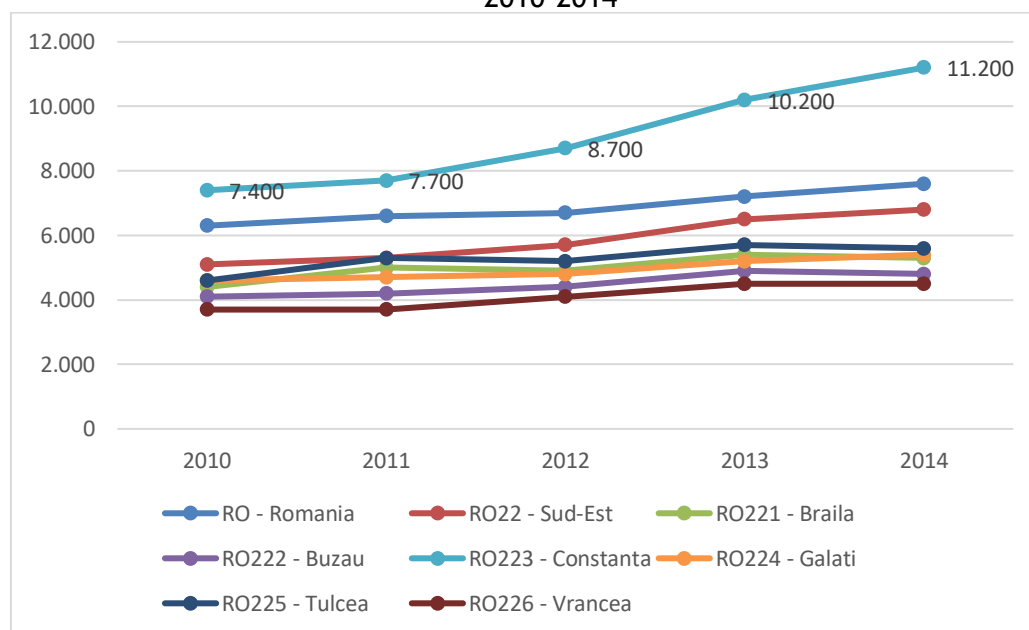
Figure no. 107 The Purchasing Power Standard (PPS) of the GDP/capita expressed in percentage from the EU level during 2010-2015



Source: processed data from Eurostat 2017

The evolution of the indicator in euro per capita for the 2010-2014 period is presented in the graphic below.

Figure no. 108 The evolution of GDP/capita at national and regional level during 2010-2014



Source: processed data from Eurostat 2017

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From the above graphic, it can be noticed an upward trend of the indicator for each county, but also for the South-East Region. Also, the GDP / capita in Constanta County is higher than the regional average, but also higher than the national average. It increased from € 7,400 per capita in 2010 to € 11,200 per capita in 2014. The last position is occupied by Vrancea, whose GDP per capita has increased from € 3,700 per capita in 2010 to € 4,500 per capita in 2014.

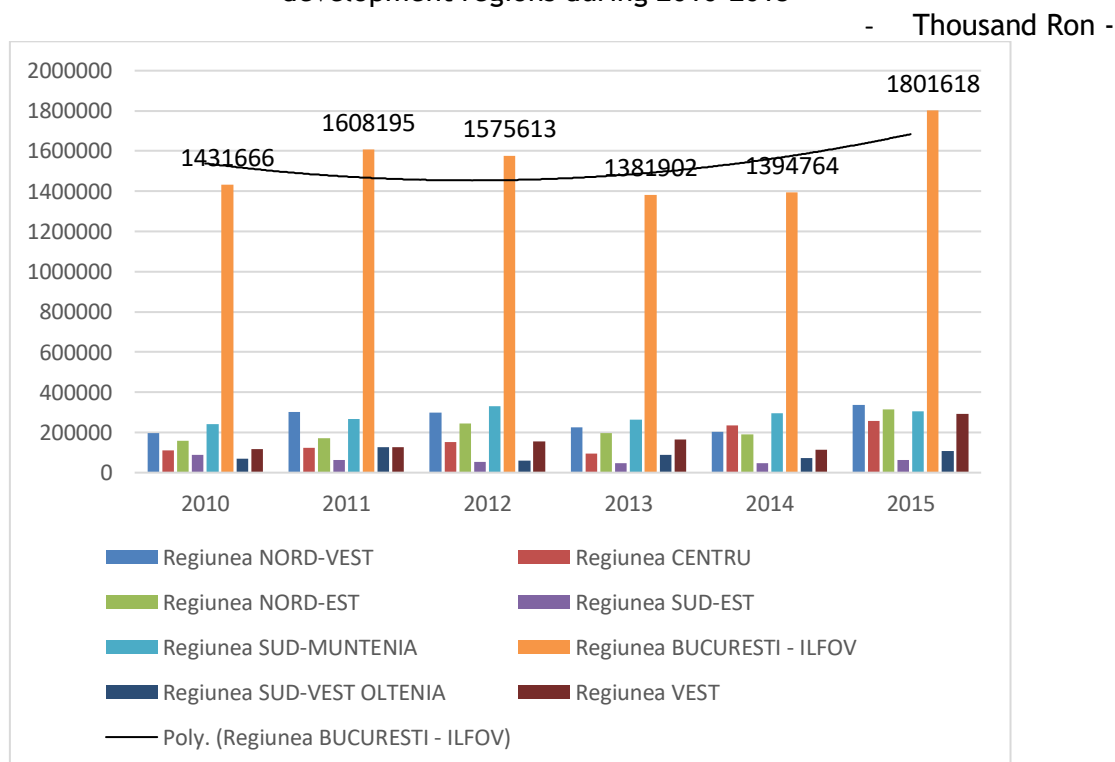
Expenditures with research and development activity

The expenditures incurred in the units with research and development activity refer to the current and capital expenditures in the field of activity of the respective units.

The destination of the expenditures:

- Current payments - the payments made during a certain period within the units, representing the labor cost, materials and other current expenses;
- capital (investments) - the payments made in a certain a period for the construction of buildings, the purchase of equipments, instruments, machinery and equipment or other expenses of this kind intended to contribute to the increase in the volume of fixed assets.

Figure no. 109 The evolution of expenditures with research and development, per development regions during 2010-2015



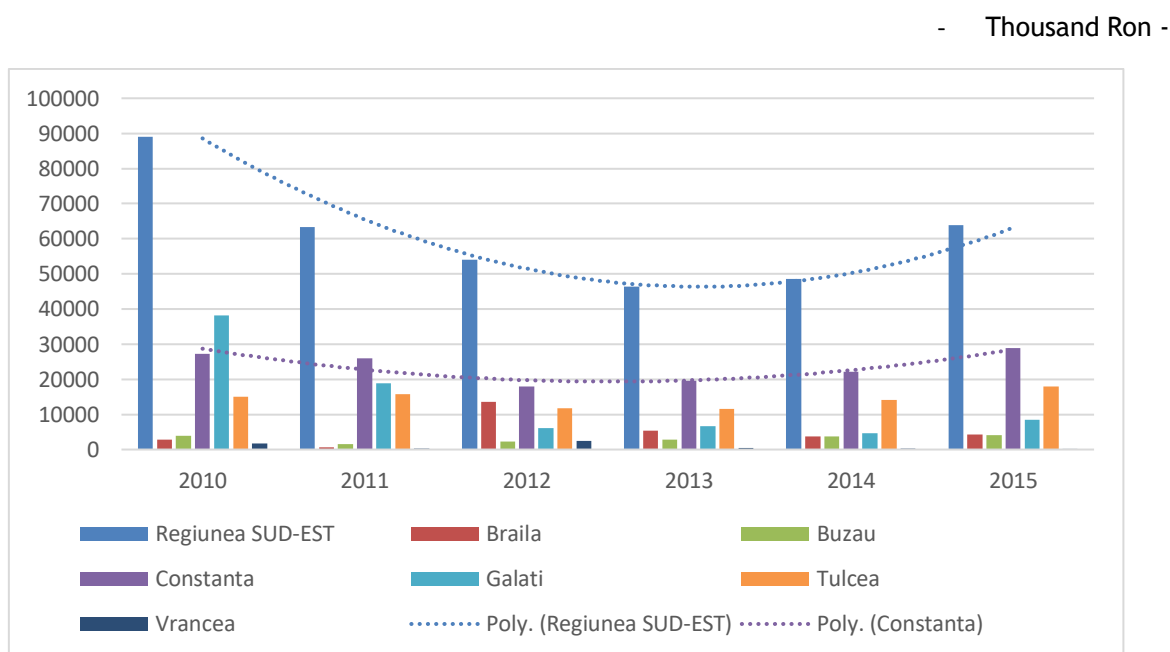
Source: processed data from National Institute of Statistics 2017

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The trend of the indicator is decreasing, from 89,095 thousand Ron in 2010 to 63,871 thousand Ron in 2015, occupying the last places in the regional hierarchy. The top of the ranking is occupied by the Bucharest-Ilfov region.

At regional level, there are large discrepancies between counties. The counties of Braila and Vrancea occupy the last places in the ranking. Constanta county occupies the first position in the ranking, with the exception of 2010, when it is overtaken by the county of Galati.

Figure no. 110 The evolution of expenditures with research and development, at county level during 2010-2015



Source: processed data from National Institute of Statistics 2017

From the above graph it is observed that the trend of the last years is parabolic, with a minimum value in 2013, the situation increasing in 2014 and 2015. The same trend is also found in Constanta county. Galati county had a maximum value in 2010, after which the indicator value dropped significantly. But there is also a reversal of the trend over the past two years.

The relationship between GDP/capita and research and development expenditures for the South-East Region

In order to model the relationship between GDP/capita and the expenditures on research and development, the following econometric model was developed.

$$\text{GDPpercapita} = \beta_0 + \beta_1 \text{Expenditure with research and developmentpercapita} + \varepsilon$$

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The following database was built on the basis of the information collected from Eurostat.

Table no. 7 GDP/capita and expenditures with research and development at national level during 2000-2015

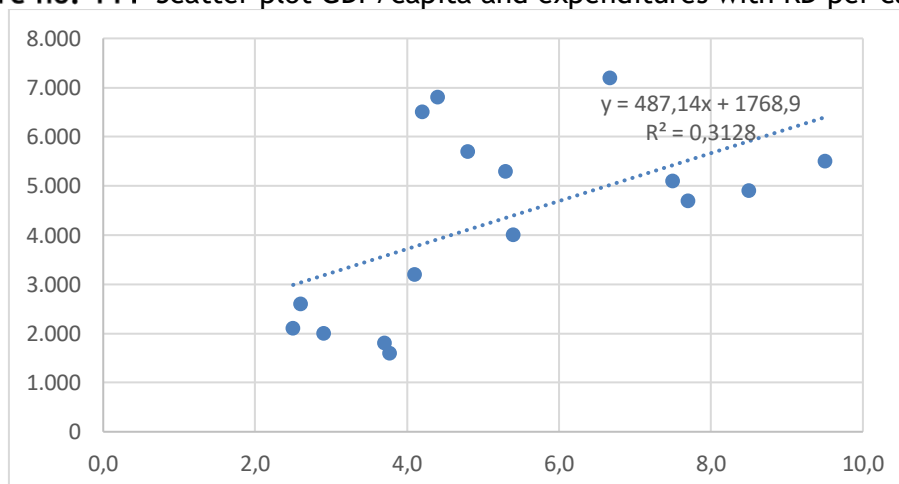
- Euro/capita-

Year	GDP/capita	Expenditures with research and development
2000	1.600	3,8
2001	1.800	3,7
2002	2.000	2,9
2003	2.100	2,5
2004	2.600	2,6
2005	3.200	4,1
2006	4.000	5,4
2007	4.900	8,5
2008	5.500	9,5
2009	4.700	7,7
2010	5.100	7,5
2011	5.300	5,3
2012	5.700	4,8
2013	6.500	4,2
2014	6.800	4,4
2015	7.200	6,7

Source: Eurostat 2017

The linear link between the two indicators can be seen in the scatter plot below:

Figure no. 111 Scatter plot GDP/capita and expenditures with RD per capita



Source: own calculation

A direct and strong linear relationship was observed.

The application of simple linear regression analysis gives the following results:

Figure no. 112 Simple linear regression

SUMMARY OUTPUT						
<i>Regression Statistics</i>						
Multiple R		0,559323137				
R Square		0,312842372				
Adjusted R Square		0,263759684				
Standard Error		1611,624375				
Observations		16				
<i>ANOVA</i>						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	16554836,23	16554836,23	6,373782422	0,024281885	
Residual	14	36362663,77	2597333,127		<5%	
Total	15	52917500				
<i>Coefficients</i>						
	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	
Intercept	1769	1085,071591	1,630253421	0,125332352	-558,3054308	4096,1888
Research and developme	487,1383937	192,9539807	2,524635107	0,024281885	73,29326447	900,98352

Source: own calculation

Thus, the regression model can be written as follows:

$$\text{GDPpercapita} = 1769 + 487.13 * \text{Expenditures with research and developmentpercapita}$$

The free term is not statistically significant. The regression slope coefficient is, however, statistically significant for a confidence level of 95%. This means that an increase in research and development expenditures will cause an average increase in GDP/capita. It can therefore be concluded that the investment in R&D activities is a strong growth factor of the GDP/capita regional economic development indicator.

The determination coefficient of the model is 31.29%, which means that the GDP/capita variation in the region can be explained by the R&D expenditure variation, the rest, up to 100% being attributable to other factors.

The situation of staff in research and development activity

The economic development of Romania and, implicitly, of the country's regions can not be achieved without the R&D activity and implicitly without the labor force specialized in implementing such scientific activities. In addition to the intense need to increase the funding for R&D and innovation, Romania needs to identify ways to retain and attract world-class researchers.

The objective of SO 5 of the National Strategy for Research, Development and Innovation 2014-2020 aims to reach the critical mass of researchers by 2020 in order to transform RDI

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into a factor of economic growth by ensuring rapid and sustainable numerical and qualitative development, of human resources in research, development and innovation. Thus,

"The strategy supports the increase of internal and international mobility of researchers and also the wider openness of the public research environment to researchers from the private and foreign fields, through:

- integration of PhD students and young PhDs into RDI projects;*
- encourage the attraction of advanced foreign researchers to lead projects in a host institution in Romania;*
- the obligation of public research organizations to publish all open positions in Euraxess and to adhere to the Charter and the European Researcher Code * 10);*
- introducing policies on the electronic identity of researchers for access to digital research services;*
- the creation of the Romanian Researchers Register, including those participating in Romanian projects, in order to increase the transparency of the researchers' community and the rapid access to relevant researchers for any type of stakeholder entity - part of a broader assurance of an analytical basis ("Big Data" type) to substantiate public policies and free access to public data."*

At the level of the European Union (28 countries), in 2015 there were 2,848,841 people engaged in research and development activities (full-time equivalent). Out of these, 1,996,726 people were among the first 19 countries that joined the EU. It can be seen in the graphic below that the largest number of people employed in R&D is in Germany, France and the UK, with Malta and Cyprus occupying the last positions, which is also justified by the small size of the population and the territory of these countries. In what concerns the total number of researchers, in 2015 in the EU there were 1,817,701 researchers (full-time equivalent) out of which 1,219,752 researchers in the EU 19.

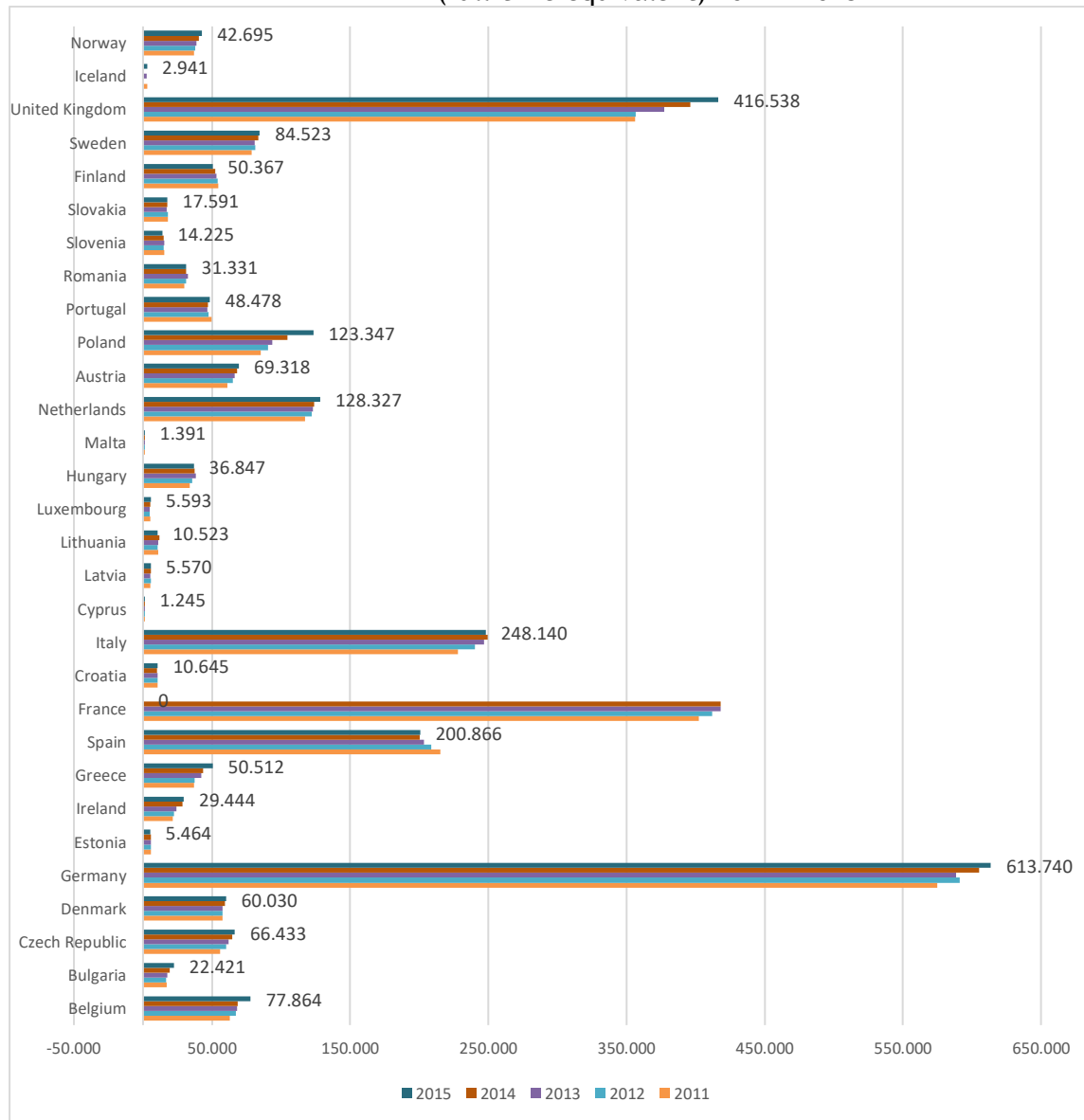
In Romania, the total number of persons engaged in research and development activities was 31.331 persons (full-time equivalent) in 2015. As it can be seen from the data available at Eurostat, most employees are in the government sector (12,080 in 2015), followed by business sector and higher education. Only 115 people worked in R&D activities in the non-profit private sector in 2015. In Romania, the number of researchers (full-time equivalent) was 17,459 in 2015.

In what concerns the R&D employees as a percentage of the total labor force, Romania registered only 0.53% and as a percentage from the active population it was recorded only

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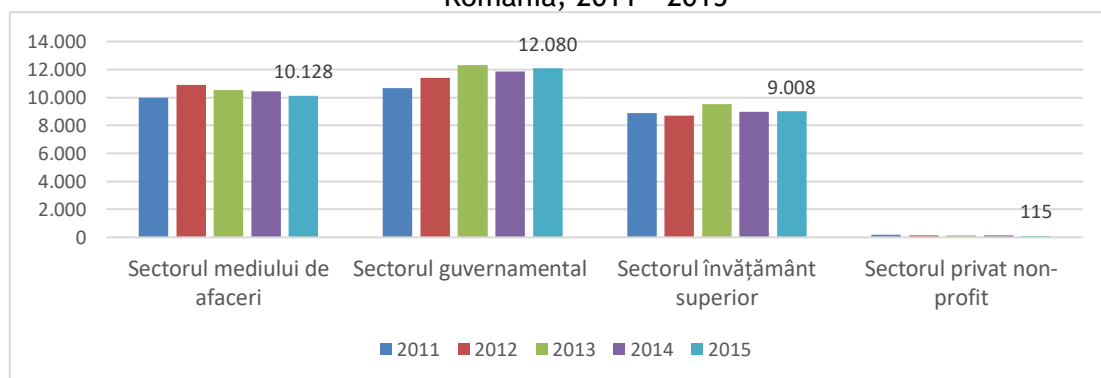
0.49% in 2013 for which data at European level was available. In comparison, across the EU level, the percentage of R&D employees as a percentage of the total labor force was 1.97% and as a percentage of the active population it was registered 1.75%. These differences are significant, considering also that these percentages are the lowest in the European Union.

Figure no. 113 Total staff and researchers employed in R&D in European countries (full-time equivalent) 2011 - 2015



Source: Eurostat 2017

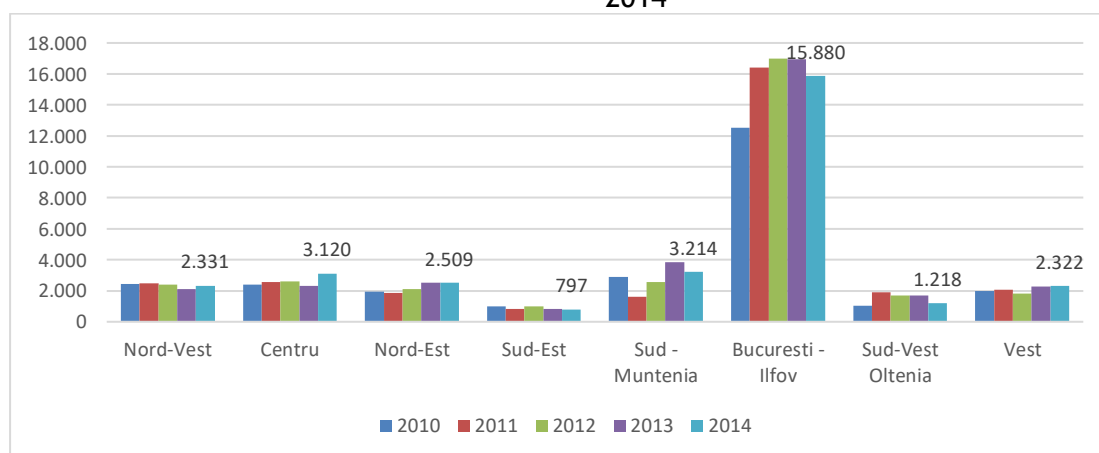
Figure no. 114 Total staff and researchers employed in R&D per activity sectors in Romania, 2011 - 2015



Source: processed data from Eurostat 2017

At regional level, between 2010 and 2014, the number of R&D personnel remained relatively constant, with a slight increase in the North-West, Center and West regions and a more significant reduction in the South-Muntenia, Bucharest-Ilfov and South-West Oltenia. In what concerns the South-East Region, the number of R&D personnel decreased from 996 in 2010 to 797 in 2014.

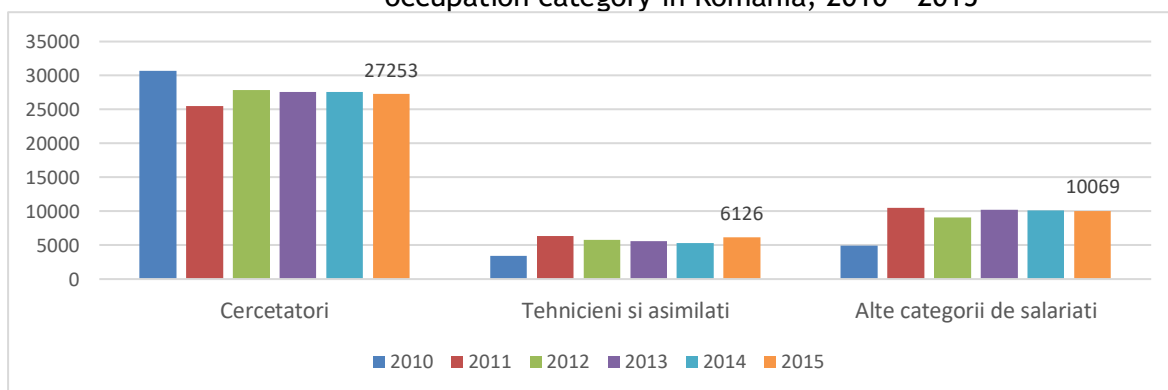
Figure no. 115 Total staff and researchers employed in R&D at regional level, 2010 - 2014



Source: processed data from Eurostat 2017

In what concerns the number of employees in R&D activity from the occupation point of view, it can be noticed that between 2010 and 2015 in Romania the number of researchers is slightly decreasing from 30,707 persons to 27,253 persons, while the number of technicians and other categories of employees remain constant. From the age category point of view, in 2015 only 374 researchers were up to 25 years old, 4,208 researchers were between 25 and 34 years old, 6,934 researchers were between 35 and 44 years old and a number of 10,573 researchers were between 45 to 65 years old and over.

Figure no. 116 The number of employees in the research - development activity per occupation category in Romania, 2010 - 2015

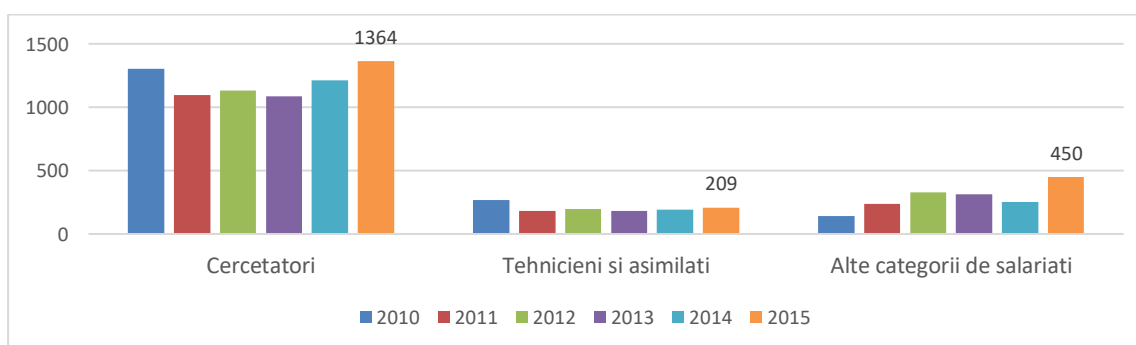


Source: processed data from National Institute of Statistics 2017

At the regional level, the number of researchers in 2010-2015 increased in the North-East Region from 2,966 in 2010 to 3,470 researchers in 2015 and in the South-East Region it increased from 1,302 researchers to 1,364 in 2015. A decrease in the number of researchers between 2010 and 2015 was registered in the North-West, Center, South Muntenia, Bucharest-Ilfov, South-West Oltenia and West regions.

In what concerns the number of R&D technicians and assimilated staff, a slight downward trend is observed in the South-East Region between 2010 and 2014, with a slight increase in 2015 when 209 employees were registered. Interestingly, the number of other R&D employees in the South-East Region tripled between 2010 and 2015, from 142 in 2010 to 450 in 2015.

Figure no. 117 The number of employees in the research - development activity per occupation in the South-East region, 2010 - 2015



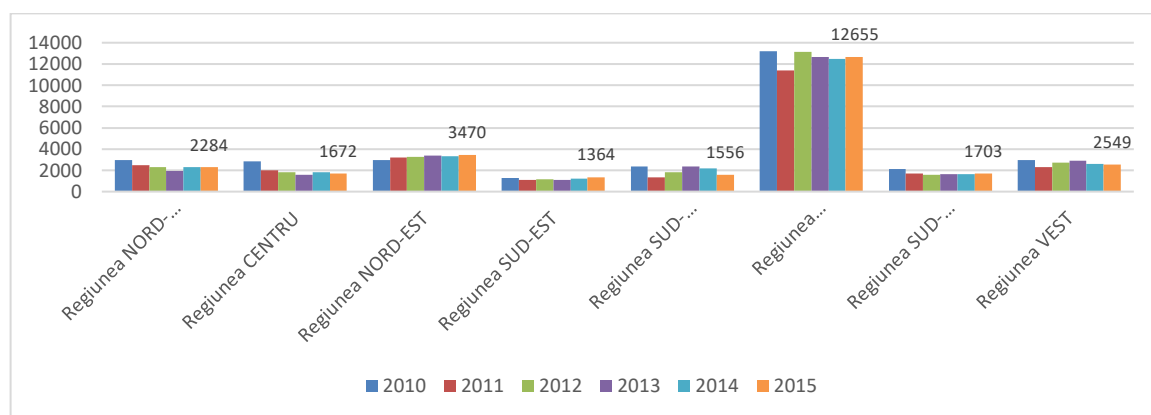
Source: processed data from National Institute of Statistics 2017

Analyzing the situation in the counties of the South-East Region, it is noticed that the largest number of researchers in 2015 was registered in Constanta county (815 persons), followed by Galati county (413 persons) and Tulcea (74 persons). In the counties of Brăila,

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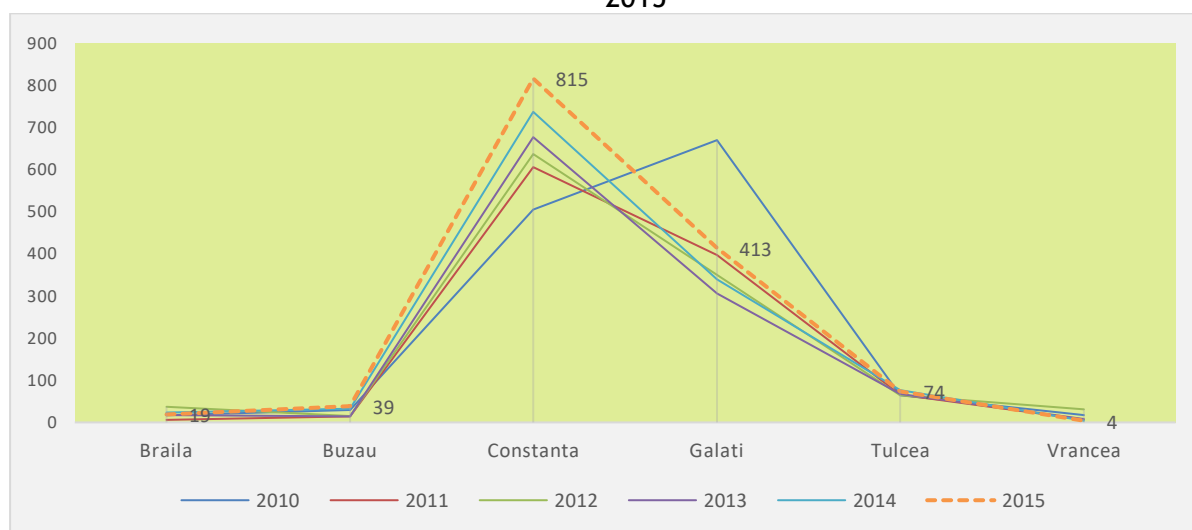
Buzău and Vrancea, the number of researchers is significantly lower and there are no university centers either.

Figure no. 118 Number of researchers at the level of development regions, 2010 - 2015



Source: processed data from National Institute of Statistics 2017

Figure no. 119 Number of researchers per counties of the South-East region during 2010 - 2015



Source: processed data from National Institute of Statistics 2017

Units dealing with research and development activity in the South-East Region

The national research development system includes entities that implement research and development activities. This system consists of all the units and institutions of public law and private law with legal personality, which have as their object research and development (Ministry of Research and Innovation, 2017).

According to the Law no. 324/2003 related to the approval of the Government Ordinance no. 57/2002 on scientific research and technological development, the R&D system of

national interest includes the following categories of public law units, with authorized legal personality:

- a) national research and development institutes;
- b) research institutes, centers or research centers of the Romanian Academy and research and development of branch academies;
- c) authorized higher education institutes or their structures;
- d) institutes or research-development centers organized within national societies, national companies and autonomous regies of national interest.

The following categories of units and institutions are also included in the national R&D system:

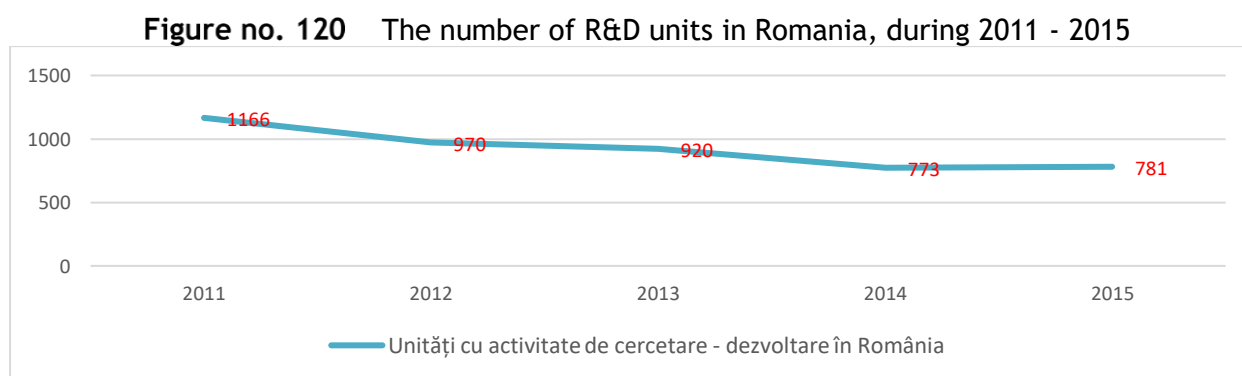
A. Units and institutions of public law:

- a) institutes, centers or research-development centers organized as public institutions;
- b) institutes or research and development centers organized within national societies, national companies and autonomous administrations or central and local public administration;
- c) international research and development centers set up under international agreements;
- d) other public institutions or their structures, which have research-development activity.

B. Units and institutions of private law:

- a) research and development units organized as trading companies;
- b) companies, as well as their structures, which have as object the research-development activity;
- c) authorized private higher education institutions or their structures.

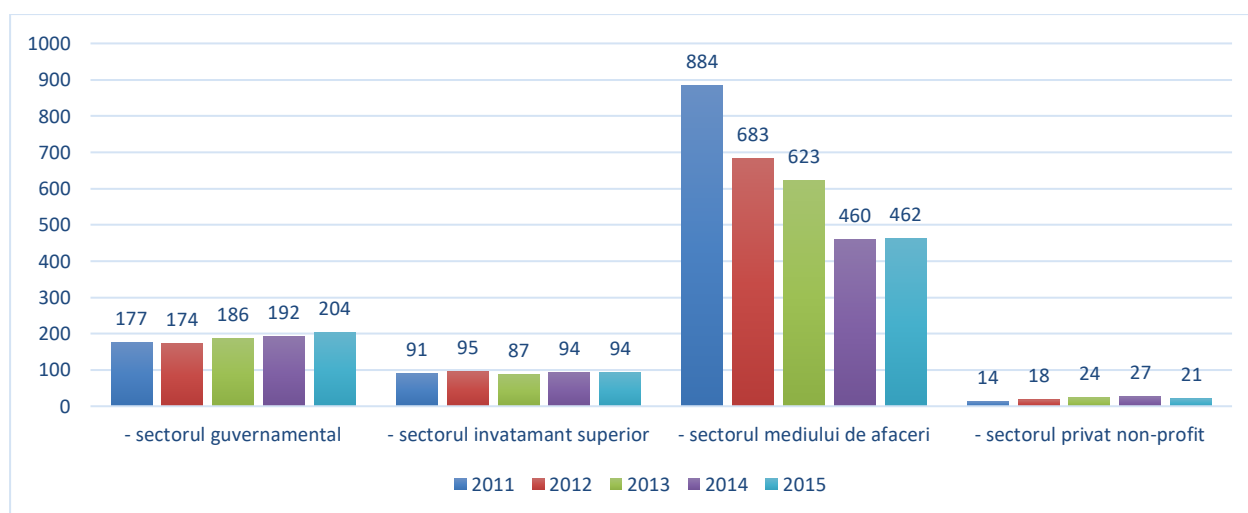
In Romania, in 2015 there were 781 research and development units, a continuously decreasing number between 2011 and 2015.



Source: processed data from the National Institute of Statistics 2017

In what concerns the performance sector, most R&D units were in the private sector (483 units) in 2015, with 298 units in the public sector. However, it can be seen in the graphic below that the number of units in the business sector is continuously decreasing in the analyzed period, from 884 units in 2011 to only 462 units in 2015. It is also noted a slight increase in the number of R&D units in government and non-profit sectors.

Figure no. 121 Research and development units, by performance sectors, at national level, during 2011 - 2015



Source: processed data from the National Institute of Statistics 2017

At the level of the South-East Region in 2014, 26 local units implemented research, development and innovation activities, representing only 3.27% of the total at national level. The South-East Region is thus the last region at national level considering the number of RDI units.

a. National Research and Development Institute.

According to the Ministry of Research and Innovation, the R&D institutes are a form of institutional organization specific to the R&D activities, established to ensure the implementation of these activities, as well as to strengthen the scientific and technological competence in the areas of national interest, in line with Romania's development strategy. At the level of the South-East Region, the following national research institutes operate:

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- **The Danube Delta National Research and Development Institute - INCDDD Tulcea**
 - o The main business objective comprises:
 - research and development on the structure, evolution, functioning and modeling of ecosystems, wetlands; sustainable valorization of biological resources;
 - evaluation and reduction of anthropogenic impact;
 - restoring ecosystems;
 - ecological reconstruction;
 - restoration of populations of declining species;
 - harmonization of economic and social interests;
 - organic agriculture;
 - wetland resource management, development and GIS applications;

- **The National Institute for Research and Development for Marine Research "Grigore Antipa" - INCDM Constanta**
 - o The main activity of this institution includes RDI activities in the field of:
 - ecology and protection of the marine environment, oceanography, marine engineering, resource management;
 - research on the structure, operation, evolution, modification, modeling of marine ecosystems;
 - ecological productivity.
 - technologies and solutions for the prevention of coastal erosion;
 - ecological rehabilitation and recovery;
 - investigation of the marine environment;
 - aquaculture and resource industrialization;
 - fishing. It produces equipment for the exploration and exploitation of resources;
 - strategies, consultancy, assistance, expertise, methodologies.

- **The National Research Institute - Development for Marine Geology - GeoEcoMar**

is the national pole of excellence in research and counselling in geological, geophysical and marine geological, costal and interior waters, as well as a reference center for Marine and Earth Sciences.

b) Institute, centers or research stations of the Romanian Academy and research and development of branch academies

In what concerns the institutes, the centers and foundations under the Romanian Academy, at the level of the South-East Region there are the following research centers:

- Sulina Ecological Research Station (it belongs to the Institute of Biology of the Romanian Academy)
- The Pătârlagele Natural Hazard Research Center (it belongs to the Institute of Geography of the Romanian Academy)

c) Authorized higher education institutions or their structures

In Romania, in 2015 there were a number of 103 higher education institutions (the quality barometer of the higher education system, ARACIS 2015), in which there are 590 faculties functioning.

In terms of regional distribution, 17 institutions/159 faculties are located in the Bucharest-Ilfov region, in the North-West region there are 15 institutions/96 faculties, in the Center region there are 13 institutions/73 faculties, there are 14 institutions/70 faculties in the North-East region, in the South-East region there are 7 institutions/53 faculties, in the South Muntenia Region there are 4 institutions/39 faculties, in the West Region - 12 institutions/65 faculties, in the South-West Region Oltenia there are 4 institutions/35 faculties.

The South-East Region has 7 higher education institutions. These are classified according to the following table:

Table no. 8 Higher education institution in the South-East region

Authorized higher education institutions or their structures				
Civil State Higher Education Institutions:				"OVIDIUS" UNIVERSITY CONSTANȚA THE MARITIME UNIVERSITY OF CONSTANȚA "DUNĂREA DE JOS (LOW DANUBE)" UNIVERSITY IN GALAȚI
Military state higher education institutions:				THE "MIRCEA CEL BATRAN" NAVAL ACADEMY OF CONSTANȚA
Authorized private higher education institutions:				"DANUBIUS" UNIVERSITY IN GALAȚI "ANDREI ȘAGUNA" UNIVERSITY CONSTANȚA
Private higher education institutions authorized to operate on a temporary basis				"GAUDEAMUS" FOUNDATION - "TOMIS" UNIVERSITY OF CONSTANȚA

Source: Ministry of National Education, 2017

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Also, according to South-East RDP 2014-2020, at the South-East region level, there were branches of state or private universities which were functional as follows:

Table no. 9 Branches of state or private universities in the South-East Region

County	Branches/territorial centers
Buzău	Academy of Economic Studies in Bucharest, Territorial Distance Learning Center in Buzau University of Bucharest - Faculty of Psychology and Educational Sciences Bioterra University - Engineering and Management in Public Food and Agrotourism - BUZAU Military Institute "Aurel Vlaicu"
Vrancea	Bioterra University - Engineering and Management in Public Food and Agrotourism - Focsani "Dunărea de Jos (Low Danube)" University - ID Territorial Center "Transilvania" University Braşov - Territorial ID Center The University of Bucharest "Danubius" University of Galati Bioterra University "Spiru Haret" University of Bucharest "Petre Andrei" University of Iasi
Tulcea	Ecological University of Bucharest

Source: RDP South-East 2014 - 2020

In what concerns the educational offer of state and private institutions regarding the number of faculties, fields and programs of bachelor degree studies in the academic year 2014/2015, at the level of the South-East region there is a total number of 42 faculties, 216 bachelor programs that can cover a maximum of 15,223 students.

Table no. 10 Educational offer of state and private institutions on the number of faculties, fields and programs of bachelor degree studies in the academic year 2014 - 2015

Higher education institution	No. facult.	No. bachelor fields	Nu. Bachelor programmes	Maximum no. of students that can be educated
Ovidius University of Constanta	16	49	87	5996
Maritime University of Constanta	2	6	13	1240
"Dunărea de Jos (Low Danube)"	14	55	81	4912

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University Galati				
The Naval Academy "Mircea Cel Batran" Constanta	2	4	9	595
"Andrei Saguna" University of Constanta	4	9	9	805
"Danubius"	3	7	15	1400
"Gaudeamus" Foundation - "Tomis" University of Constanta	1	2	2	275

Source: Barometer of the quality of the higher education system, ARACIS 2015

In the category of units and public institutions there are institutes, centers or stations of research and development organized as public institutions.

Thus, at the level of the South-East Region, there are the following research and development institutes and research stations subordinated to the "Gheorghe Ionescu-Sisesti" Academy of Agricultural and Forestry Sciences:

- Constanta Research and Development Plant for Fruit Growing;
- Agricultural Research and Development Resort Valu Traian;
- Braila Agricultural Research and Development Center;
- The Potato Culture Development Center, Tulcea county;
- The Bujoru Viticulture and Wine Development Research Station, Galati county;
- The Murfatlar Viticulture and Wine Growing Development Station, Constanta county;
- Odobesti Viticulture and Wine Production Development Station, Vrancea county;
- Buzău Vegetable Research and Development Station, Buzău county (Public institution with full financing from own incomes (extra budgetary));
- Dulbanu Cattle Growth Research Station, Buzau county;
- Research and Development Institute for Palatinate and Goat Growing, Constanta county;
- Research and Development Institute for Aquatic Ecology, Fisheries and Aquaculture Galati.

According to the ERRIS platform - Engagement in the Romanian research infrastructure system, the following units and institutions are included in the R&D system of the South-East Region:

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Units and institutions	RDI activity implemented
<p>CEPROHART SA - Research and Development Institute for the Cellulose and Paper Industry of Romania</p> <p>County: Braila</p> <p>Legal status: Shareholding company with 58.76% state capital and 41.24% private capital</p>	<p>The company carries out research-development services for the cellulose and paper industry and other related fields. It produces and sells specialty papers: filter media for food liquids, security paper for value papers, food wrapping paper, qualitative filter paper, electrical insulating papers, papers and special cartons for copying and printing.</p> <p>Infrastructure list:</p> <ol style="list-style-type: none"> 1. CEPROHART - Laboratory for Physical and Mechanical Testing of Cellulose, Paper and Cardboard - Laboratory Tests for Physical Cellulose, Paper and Cardboard; 2. CEPROHART - Laboratory Preparation and Stock Dose Additive - Laboratory for Fibers Pasta Preparation and Dosage of Chemical Additives; 3. CEPROHART - physical - chemical laboratory analysis - physico-chemical analysis laboratory.
<p>EURO CAMPUS SRL</p> <p>County: Buzău</p>	<p>Main activity Research and development of biotechnology.</p> <p>Fields of specialization: Intelligent Energy, Environment and Climate Change and Bio Economy..</p>
<p>SC TEHNOMET SA</p> <p>County Buzău</p> <p>Legal status: shareholding company, with entirely Romanian private capital.</p>	<p>In a period of over 7 years of activity, it has undergone several stages of development, ranging from the simple production of spare parts for various machinery and installations to the manufacture of products and equipment of great complexity, including its own design.</p>
<p>Romplast SA; RECOMPLAST SRL</p> <p>County: Buzău</p>	<p>Producer of Equipment and Accessories for Electrical and Lines and Low Voltage Terminals.</p> <p>Recomplast & Romplast Buzau makes the most of the products based on patents, designs/industrial designs, trademarks registered with OSIM: Monophased and Three Phase Protection Blocks (BMPM, BMPT-Patent</p>

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Units and institutions	RDI activity implemented
	No 116131), Devices (OSIM Patent No. 118155), Toothed Clamps (CDD) for Electrical Connections, One-Phase Branch Universal Clamps (CUIBM Patent No. 114848), Power Tension Clamps, Electrical Connection, Fittings (OSIM Patent No. 113409), Electrical cables and conductors, Insulators and Chains of composite insulators for Air Lines.
SC SMC MANAGER SA County Galați	Research, Design and Production of Technological Equipment, Installation Constructions, Execution of Turn-Key Separation Works, Industrial-Filtration, Sewage Treatment and Wastewater Treatment, Industrial Automation Systems, Specific Application Software.
GRUPUL DE MASURATORI SI DIAGNOZA SRL County: Galați	Testing and technical analysis activities - NACE Code 7120
BALNEAR AND RECOVERY SANATORIUM TECHIRGHIOI County: Constanța	The Balnear and Recovery Techirghiol Sanatorium benefits from the existence of one of the most modern balneo - physical - kinetic treatment bases in our country, also carrying out research in the field.
ROMÂNIA-EUROEST SA County: Constanța	<ul style="list-style-type: none"> - Planned revisions and accidental repairs to steam-engines - Modernization of steam-engines - Removal of steam-engines, with or without warm maintenance, including the possibility of personal accommodation - Supply/completion of water for the cooling system - Replacements/additions and physico-chemical analyzes of lubricants - Technical interventions for accidental defects by means of transport and specialized team
AVICOLA SA LUMINA	Research activities: Utilization of the sun-products of wine making as

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Units and institutions	RDI activity implemented
County: Constanța	natural antioxidants for polystyrene fatty acid enriched hens; Producing a new egg assortment with impact on maintaining consumer health through its naturally improved nutritional qualities.
SOFT STEEL BUILDING SRL County: Constanța	Electro Mechanical Engineering Consulting Company with major expertise in marine engineering.

In the South-East Development Region there are other companies that carry out research, development and innovation activities such as:

Units and institutions	RDI activity implemented
SC VARD S.A. Location: Brăila, Tulcea	Naval design activities
SC GREENTECH S.A.	The company has a specialized RDI department; Collection services of PET bottles and their recycling. Manufacturer of PET and r-PET band, PET flakes, PET granules (used as raw materials in various industries)
SC EXIM PROD GRUP SRL Location: Buzău	Group of companies focusing most of their activities in the energy sector. Produces products, equipment and services for the transport and distribution of energy, participating in the development of renewable energy sector in Romania.
SC Erika Power System S.R.L. Constanța	IT Service Provider for Small and Medium Enterprises in Romania.
SC CAMIRO Engineering S.R.L. Constanța	The company creates added-value by collaborating in identifying the R&D and innovation needs of economic operators, implementing and promoting the results of research, development and innovation, offering competitive solutions in the field of innovation services, technology transfer and spare parts for equipment for the industry machine building, oil and

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Units and institutions	RDI activity implemented
	gas industry, shipbuilding and repair, agriculture, food industry.
SC UZINSIDER ENGINEERING S.A. Galați	The company offers multidisciplinary design, consulting and technical expertise services for: industrial technological equipments, mechanical equipments, hydraulic installations, pneumatic installations, centralized grease and oil lubrication installations, lifting and transport heating equipment and heating treatment electrical installations, supervision systems, control and monitoring industrial processes, automation with programmable automatic machines and Industrial PCs, industrial constructions, public buildings, residential buildings, warehouses, idyll networks, PSI and civil shelters, rehabilitation and consolidation of existing constructions, hydro technical installations, installations for wastewater treatment plants and recycling of industrial and domestic wastewater, drinking water supply stations, indoor and/or outdoor hydraulic networks.
SC ALUM SA Tulcea	It is the only alumina refinery in Romania.
SC EVO BIZ STUDIO SRL Vrancea	Company specializing in dedicated web services.
SC DMF POLIPLAST SRL	The company has RD production department. It activates in the field of plastic production, focusing on two main categories of products: flexible polyethylene and polypropylene films and PET bottles.
BIOSYS GROUP SRL Constanța	Scientific research and environmental studies as a company authorized by the Ministry of Environment; package of studies requested by the Environment Agency.
OCEANOGRAFICA SRL Agigea	Activities for manufacturing instruments and devices for navigation control verification measurement.
ECO BIO MAGIC SRL Constanța	Decontamination activities and services; products and services designed to protect the environment that

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Units and institutions	RDI activity implemented
	provide a significant reduction in pollution, but also a new approach to the sustainable development of all activities that may generate potential pollution.
ECO TECH SERVICE SRL Constanța	Activity: Ecology and environmental protection. High Efficiency depollution technology
OIL DEPOL SERVICE SRL Constanța	Industrial washing; Neutralization of hazardous waste; Authorized transport of hazardous waste; Reconstruction of land contaminated with petroleum products; Cleaning tanks / separators / lagoons; Soil / sludge bioremediation containing dangerous substances.
Branic SRL Constanța	Activities in the field of protection, depollution and protection of the environment by specific means. Wrought iron works, metallic constructions and electrical and sanitary installations.
SENATOR PRODIMPEX ROMANIA SRL Vrancea	It offers varieties of Romanian wine and works to obtain international varieties highlighting the Romanian terroir. It exploits four vineyards of the most important oenological areas in Romania: Husi, Haslusa, Vrancea (Cotesti, Odobești and Panciu), Tirol (CS)
DMF POLIPLAST SRL Vrancea	Manufacture of plastic plates, sheets, tubes and profiles
TC INF SA Galați	Software made to order
F5 IT SOLUTIONS PARTNER SRL Constanța	Custom software development activities (customer oriented software)
COSMETICS & SPA S.R.L. Constanța	Creator and manufacturer of dermato-cosmetic products, launched in 2014, therapeutic, antirheumatic. SPA services using their own products.
BIODAM S.R.L. Tulcea	Romanian company with private capital, active in the field of production, processing and trade in grains, oils and ecological grapes, established in 2006. Only organic products, cultivated on certified organic surfaces.
MAGISTRA C&C S.R.L.	Manufacturer of generic medicines for human use.

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Units and institutions	RDI activity implemented
Constanța	
GREENFIBER INTERNATIONAL S.A. Buzău	Manufacture of synthetic and artificial fibers
PRUTUL S.A. Galați	Manufacture of oils and fats
BRAICONF S.A Brăila	Manufacture of underwear
Tehno Bionic SRL Buzău	Production of instruments to reproduce the effects of salt mining therapy: environmental cleaners and inhalers for medical use endorsed by the Ministry of Health.
ALMERA INTERNATIONAL SRL Galați	Manufacture of dairy products and cheese
TRANSMEDIKA PROJECTS SRL Constanța	ROmobility- The most modern self-service luggage storage service is available non-stop, 365 days a year.
ARTECOM SRL Vrancea	Manufacture of other rubber products.

g) Regional innovation and technological transfer activity

One of the national goals to increase the performance of public and private organizations is related to increasing the innovation capacity. The overall objective of the National Strategy for Research, Development and Innovation 2014-2020 is to increase the competitiveness of the Romanian economy through innovation, aiming to support the performance of economic operators on global value chains. The strategy supports the transition from cost-based competitiveness to innovation-based competitiveness. This implies developing companies' ability to absorb modern technology, adapt these technologies to the needs of the markets they serve, and develop technologies or services that enable them to progress on value chains (NSRDI 2014-2020).

Generally considered to be the main driver of the economic growth, the innovation has been defined in a variety of ways by different specialists, but today there is no unanimously accepted definition.

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Thus, innovation can be defined as a succession of activities that want to transform one or more ideas into products or services for the market, which refers to their transformation into money.

Any change made by the firm in order to improve its economic situation, its market position, the working conditions of the personnel or the protection of the environment, is an integral part of the innovation process. Innovation can be applied to product, process, marketing, organizational structure and even to its management.

Product Innovation - is a new or improved product or service in terms of technical specifications, components, materials, software, user-friendly attitude or other functional features;

Process innovation - refers to a new or improved production or delivery method for techniques, equipment, or software;

Marketing innovation - involves a new marketing method relevant to changes in product design or packaging, product placement, product promotion or pricing;

Organizational innovation - it is relevant for the new organizational methods in business practices, the organization of the workplace or the external relations of a firm.

Management innovation - it is relevant for the management principles and processes that eventually change the managerial practice (Oslo Manual, 2005).

The innovation process, representing a future investment on the short term, should be driven as any other conscious activity that creates benefits for the society. Therefore, for this aspect there are needed specialized managers in this field, ie innovation managers.

The innovative company is the one that implemented an innovation over a period of time, that launched new or significantly improved products or services on the market or introduced new or significantly improved processes or new methods of organizing, marketing or management. An innovative product and process company is the one that has implemented a new or improved product or process within a certain period of time.

The term covers all types of innovators, product innovators, processors, organizational methods, marketing or management methods, as well as enterprises with incomplete or abandoned innovations and it refers to active enterprises.

The innovative activities are all those of a scientific, technological, organizational, financial and commercial nature that update or are oriented towards implementing innovations. Some innovative activities are themselves inventive, while others are not innovative but they are necessary to implement innovations. The innovation activities also

include research and development that are not directly related to the development of specific innovation. A common feature of an innovation is that it can be implemented. A new or improved product is implemented when it is placed on the market.

The European Commission elaborates a monitoring report on the main innovation indicators, giving an overview of the Member States' progress towards the 2020 targets. The 7th edition of the 2016 Regional Innovation Scoreboard presents a comparative assessment of the innovation performance in 214 regions in 22 EU Member States and Norway. In addition, Cyprus, Estonia, Latvia, Lithuania, Luxembourg and Malta are included at national level, as there is no regional administrative level as such in these countries.

In this report, the countries are classified into four different innovation performance clusters. Europe's regions have been ranked as: regional innovation leaders (36 regions), major regional innovators (65 regions), moderate regional innovators (83 regions) and low-level regional innovators (30 regions). In Europe, the excellence in innovation is concentrated in a small number of countries. All 36 EU regional innovation leaders are located in only seven EU Member States: Denmark, Finland, France, Germany, the Netherlands, Sweden and the United Kingdom. In Austria, Belgium, Bulgaria, the Czech Republic, Hungary, Ireland and Romania, all regions are in the same performance group, and in 12 countries there are two different regional performance groups. There are only three different regional performance groups (the Innovation Scoreboard 2016) in four larger Member States (France, Germany, Italy and Spain). As it can be seen from the below graphic, all the development regions in Romania are in the category of low-level regional innovators, due to a low number of research, development and innovation units, to the very low financial resources devoted to innovation, inconsistent innovation policies and a small number of staff involved in R & D and innovation.

Table no. 11 EU countries by innovation performance clusters, 2016

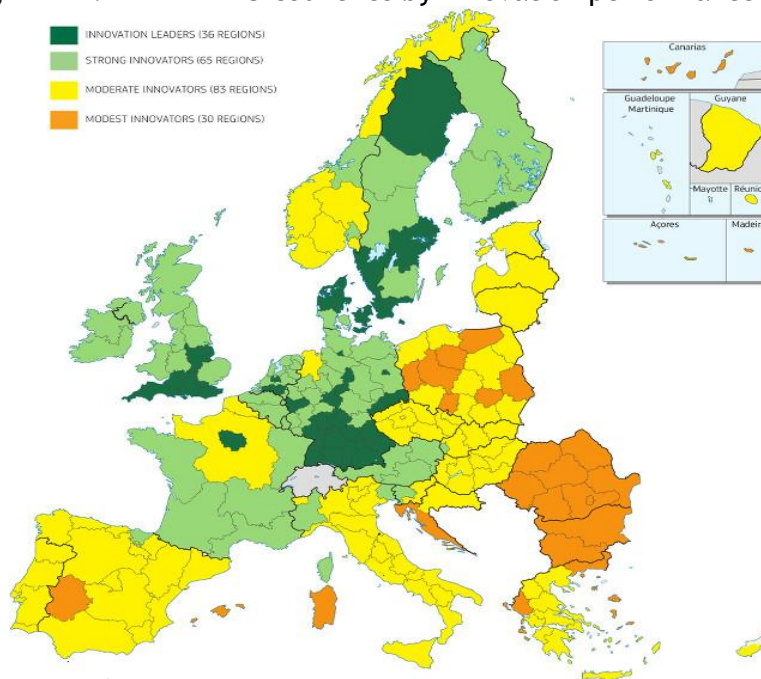
Innovation Performance Group	EU member states
Leaders in innovation	Sweden, Denmark, Finland, Germany, the Netherlands
Major innovators	United Kingdom, Ireland, Belgium, Luxembourg, Austria France, Slovenia
Moderate innovators	Norway, Cyprus, Estonia, Malta, Czech Republic, Italy, Portugal, Spain, Greece, Hungary, Slovakia, Poland, Lithuania, Croatia, Latvia

Low level innovators

Bulgaria, Romania

Source: Regional Innovation Scoreboard 2016

Figure no. 122 EU countries by innovation performance clusters, 2016



Source: Regional Innovation Scoreboard, 2016

According to the Global Innovation Index, Romania registered an index of innovation of only 37.9% in 2016, with the largest index being found in Switzerland, Sweden, the United Kingdom, the United States, Finland or Singapore. This index in Romania is decreasing compared to the previous years, 38.1% in 2015 and 38.1% in 2014.

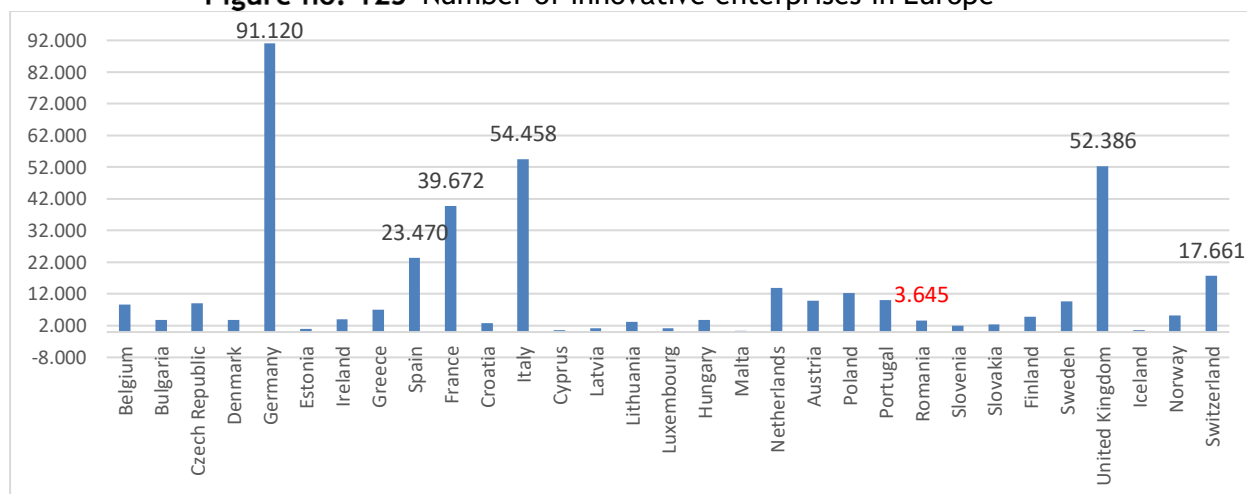
The South-East Region is a region with a low level of innovation. According to the Regional Innovation Scoreboard 2016, the innovation performance in the region decreased with 9% compared to 2014.

Innovative enterprises

There are 3,645 innovative enterprises in Romania, a number that has decreased dramatically compared to the level in 2010, when there were 8,116 enterprises in our country. Compared with other EU countries, it is noticed that Romania has a very small number of innovative enterprises, the first being Germany, Italy, the United Kingdom, France, Spain and Switzerland. The causes of this decrease are numerous, the most significant ones being the lack of coherent governmental programs to support and encourage innovative activities, the small number of staff involved in R&D activities, the

reduction of the number of programs for financing innovative activities and the low number of public-private partnerships for innovation.

Figure no. 123 Number of innovative enterprises in Europe

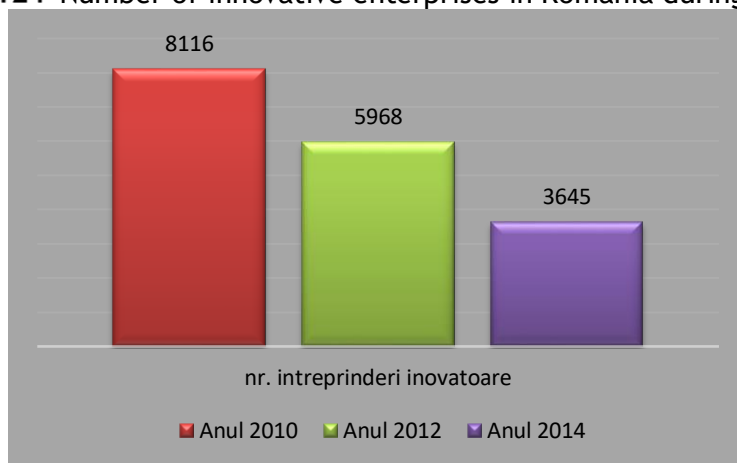


Source: Eurostat, 2017

In what concerns the typology of innovators, it can be seen that most innovative enterprises in Romania have only organizational and/or marketing innovation (1,805 enterprises), the product or process innovation being considered more difficult to be achieves and the number of successful innovators is 1,529, compared to 2010.

The evolution of the number of innovative enterprises during the analyzed period is illustrated in the below graphic.

Figure no. 124 Number of innovative enterprises in România during 2010-2014

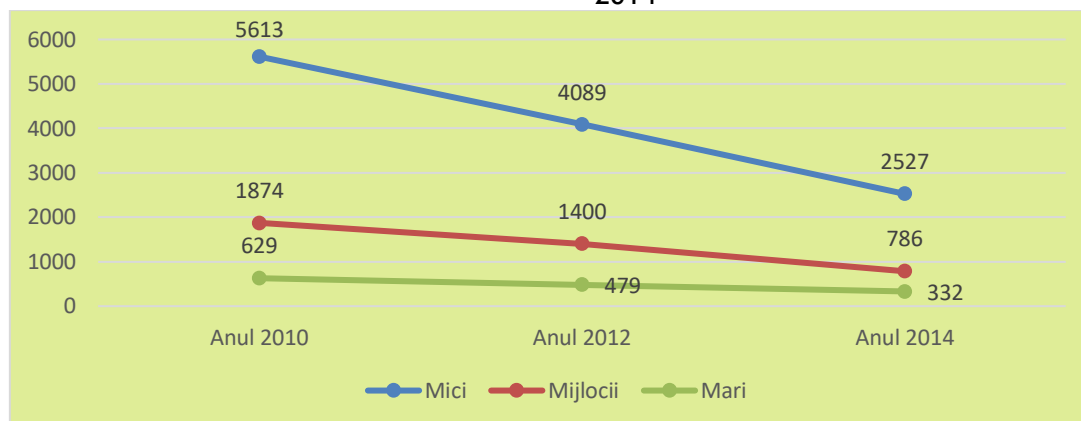


Source: processed data from the National Institute of Statistics 2017

The above graphics shows a downward trend, the number of innovative businesses decreasing from 8,166 in 2010 to 3,645 in 2014.

In terms of size classes, the most innovative businesses are small, with only 332 large organizations.

Figure no. 125 Innovative enterprises by size classes at national level during 2010 - 2014



Source: Source: processed data from the National Institute of Statistics 2017

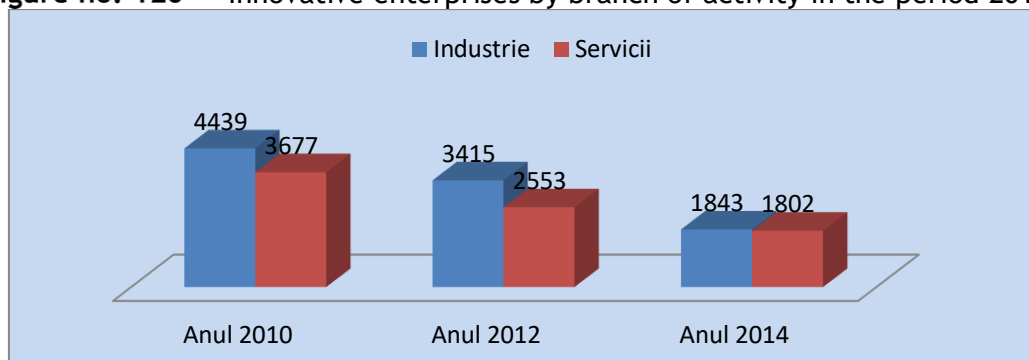
Analyzing the period 2010-2014, it is noticed that in 2010 from the two types of studied activities (industry and services), the percentage of innovative enterprises having industry branch is 54,69% (representing 4,439 enterprises) and the percentage of the innovative enterprises with services branches is 45.30% (representing 3,677 innovative enterprises).

Among the studied period, the number of innovative enterprises declines considerably, reaching 1,843 enterprises with industry-related activities in 2014 and 1,802 innovative enterprises with services activities. For industry, on average 62.52% of the studied period are small innovative enterprises and 76.51% are small innovative enterprises in the services field.

It is noted that among the types of industries mentioned above, the most innovative enterprises are in the manufacturing sector - 4,143 in 2010, the basis year, and 1,754 in 2014. The other branches of industry also decrease during the studied period, but their number is insignificant compared to those in the manufacturing industry.

It can be noticed that the share of innovative enterprises by size in total innovative enterprises has the highest share over the whole period analyzed.

Figure no. 126 Innovative enterprises by branch of activity in the period 2010-2014



Source: Own calculation, National Institute of Statistics 2017

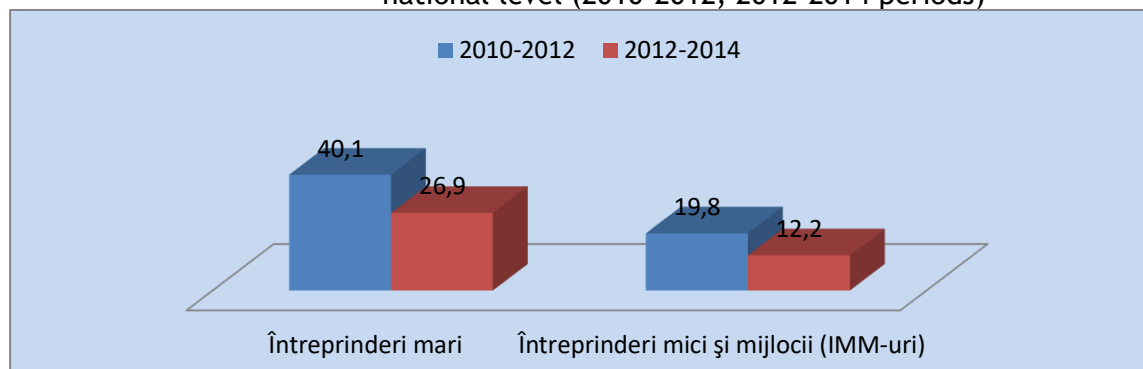
According to the above graphic, it can be noticed that in 2010 there were 4,439 innovative enterprises with activity in industry and 3,677 branches in services filed. Both of them decreased, but the industry was more dramatic, reaching almost the same number in 2014: 1,843 for industry and 1,802 for services.

According to INSSE press release on statistical surveys of innovation, it is shown that during the period 2012-2014, the share of enterprises that introduced or implemented products, processes, marketing methods, etc. was 12.8%, 7.9 percent less than the 2010-2012 period.

Out of these, 3.5 were enterprises that introduced or implemented only new or improved products or processes, while 6.3% were enterprises that only applied new organizational or marketing methods. 3% of the total number of enterprises introduced both new products and/or processes, as well as significant and new organizational and/or marketing methods.

Analyzing the statistical data, it can be seen that large enterprises are twice as innovative as small and medium-sized enterprises.

Figure no. 127 Share of innovative enterprises, by size class of employees at national level (2010-2012; 2012-2014 periods)



Source: own calculations

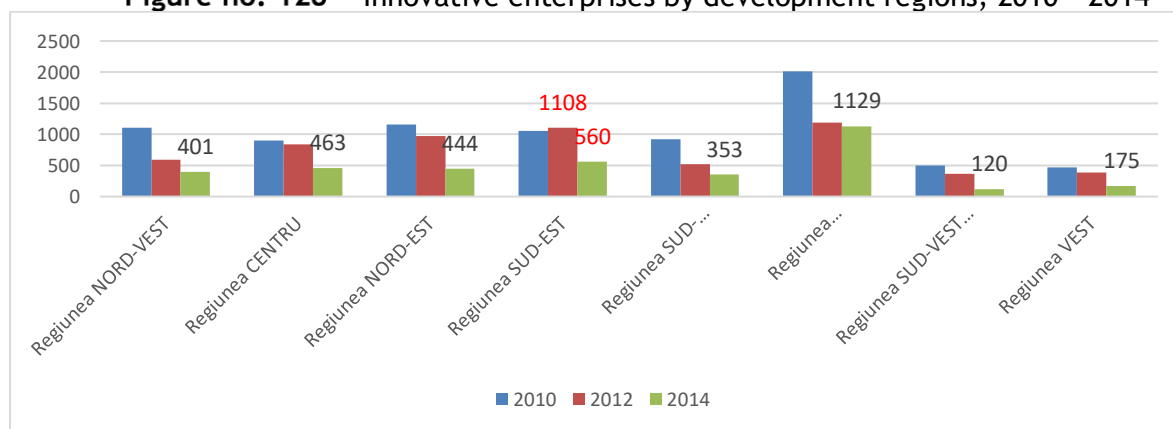
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In the 2012-2014 period, small and medium-sized enterprises (SMEs), having between 10-249 employees, were less innovative than large enterprises with 250 employees and over.

Out of the total large enterprises, 26.9% were innovative, while among small and medium enterprises only 12.2% were innovative. Compared to the 2010-2012 period, the share of large innovative enterprises decreased by 13.2 percentage points, from 40.1% in 2010-2012 to 26.9% in 2012-2014. The same declining trend was seen among innovative SMEs, which from a 19.8% share in the period 2010-2012, reached only 12.2%, decreasing with 7.6 percentage points.

At territorial level, the most innovative enterprises are located in the Bucharest-Ilfov region and the fewest are in the South-West Oltenia region. In what concerns the South-East region, the number of innovative enterprises decreased from 1108 in 2012 to just 560 in 2014. The decline in the number of innovative enterprises over the analyzed period can be determined by the lack of funding opportunities after 2013, but also by the unstable economic environment that does not encourage sustainable innovation activities.

Figure no. 128 Innovative enterprises by development regions, 2010 - 2014



Source: National Institute of Statistics, 2017

According to Inobarometer 2011, the South-East Region had an innovation degree of 28.84%, being ranked 5th among the regions at national level.

Table no. 12 Score on Innovation Factors of the South-East Region

South-East	Innovative leadership potential	The potential to create knowledge	The ability to innovate and to be incorporated into a relational system	Performance of innovation activities	Intellectual property
	29,63	5,14	42,37	47,98	7,66

Source: Inobarometer, 2011

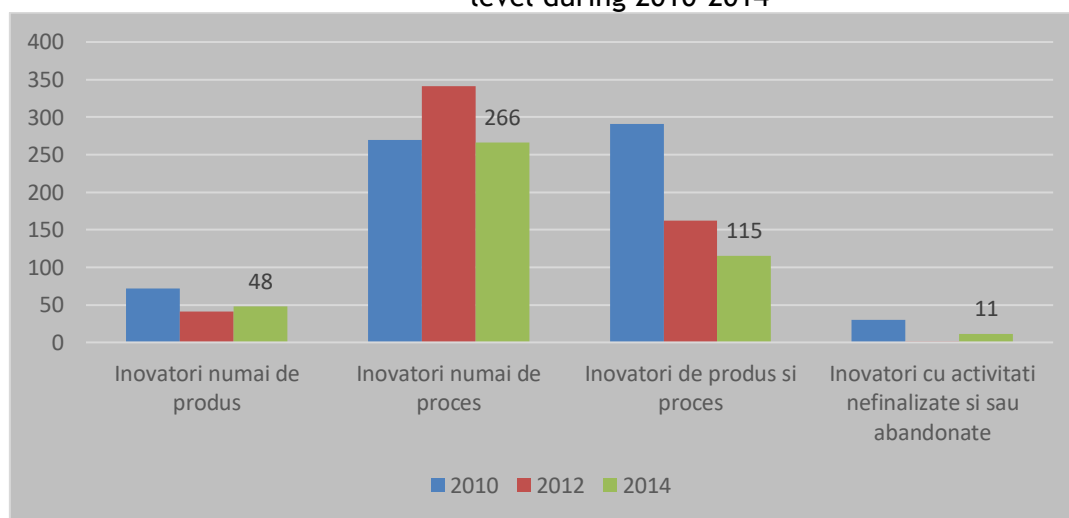
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By size classes, in 2014, most innovative enterprises in the South-East Region were small enterprises (380), followed by medium-sized enterprises (136) and only 44 large enterprises. 323 innovative enterprises were active in industrial activities and 237 in services.

Also, as shown in the following graph between 2010-2014, in the South East Region, product innovation enterprises have reduced their number from 72 to 48, the number of process innovators remained relatively constant, while the number of innovators of both products and processes was reduced from 291 to just 115.

In 2014, the share of innovative enterprises was 31% from the total, having a decrease of up to 13% in 2014. Regarding the South-East Region, the share has also decreased from 37% in 2010 to 18% in 2014. For both sectors of activity analyzed, industry and services, the trend is similar. However, in the last year of analysis, the share of innovative enterprises in industry is with one percent higher than in services.

Figure no. 129 Enterprises with product and / or process innovation at regional level during 2010-2014



Source: National Institute of Statistics, 2017

Accredited and provisionally authorized entities in the innovation and technology transfer infrastructure

The research infrastructure in Romania includes, besides institutes, research units and universities, and a number of accredited and provisionally authorized entities for the innovation and technology transfer infrastructure. There are 36 accredited entities and 4 provisionally authorized entities in Romania.

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In the South-East Region, there are two technology information centers, one in Constanta county, in the field of agri-food and renewable energies and the second one in Tulcea County, in the field of environment, tourism and sustainable development. Also, a Technological Transfer Center was provisionally authorized in Galati, within the "Dunărea de Jos" („Low Danube”) University.

Table no. 13 Entities accredited and provisionally authorized in the innovation and technology transfer infrastructure

No.	Entity name	Entity type	The domain for which the entity was accredited	County	Legal status
1.	Center for Technology Information CIT- C.C.I.N.A. Constanța	Center for Technology Information - (currently it is no longer accredited)	Agro-food, construction, services for SMEs, environment, renewable energies	Constanța	Without legal personality within the Chamber of Commerce, Industry, Navigation and Agriculture of Constanta
2.	CIT Danube Delta	Center for Technology Information	Environment, tourism, sustainable development	Tulcea	No legal personality within NIRD for Environmental Protection, subunit "Danube Delta" National Research and Development Institute
3.	Technology Transfer Center CTT UGAL	Technology Transfer Center	Temporary authorization Agriculture - food, biotechnology Energy, oil and gas and energy mining Construction of machinery and metal structures Agriculture, forestry and fishing Tourism Economy	Galați	No legal personality - existing within "Dunarea de Jos" („Low Danube”) University in Galati

Source: Ministry of Research and Innovation

Clustering potential of the South-East Region

The term cluster has been intensively debated in the international scientific literature, as there is no unanimously accepted definition. According to Michael Porter, the clusters are geographic based concentrations of institutions and interconnected companies that belong

to a particular field. The clusters include a group of related industries and other important entities from the competitiveness point of view (Clustero, 2017).

According to the national legislation, respectively GD 918/2006, the cluster is defined as a group of producers, users and / or beneficiaries, having as purpose the implementation of EU best practices in order to increase the competitiveness of the economic operators. Thus, the clusters generally include enterprises, universities and / or research institutes and public authorities.

In the following paragraphs, a presentation of the most important clusters from the South-East Region is provided, according to the website Clustero.eu:

1. Cluster Traditions Manufacture Future TMV South East.

Established in 2010, it aims to promote and protect the interests of trading companies that are production members in the field of textile, knitwear, leather, materials and services suppliers through actions that will contribute to the strengthening and development of their members for the medium and long term.

The companies, universities, research institutes and public authorities that are part of this cluster are:

Table no. 14 Members of the Cluster Traditions Manufacture Future

Trading Companies	Universities	Research Institutes	Public Authorities
SC SORSTE SA SC COMUNIVERS SRL SC COROLA SRL SC PRODECOM SRL SC INMARTEXTIL SRL SC TRICOTTON PNCIU SRL SC CONTEMPO SRL SC SERITEX SRL SC VERON SRL SC TOORICH SRL	Faculty of Textiles, Leather and Industrial Management Iasi University of Arts and Design Cluj-Napoca	The National Research and Development Institute for Textiles and Leather Bucharest	Agency for Regional Development South-East

2. Romanian River Transport

The cluster *Romanian River Transport* was established with the purpose of creating a unitary framework for cooperation and collaboration between its members, of accomplishing missions / objectives of common interest regarding the establishment of the cluster for the ecological intermodal transport of Romanian domestic goods.

The members of this cluster are presented in the following table:

Table no. 15 Members of the cluster Romanian River Transport

Universities	Research Institutes	Public Authorities	Catalysts	Other members
<p>"Danubius" University in Galați</p> <p>"Low Danube" University in Galați</p> <p>Naval Academy "Mircea cel Batran" in Constanta</p>	<p>SC IPA SA Bucharest, Galați</p> <p>Subsidiary, Romanian Center for Staff Training and Development (CERONAV)</p>	<p>Municipality of Galați</p>	<p>THE UNION OF THE ROMANIAN INLAND PORTS (UPIR), Industrial Parc SRL</p>	<p>"Administration of Maritime Danube Ports" National Company- SA Galați (CN APDM SA);</p> <p>"Administration of the Danube River Ports" National Company- SA Giurgiu (CN APDF SA);</p> <p>"Administration of Navigable Channels" National Company- SA Constanța (CN CAN SA);</p> <p>National Association of Shipbuilders in Romania (ANCONAV),</p> <p>Industrial Parc SRL in Galați,</p> <p>Association of Shipowners and Port Operators in Romania (AAOPFR) in Galați,</p> <p>Romanian Navigation Company "Navrom" SA (CNFR Navrom SA),</p> <p>SC Romnav SA,</p> <p>SC Deltanav SA,</p> <p>SC Navrom Shipyard SRL,</p> <p>SC Cojar SRL,</p> <p>SC Romprima SRL,</p> <p>Regional Association for Energy and Environment Low Danube,</p> <p>Tehnopol Galați,</p> <p>SC Docuri SA Galați,</p> <p>SC Port Bazinul Nou Galati,</p> <p>SC Ecoarch SRL.</p>

3. Romanian Maritime Cluster

The Romanian Maritime Cluster was developed by an informal network that has consolidated the relationships between the major players of this sector of activity.

Main products/ services/ projects:

- promoting policies oriented towards the cluster industry, in national and european areas;
- promoting the activity of the Romanian Maritime Cluster;
- strengthening the cooperation between the various actors involved in the maritime sector, through contact, exchange of ideas and information and developing common activities;
- to support business and professional associations to meet their specific objectives;

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- support for innovation and entrepreneurship, in the maritime sector;
- support for SMEs and their productivity;
- specific assistance to companies to comply with the environmental protection requirements;
- establishing contact with other maritime clusters;
- attraction of funds, grants and other sources of income.

The members of this cluster are presented in the following table:

Table no. 16 Members of the Romanian Maritime Cluster

Companies	Universities	Research Institutes	Public Authorities	Catalysts	Other members
S.C. Fairplay Maritime S.R.L. CMA Ships Romania S.R.L. S.C. AB Crewing S.R.L. S.C. Doehle Manning Agency S.R.L. S.C. Seaway International S.R.L. S.C. Romtrust S.R.L. S.C. Project Management Solutions S.R.L. S.C. Ship Design Group S.R.L. Romar Communication Inc. S.R.L. S.C. Barklav S.R.L. Det Norske Veritas Romania S.R.L. S.C. Maritima BDS S.R.L. S.C. COMVEX S.A. Constanta South Container Terminal SRL S.C. Aries Interlink S.R.L. Celerco S.R.L. S.C. Nautiq Media S.R.L. S.C. Retec S.A. S.C. Atlantis Mar Group S.R.L. Bryte Consulting S.R.L. S.C. Duna Mar Trans S.R.L. The Green Seas Ltd.	"Low Danube" University Galați Maritime University of Constanta Naval Academy "Mircea cel Batran" Ovidius University in Constanța	National Institute for Marine Research and Development "Grigore Antipa"	The Autonomous Administration of the Low Danube River Administration National Company Navigation Channel Administration S.A. CN APDM SA Galați Romanian Naval Authority Autonomous Administration of Free Zone Braila	RoNoMar Foundation	CERONAV Constanța Portuary School Foundation Association of the Romanian Nautical College

4. Cluster for Healthcare “Dunărea de Jos” (Low Danube)

The regional cluster “For Health Dunarea de Jos (Low Danube)” was formed out of the desire for developing common projects with regards to the development of products and services that are meant to maintain the healthcare. The main objectives are: promoting information and education for healthcare; developing new techniques and systems and their promotion with the purpose of maintaining healthcare; improving access to the medical market; support and promotion of a unitary framework for healthcare of a decent life standard and healthcare among beneficiaries.

Members of this cluster are presented in the following table:

Table no. 17 Members of the cluster “For Health Dunarea de Jos (Low Danube)”

Universities	Research Institutes	Public Authorities	Catalysts	Other members
<p>”Danubius” University in Galați</p> <p>”Low Danube” University in Galați</p>	<p>SC IPA SA Bucharest, Galați</p> <p>Subsidiary ”Benone Pușcă” University Foundation</p>	<p>Municipality of Galați</p>	<p>”SMURD” Association Galați,</p> <p>Chamber of Commerce, Industry and Agriculture Galați</p>	<p>C.M.I. Dr. Marcu Costel Daniel,</p> <p>C.M.I. Dr. Marcu Carmen Mariana,</p> <p>SC DENTICARE IMPLANTALOGY CENTER SRL</p> <p>The Medical Students Society Galati (SSMG)</p> <p>St. Spiridon Homes for the Elderly The Cross-Border Cooperation Association ”Euroregiunea Dunărea de Jos (Low Danube Euroregion)”,</p> <p>Mistodie Cristina- Victoria- Primary Physician,</p> <p>RRA Rescue International Association.</p>

5. The cluster association Regional Green Solutions Low Danube

The cluster was founded by the “Danubius” University of Galați, Industrial Parc SRL, “Dunarea de Jos (Low Danube)” University of Galati and IPA S.A. Bucharest with the purpose of planning and carrying out services and activities aimed at promoting and

developing mechanisms for supporting the entire geographical area “Dunarea de Jos” (Low Danube), on the long run, as a leader in the sectors of renewable energy, energy efficiency and new sustainable energy and participation in international networking as project partner or coordinator for the increase of Association’s organizations competitiveness, through national and international cooperation.

Among the main activities of the cluster there are searching for solutions that promote unconventional and renewable energy, capitalizing on the energy technological potential and its application in the public and private sector, strengthening the transfer system of core research results to cluster members. The cluster aims to strengthen the research collaboration between universities, research institutes and companies, as well as to develop cluster development strategies at national and European level. The development of the cluster will be ensured by identifying sources of non-reimbursable funding and developing projects to obtain non-reimbursable funding, as well as attracting other resources (investments, state aid schemes, etc.). Other cluster activities will include facilitating economic exchanges between cluster members and organizations outside of the cluster, ongoing training programs for the members of the cluster, or cluster support and affiliation.

6. IT&C Cluster “Dunărea de Jos” (Low Danube)

IT&C Cluster “Dunărea de Jos” (Low Danube) Galati was set up in 2015 and has as main objectives the sustainable development of its members, the increase of the research - development capacity and the stimulation of the cooperation between research - development and innovation (RDI) institutions and enterprises, as well as increasing the access of enterprises to RDI. Currently, according to the cluster website, it has 37 members, both public institutions and companies that operate in the field of IT&C.

Other objectives of the clusters are:

- Capitalizing on the potential of information and communication technology and its application in the public sector (administration, education, healthcare) and the private sector (enterprises, citizens);
- Creating the premises for increasing the competitiveness of ICT enterprises, based on the intensive use of knowledge;
- Increasing regional competitiveness on education in IT;
- Representing the interests of the ICT environment in front of state organisms;
- Creating mechanisms for a collaborative approach towards large-scale international projects;
- Supporting entrepreneurship and SMEs in the field of ICT, from the region;

- Identifying and promoting a range of investment projects, both public and private, as well as proposals to modernize/improve strategies, policies and action plans in the field of ICT;
- Strengthening the cooperation between the various actors in the information and communication technology sector, exchange of information and ideas, and carrying out joint activities.

7. Advanced anti-counterfeiting technologies - INNOVATION CLUSTER

"Advanced anti-counterfeiting technologies - INNOVATION CLUSTER" - AACTIC was founded in 2015, having the following founding/ potential members:

SC CEPROHART SA, Brăila,

SC OPTOELECTRONICA 2011 SA Măgurele

Romanian Academy, Timisoara Subsidiary

Dunărea de Jos (Low Danube) University Galați

"Gh. Asachi" Technical University Iași

The National Institute for Research Development for Isotopic and Molecular Technologies Cluj Napoca

SC Datronic-NCIP SRL Timișoara

SC BARLETA SRL Bacău

SC FIBER LASER OPTICS SRL Măgurele

Nanoline optics SRL

SC L&G Consulting SRL

SC SELADO COM SRL, Brăila

Chamber of Commerce, Industry and Agriculture Brăila.

The main purpose of the Association is to increase the performance of the members with regards to the fight against counterfeiting of valuable documents, brands and commercial products.

8. MEDGreen CLUSTER Association

The aim of "Cluster" Association for the Promoting of Specialized Businesses in Ecotechnologies and Alternative Energy Sources (MEDGreen Cluster) is to facilitate and promote cooperation between businesses, business people, research and education institutions and other organizations contributing or supporting the innovative activities for

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delivering competitive national and international products and services, with high added value, and to generate jobs and sustainable development opportunities for Medgidia and neighboring areas.

The founding members are the Medgidia Municipality, SC Apollo Ecoterm SRL, SC ET Innovative Solutions SRL, SC ET Audit Energetic SRL, SC Solarom SRL, SC Ecohorneț SRL. According to the website of the association, it currently has another 14 associate members.

The services offered by the Cluster MEDGreen association are:

- Juridical consultancy;
- Consultancy for accessing funds;
- Consultancy for accessing financial services;
- Innovation services;
- International cooperation;
- Impact related studies;
- Maintenance services for biogas stations;
- IT services;
- Technological risk management services;

Among the cluster's fields of action are included the following:

- Establishment and development of collaboration relations between cluster member companies in a favorable business climate, respecting the rules of loyal competition, through own means and the efforts of the members;
- Collaborate with national and international governmental institutions to facilitate economic missions and business visits in the cluster's field of activity, in order to develop mutually beneficial economic cooperation;
- Supporting and promoting research and innovation activities of economic agents in the area, facilitating the transfer of policies, management, advanced technology;
- Organization of technical and economic events with major impact on the business and socio-cultural environment;
- Promoting new and renewable energy sources on the national and regional market;
- Promoting and harmonizing common activities in the field of environmental protection;

9. INOMAR Cluster

The mission of INOMAR Cluster from Constanta is to become the preferred way of interaction and communication for tourism operators, in order to innovate and reinvent the values of Dobrogea region.

The members of this cluster are: Multisoft, Dima Consulting Group, Tomis Antidrug Association, Rosiem House and Municipality Ovidiu.

Hereby are the main priorities of the cluster:

- Strengthening technology transfer for tourism;
- Capitalizing local resource potential;
- Extending the visiting season to 6 months;
- Attracting a larger number of active members into the cluster;
- Promoting operational quality and excellence regarding the “destination” management.

The main activities of the cluster are:

- Recording of the problems, challenges and opportunities;
- Adopting a quality standard for touristic experiences;
- Synchronizing the offer/request with the resources market for tourism;
- Financing and establishing a vocational training center regarding tourism.

10. Bio Danubius Cluster

The “Bio Danubius” cluster has the purpose of harmonizing and representing the interests of the entities, of the research, of the catalyst administrations and entities, in order to increase the economic competitiveness and creation of jobs, durable and sustainable development of the South-East Region, internationalization of members, professional development of managers and employees, administration of a common database, participation in national and European networks, increasing the innovation potential of enterprises in the following sectors: bio-economy and bio-agriculture; Pisciculture; Tourism; Logistics & transportation; Protection and conservation of the environment; Renewable energy; Creative and cultural sectors; Social Innovation.

The services offered by this cluster targets the following areas: access to foreign markets, identification of business opportunities, participating in international promotional events, branding and marketing, technology transfer, drafting of European projects, creation of consortium and participation in research projects, training, counseling and qualification of labor force.

Among the members of the association are Manor Laboratory Center, LTA Mondial, AGRICHIM, Danube Delta Biosphere Reservation Tulcea, Bio Romania Association, INCDD Tulcea and Spiru Haret University.

11. “Danube Delta” Cluster (ODAS)

The Danube Delta cluster was founded at the end of 2015 by the ODAS association, as managing authority, and the companies SC M.D.A. SRL and SC ECHINOX SRL, who operate in the Danube Delta region and have an extensive experience in promoting the natural riches of flora and fauna. Currently, the cluster has 16 members.

The main activities of the cluster are:

- Promoting the Biosphere of Danube Delta Reservation;
- Promoting and building private-public partnerships in the field of tourism;
- Harmonizing the interests of the members;
- Elaborating and/or implementing projects with the purpose of developing the cluster and accomplish the progress of competent entities within the cluster;

ODAS offers the following support services:

- Identifying business partners - providers, clients, collaborators etc;
- Identifying consultancy experts and specialists in the field of the company's operations;
- Signing of strong and long-term partnerships, profitable for both sides;
- Access to a high level of labor force within the field of the company's operations;
- Networking and cooperation with similar structures from Europe.

12. “Touristic Carpathian” Cluster

Founded in 2010, the “Touristic Carpathian” Cluster from Buzau has the mission to promote sustainable tourism and to create added value for the tourism industry in the Carpathian Mountains region. It was founded under the initiative of the Association for Promoting and Developing of Tourism in the county of Brasov (APDT Brasov) together with Monteoru Renaissance - Association for durable regional development of tourism (Buzau county). “Carpathian Tourism Cluster Romania” is a network of managers and experts from the tourism industry, organized at regional and national level, being the first inter-regional tourism cluster of national interest in Romania.

The objectives of the Cluster are innovation and diversification - meaning the development of tourism products and their associated services, their modernization and innovation, in order to increase the interest of the external and internal markets for the

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Carpathian Mountains as a tourist destination. Also, the most important activities are increasing competitiveness by optimizing the value chain in the local tourism industry and improving the quality of tourism services to meet the European standards. The cluster is integrated into an international tourism network and aims, in particular, to promote the Carpathian Mountains as a tourist destination for domestic and foreign tourists.

The services offered by the cluster are:

- Networking: Regularly organizing meetings with the decision makers from the tourism sector, at regional and national level;
- Organizing thematic working groups (new touristic services, quality management, tourism advertising, etc.);
- Promoting the Carpathian Mountains as an “excellent tourism destination”;
- Innovation & Competitiveness: Developing innovative touristic projects at regional and national level (e.g. events of regional/national interest);
- Trainings for developing the value chain of regional tourism (providers-agents-service providers);
- Improving the absorption of structural funds for tourism projects;
- Participating to fairs, road shows;
- International cooperation/ international benchmarking that includes excellent touristic destinations;
- Lobbying: Consultative role for public authorities (Ministry of Tourism, Regional Administration, etc.)

The business incubators for South-East Region

The business incubators are structures designed to support business development at the beginning of the business. The selected companies are housed in a Business Incubator for a fixed amount of time (the incubation cycle), a period in which they receive financial support, consulting services and office space. Along with the logistical support needed to start the business, the incubator provides a proper environment for business development, facilitating networking activities, transferring know-how, and providing support in developing partnerships (Incubat - Business and Technological Incubators Project).

The business incubator Mangalia is part of the “National Multianual Programme during the 2002-2012 period for Founding and Developing Technological and Business Incubators”, coordinated by the SME Project and Programme Implementation Agency and it was implemented by the Development United Nations Programme (DUNP), in collaboration with local authorities of targeted areas.

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The Mangalia incubator was inaugurated in October 2010 with the objective of supporting the development of new founded SMEs from the region. According to the website of the incubator, the companies incubated in the programme are the following:

BEST QUALITY SOLUTIONS - Domain: Food industry, Event organization

BEST TRAINING & CONSULTING - Domain: Consultancy, Various services

BEST WEDDINGS AND EVENTS - Domain: Event management

BROTHERS METAL - Domain: Construction

CLEVER MEDICAL SOLUTIONS - Domain: Consulting, Production / Engineering, Various Services

CUIR BUSINESS - Domain: Consultancy

DANELICONS TOP - Domain: Construction

ELEROX CONSIND - Domain: Construction

FINANCIAL ACCOUNTING SOLUTIONS - Domain: Consultancy

G & G ENTERTAINMENT CAFE - Domain: Food industry, Event organization

JEEFO ENTERPRISE - Domain: Consultancy, IT

LAST BUG - Domain: Various services

NEW BALCAN - Domain: Consultancy, Various services

NEW WAVE WEB DEVELOPMENT - Domain: Web technology, Consultancy

NORRIS ADVERTISING - Domain: Printing, Advertising

RADYGEO TOUR - Domain: Consultancy, Auto

SAAR SURFACES - Domain: Production / Engineering

SEASIDE NEW MEDIA SOLUTIONS - Domain: IT, Various Services

TECHNO DIGITAL 4 YOU - Domain: Printing

TRENDY SMILE - Domain: Crafts

WISE DEFENDERS - Domain: Security services

BEST QUALITY SOLUTIONS - Domain: Food industry, Event organization.

SME Patronate - First business incubator from Constanta (not authorised). Since 2004, the SME Patronate Constanta is a business incubator. Together with the implementation of RETE CLAS Project in Constanta, the CLAS Center was founded, as well as the first company through a Phare project, which has received a 3.000 euro award.

Besides the logistic support required for the start of the activities, the incubator offers a proper environment for developing businesses, the companies receiving support for development during the first years of activity.

The activities of the business incubator are:

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- consultancy and assistance both for starting a business and for increasing the development potential of small and medium enterprises with ongoing activity;
- elaborating business plans;
- consultancy and juridical assistance for founding a new company;
- consultancy and assistance in the financial-accountancy field, human resources, quality management, marketing and sales;
- consultancy regarding financing sources, elaborating the documentation for non-reimbursable/ reimbursable financing programmes.

Industrial parks in the South-East Region

In the South-East region, there are two industrial parks and one software park.

1. Industrial Park Galați

The Industrial Park Galati is managed by Industrial Park SRL. It has a total area of 21.8 hectares and is located on the Danube shore in the southeastern part of Galati.

The purpose of the Industrial Park is to support the local and regional economy, to develop it horizontally and to create jobs for the highly qualified workforce offered by the graduates of the Galati universities, as well as for the qualified ones.

The Industrial Park is a delimited area where economic activities, research, industrial production and services are carried out with the purpose of developing and capitalizing on the natural and human resources of the area. The resident of the park can be any economic operator, Romanian and / or foreign legal person, NGOs, research institutions and other units that do not have legal personality and operate according to the law and carry out economic activities, of scientific research, of capitalizing on scientific research and / or technological development, agro-industrial, logistic and innovative, industrial, etc., within the industrial park, based on the management contract and related services concluded with the park manager.

The infrastructure of the industrial park is composed of:

- Administrative headquarters of 1463 sm
- Deposit, aproximately 1100 sm
- Utilities: water, waste water treatment plant, electricity.

The advantages of the Industrial Park Galati are given by the strategic location in the

immediate nearby of the Galati Free Zone, at the border with Ukraine and the Republic of Moldova, with access to the Danube, 80 km from the Black Sea. It has access to the major river transports (Rin - Main - Danube Canal), Russian - European railway transport (including broad - gauge) and road on the national road DN 2B; It has access to the docks so that the companies within it can benefit from port services: loading / unloading of a variety of goods; stacking / mooring of goods on any means of transport; storage on specific platforms and / or in warehouses.

The Industrial Park can be beneficial to supporting the infrastructure for businesses with the following types of services and activities:

- One-Stop-Shop, with services for entrepreneurs and - company founding, juridical consultancy, fiscal consultancy;
- Non-reimbursable and reimbursable financing of SMEs - assistance and consultancy;
- Cooperation and work space for small-entrepreneurs, innovators, researchers - promoting the co-working system;
- Professional training through the development of open training programs and raising funds for such programs;
- Global connection through the development of an international cooperation network, Galati will be positioned as a competitive destination and will be connected to the European business trends.

2. Industrial Park Mangalia

The Industrial Park Mangalia is under the administration of “*SC Administrarea Parcului Industrial Mangalia SRL*” (*Administration of the Industrial Park*). It has a surface of 13.1 ha and is placed at a distance of 1.5 km from the west of Mangalia town. The terrain is under the propriety of Mangalia Municipality. The park has access to the county road DJ 391, Mangalia Negru-Voda, but also to the European road E 85 (DN 39) Constanta - Mangalia. Moreover, it has access to the railway and the port of Mangalia. The proximity to the border with Bulgaria creates opportunities for the development of import-export activities and cross-border cooperation.

The main advantages that it offers to the economic agents are:

- access by road, railroad and water/naval;
- survey and protection for buildings and goods;
- advantageous rental rates for buildings and land during the first years of operation;
- the existence of buildings and warehouses that can be rehabilitated with low financial resources;

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- internal paved and concrete access roads to all buildings;
- infrastructure and utilities for the work zone;
- vacant land on which construction can be done according to the applicants' projects;
- qualified labor in Mangalia area and neighboring localities;
- the proximity of the two large shipyards creates special opportunities for horizontal subcontracting for the production of parts and subassemblies for the shipping industry;
- the administrative company of the industrial park will provide advice to investors throughout the investment period and for the running of production capacities. The consultancy will cover various aspects: legislation, obtaining opinions and agreements for achieving the objectives, construction design solutions, marketing, relations with suppliers and distribution networks, etc.
- location in an economically growing area.

3. Software Park Galati

The Software Park Galați is an initiative of the consortium consisting of Galati County Council, Galati Local Council, University "Dunarea de Jos" (Low Danube) of Galati and S.C. Navrom - Business Center SA Galati. The consortium has designated the administrative responsibility to the Cons Management Park SOFT PARK S.R.L., a company that has as partners the County Council and the Local Council Galati.

The Science and Technology Park of Galati aims to contribute to the development of high-tech industrial sector, facilitating the transfer of technology and creating a viable alternative to the labor market in the South-East Region. The Software Park offers for use 64 offices with 12, 22, 42 or 70 sqm areas, a conference room with a capacity of 70 seats, a multimedia room, a training room, a protocol room, a server room as well as space for consulting and research.

Currently, a number of 40 companies are operating within the park, with a workforce of approximately 300 people, but the process of creating work force continues to reach 500 people.

The specialized services offered by the park are:

- business support services for innovation and technology transfer;
- research and development services;
- technological information services, technological audit, technological forecast and prognosis;

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- assistance and consultancy services for the development of experimental models and prototypes;
- assistance and advisory services for the exploitation of intellectual property rights;
- assistance and advisory services in the legislative field at national, European and international level;
- raising funds within national and international programmes;
- identifying partners from the university and research field;
- ensuring access to specialized databases;
- information regarding national, regional and local priorities.

In addition to these specialized services, the park offers marketing facilities, technical documentation facilities, communication facilities, collaboration with the universities, facilities for conferences and trainings, as well as financial, accounting, tax and legal assistance.

Intellectual property rights in the South-East Region

The degree of innovation of a country or region is also revealed by the number of patents, the applications for registration of designs and the number of trademark applications.

According to OSIM, the patent grants the holder the right to prohibit third parties from performing without their authorization the following acts:

- for products: production, commercialization, selling, usage, import/ export for commercialization, selling or usage;
- for processes or methods: their usage.

The patent is valid for 20 years and starts from the date of the constitution of the national regulatory deposit. The right to the patent belongs to the inventor or his successor in title; in the case of employed inventors, the patent right belongs either to the inventor or to the company, in accordance with the law or the agreement between the parties. Patentability conditions are in line with current international regulations. Patent applications shall be published after 18 months from the date of the regular national filing, or the priority invoked. Published patent applications benefit from provisional protection until the patent is granted (OSIM, 2017).

The brand is an essential element of the enterprise's strategy, it distinguishes the products and services of the enterprise from those of the competition. For the consumer, it is the most convenient means to quickly recognize a category of products and services

that have been recommended to him, or based on personal experience which have led him to prefer other products or services of the same nature. For the enterprise, the brand is a means of conquering and retaining a clientele. A trademark may be opposed to another trademark used by the competition, only after the OSIM registration (OSIM, 2017).

A new or aesthetic appearance of a product in two or three dimensions, having an individual character, can be registered as a design or model. Through design it is understood the motives (two- dimensions shapes) presented on the fabrics, paper, porcelain, etc. The model means a three-dimensional shape, for example: electrical equipment, furniture, footwear, etc.

The following can be protected as designs or models: food products, clothing, travel goods, boxes, umbrellas and personal belongings, brushes, uncoated textile articles, synthetic or natural fibers, furniture, household articles; domestic metal machinery and equipment; packages and containers for the preservation of goods, watches and clocks or other measuring objects; control and signaling tools; ornamental objects; means of transport and lifting; devices for producing, distributing and transforming electricity; recording, telecommunication and information processing machines; photographic, cinematographic or optical articles; musical instruments; printing and stationery articles; office machines, materials for arts, education; sales and advertising equipment, illuminated signs and indicators; games, toys, tents and sporting articles; weapons, pyrotechnic articles, hunting, fishing and destruction of harmful animals articles; installations for the distribution of fluids, sanitary, heating, ventilation and air conditioning installations, solid fuels; materials and devices for medicine and laboratories; construction and building elements; lighting devices; tobacco and articles for smokers; pharmaceutical and cosmetic products and articles, toilet articles and tools; devices and equipment for fire prevention and extinguishing; to prevent accidents; animal care products, various food and beverage machines and appliances.

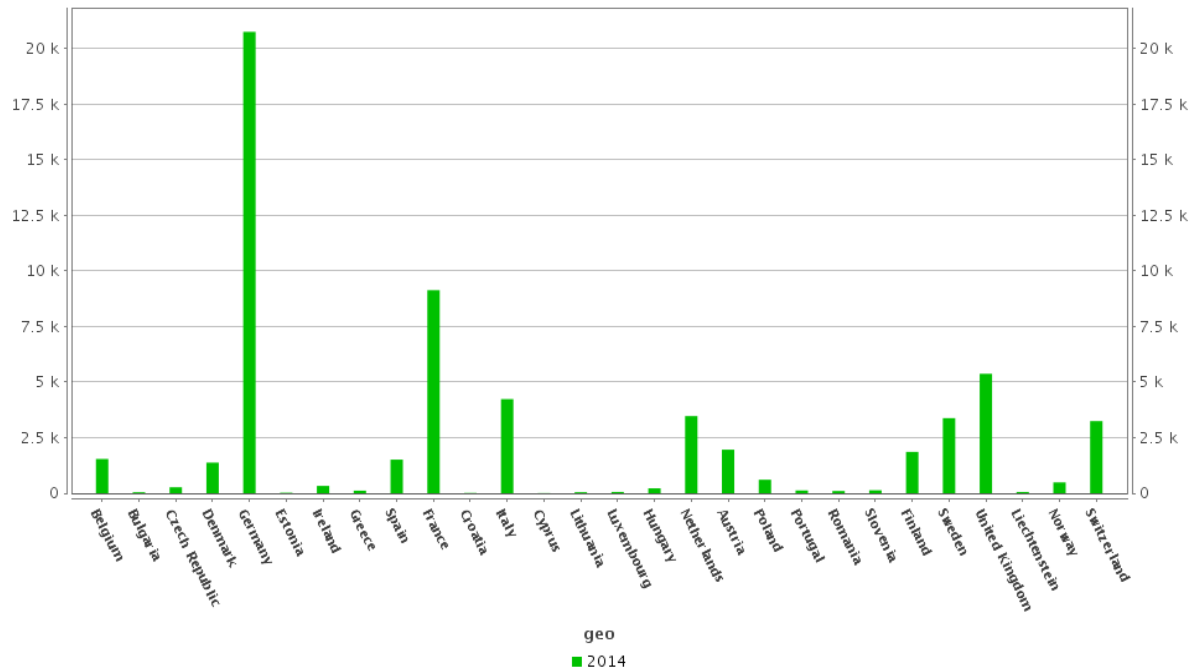
The rights of the holder derived from the design registration certificate are: the exclusive exploitation right; the right to prohibit third parties from carrying out without its authorization the following acts: reproduction, manufacture, marketing or offering for sale, use of the import or storage for the purpose of marketing, offering for sale or using the design of the product in which it is incorporated (OSIM 2017).

In the European Union, in 2014 there were 56,752 patent applications. The country with the most requests was Germany, and the country with the fewest requests was Cyprus (8 applications). In Romania, the number of applications registered by EPO has continuously increased between 2010 and 2014, from 34 to 101.

Figure no. 130 Number of patent applications in the EU, 2014

Patent applications to the European patent office (EPO) by priority year

Number

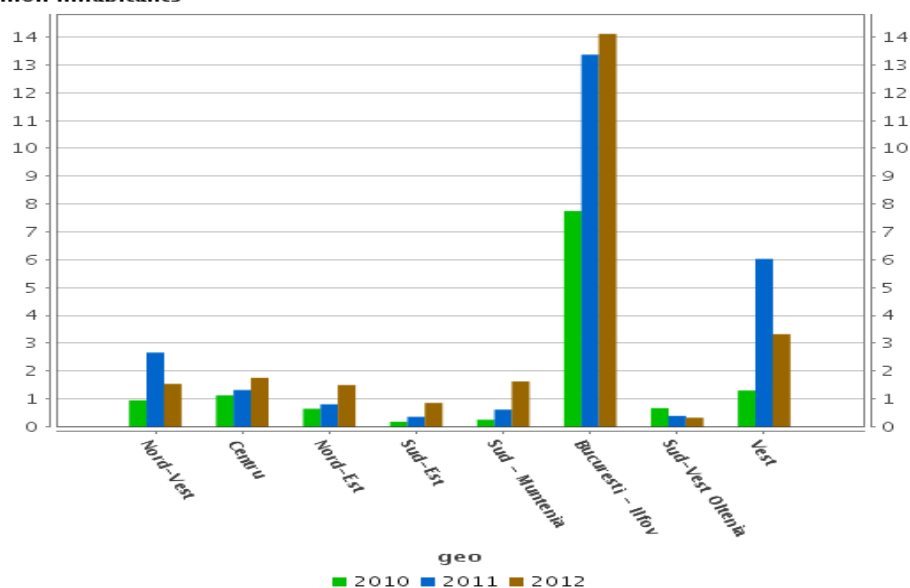


Source: Eurostat, 2017

At territorial level, the number of applications registered by the EPO registered an upward trend between 2010 - 2012. Most of the applications were in the Bucharest-Ilfov Region (14.115 per million inhabitants). In the South-East Region, 0,855 patent applications per million inhabitants were registered.

Figure no. 131 Number of patent applications in Romania, per regions, 2010-2012

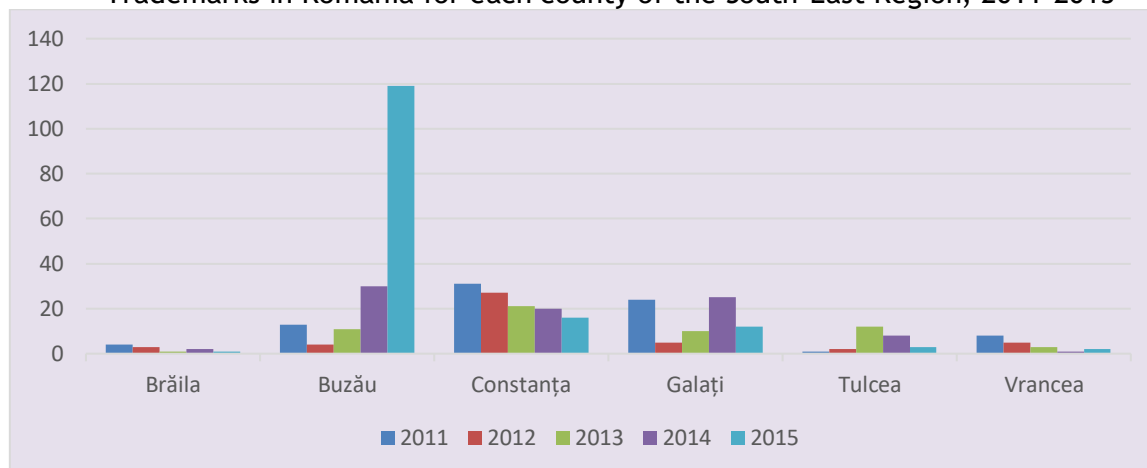
Per million inhabitants



Source: Eurostat, 2017

With regards to the number of patent applications of Romanian applicants at the State Office for Inventions and Trademarks in Romania, a total of 980 applications were submitted in 2015. Of these, only 15,6% were registered in the South-East Region, most of them in Buzău County.

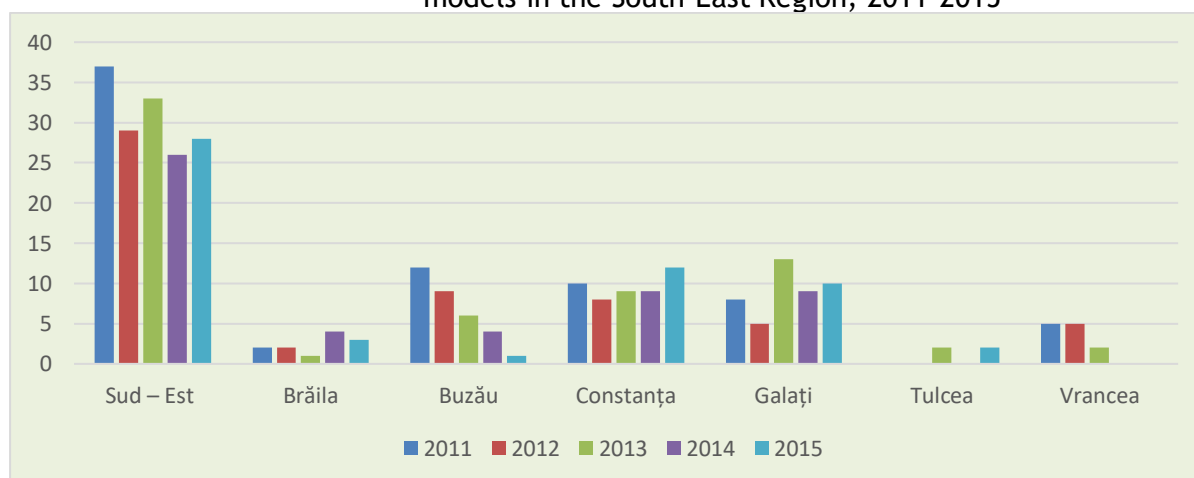
Figure no. 132 Number of patent applications at the State Office for Inventions and Trademarks in Romania for each county of the South-East Region, 2011-2015



Source: SOIT, 2017

During the analysis period 2011-2015, the number of applications for the registration of designs/models of Romanian applicants had slightly fluctuations. In 2015 there were 285 such requests at national level. At regional level, it is noted that most of the applications are submitted in Bucharest-Ilfov Region. In the South-East Region only 28 applications for registration of the designs/ models were submitted, while Constanta County registered the highest number of applications (12).

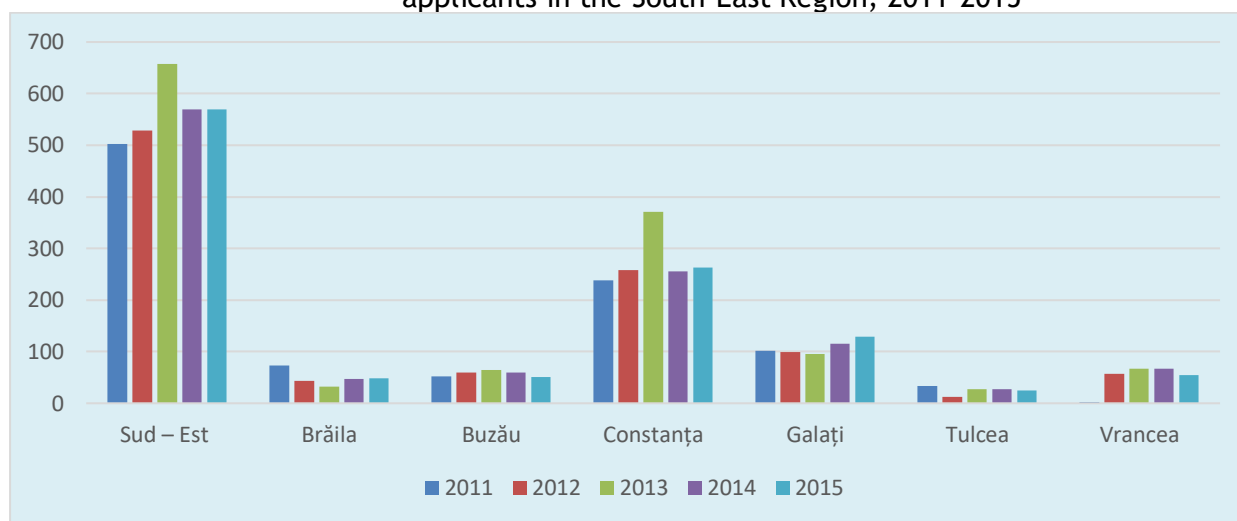
Figure no. 133 Number of applications for the registration of the designs/ models in the South-East Region, 2011-2015



Source: SOIT, 2017

In Romania, during 2015, there were registered a number of 8067 trademark applications. Out of those, only 7% were registered in the South East Region in 2015. Analyzing the situation of the counties, it is noticed that Constanța County received the most of the 263 registered trademark applications. In Tulcea County, there were only 25 applications in 2015. The evolution and number of applications per county can be seen in the following figure.

Figure no. 134 Number of requests for trademark registration of Romanian applicants in the South-East Region, 2011-2015



Source: SOIT

Industrial agglomeration

Industrial agglomerations are geographical concentrations of companies and institutions operating in a particular field. They include a number of related institutions and other entities which have an important role in terms of competition (clients, specialized suppliers, service providers, related companies and related institutions). These competitive agglomerations are explained by Porter⁹ as a new way of organizing a value chain or a new organizational spatial form, significantly different from the traditional integration of companies on the market.

On the national economical scale, a standard methodology used in EU practice across all Member States was pursued. Industrial clusters / agglomerations are ranked on an evaluation scale from 0 (minimum) to 3 (maximum) stars.

Analysis factors:

⁹ Porter, Michael E. ["Competitive Advantage, Agglomeration Economies, and Regional Policy."](#) *International Regional Science Review* 19, nos. 1-2 (1996).

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- Scale/Size (Scale Index = S):

$$S = \frac{\text{No of employees from the analyzed industrial agglomeration}}{\text{No.of total employees in Romania operating in the activity sector of the analyzed industrial agglomeration}} \times 100$$

If $S > 10\%$, then the analyzed agglomeration gains 1 star. The agglomerations that have a number of employees lower than 1000 gain 0 stars.

- Specialization (Specialization index = s):

$$S = \frac{\frac{\text{No of employees from the analyzed industrial agglomeration}}{\text{No of total employees in the region}}}{\frac{\text{No.of total employees in Romania operating in the activity sector of the analyzed industrial agglomeration}}{\text{No of total employees in Romania}}} \times 100$$

If $s \geq 2$, then the agglomeration gains 1 star.

- Concentration (Concentration index = C):

$$C = \frac{\text{No of employees from the analyzed industrial agglomeration}}{\text{No of total employees from the region}} \times 100$$

If $C > 10\%$, then the agglomeration gains 1 star.

- Performance indicators:

Evaluation practices have established the following performance indicators:

Innovation indicator = I

For quantification, it was utilized a combination among the classification by type of technology, used for calculating the *Potential Competitiveness Index*, and the Regional Innovation Indicator (NUTS2) from which the selected industries are part:

$I > 70$, then I = High level;

$I = [30...70]$, then I = Medium level; $I < 30$, then I = Low level.

Export indicator = E:

$$E = \frac{\frac{\text{Total export value of the region regarding the activity sector of the analyzed agglomeration}}{\text{Total export value of the region}}}{\frac{\text{Total export value of Romania regarding the activity sector of the analyzed agglomeration}}{\text{Total export value of Romania}}} \times 100$$

$E > 2$, then the export capacity of the agglomeration is Strong;

$E = [1...2]$, then the export capacity of the agglomeration is Medium;

$E < 1$, then the export capacity is Weak.

Enright's¹⁰ research (2001) suggests multiple dimensions of agglomeration analysis. These include the territorial extent, economic density, the breadth and depth of the agglomeration, the sales area, the stage of development, the technological nature of the activities, the nature of the competitive activities, the innovative capacity.

At national level, the Ministry of Economics is monitoring 40 structures and clusters.

Association Traditions - Manufacturing - Future TMV South-East Cluster, founded in 2010, having 15 members and 12.0000 employees in 2010. There were 3 enterprises that have introduced process innovation and 2 others that have introduced product innovation, without a certificate.

The purpose of the association is to promote and defend the interests of commercial enterprises that are operating in the industry of textiles, leather goods, knitwear, materials suppliers, services by actions that contribute to long-term development.

The most important objectives of the association are:

- increasing the competitiveness of the textiles industry of the South-East Region;
- stabilization and development of work force in this field;
- attracting new enterprises in the region;
- creating a regional brand;
- participation in coordinating structures of programmes together with EU.

The members of the structure are SC SORSTE SA, SC ARTIFEX SA and SC TEXTILE BLUE WASH SRL.

“Maritim Românesc” Cluster, founded in 2011, is located in Constanța, at the Nautic Base UM. The cluster has 42 members (22 enterprises, 3 universities and 1 research institute) and encompasses 40.000 employees, according to the reports of 2011. The main markets covered by the cluster are the nautical and maritime markets. The cluster, also, has a partnership with the Romanian Cluster Association.

Their main objectives are the following:

- promoting policies oriented towards the maritime industry;
- supporting SMEs and their productivity;
- establishing contracts with other maritime clusters.

¹⁰ Michael J. Enright, “Regional Clustering: What we know and what we should know,” Kiel Workshop, Innovation Clusters and Interregional Competition, November 2001.

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Tourism “Carpathic Cluster” (Association Renaissance Cluster) is a non-profit governmental association set up in 2010 to preserve historical heritage and promote regional sustainable development in tourism, especially in the Prahova area and Subcarpathian areas of Buzau. Association for Tourism Development and Promotion from Brasov county, Cross Mondo and MCG Servconstruct SRL are the national organizations with which the cluster is in a partnership relationship.

Their main projects are:

- promoting touristic and cultural traditions of the region;
- developing thematic touristic routes.

MEDGreen Cluster (Cluster for promoting businesses specialized in eco-technologies and alternative energy sources), with the headquarters in Medgidia, was founded in march 2013, having 6 members and 189 employees.

The objectives of the association are the following:

- development in the field of research, education, production, commerce;
- promoting practices in the field of eco-technologies and alternative energy sources;
- creating a common base, encouraging cooperation and facilitating the access to information.

The industrial activities are concentrated mainly in urban centers, especially large ones, and are hardly present in rural areas. The first 5 sub-sectors of industrial production in South-East show that the predominant industries are the traditional (food industry 12,45% and furniture industry 7,5%) and heavy mechanics (metal and metal products). The shipbuilding industry is specific to its region, being an incipient cluster, gaining advantage from the positioning of the shipyards in Braila, Galati, Mangalia, Tulcea, Constanta.

The food industry is present in almost all cities, while a large share of companies is concentrated in the industrial sectors of metal construction and metal products.

The following concentrations are highlighted by the analysis of the location of industrial operators in the territory:

- Petrochemical industry - Năvodari Plant;
- Metallurgic industry - Galați and Tulcea;
- Vehicle constructing industry - Brăila, Buzău, Constanța, Tecuci;
- Naval constructions and maritime drilling platform industries - Galați, Constanța, Brăila, Tulcea, Mangalia;

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- Industry for construction materials - Medgidia;
- Clothing manufacturing industry - Brăila, Buzău, Focșani;
- Lumber industry - Vrancea, Buzău.

Due to the economic crisis, the number of industrial workers declined significantly in 2008-2010, but slightly increased in 2011.

The share of employees in the industrial sector is 19,26% of the total number of employees in all regional sectors (it is above the national average of 18,3).

The industrial activity is concentrated in all the counties of the region. This activity concentrates in Constanta 32% of the active units in the field, 18% in Buzau, 17% in Galati, 11% in Braila, 14% in Vrancea and 8% in Tulcea.

By analyzing the data at county level, the following differences and characteristics are highlighted:

In **Vrancea**, the clothing manufacturing industry is the dominant one (almost 50% of the total production and almost 50% of the total human resources employed), followed by the food industry (almost 20% of the total industry and 40% of the total human resources). Other sectors are wood processing, metal and metal products industries, being added also the construction sector with 11% of the companies from this field.

In **Tulcea** County, the food industry comprises more than 20% of the economic agents in this sector. Other representative industrial sectors are the ship-repairs and shipbuilding industries, the woodworking industry, the light material industry, the food industry.

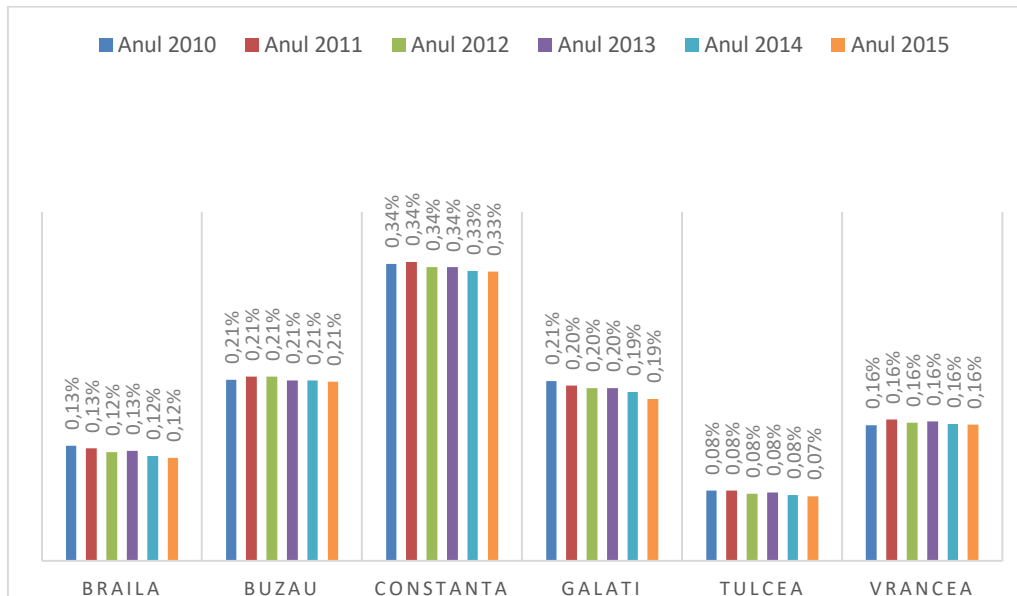
Galati County is the country's 4th largest industrial center. The mechanical sector is the most developed here, with companies focusing on the metal construction and metal products industries, naval manufacturing, machinery and equipment.

In **Constanta** County, the industrial activities are oriented towards the mechanical and chemical sector. The leading sector is the production of ships and means of water transport, concentrating 12,21% of the county's companies. Other important sectors are the metal industry, rubber and plastics processing, and machinery and equipment manufacturing. The food industry is the sector that includes about 15% of the companies in the field.

In **Buzau** county, the traditional industrial activities (food industry and furniture production) encompass a large number of firms.

The food sector is the predominant sector in **Braila** county, holding almost 20% of the companies in the field. The production of clothing, the metal construction industry, the production of electricity and furniture are also developed areas in this county.

Figure no. 135 Ratio evolution of active units for the extractive and processing industry in total active units of the South-East Region, 2010-2015 period



Sources: author's calculations

It can be noticed that the largest share is in Constanta County, while the lowest is in Tulcea county.

However, in each county there is a generally decreasing trend along the analyzed time horizon.

Competitive potential index:

General aspects:

- There is no unanimously accepted definition of a unitary concept regarding the competitiveness.
- The literature review highlights very different points of view in defining, measuring, and understanding the competitiveness that emerges as a concept with multiple approaches.
- Competitiveness becomes (Podkaminer, 2002)¹¹ a dominant factor in supporting the economic growth and reducing gaps in the context of convergence processes.
- Competitiveness has a relative dimension rather than an absolute one.

¹¹ <http://mone.acad.ro/wp-content/uploads/2014/08/Competitivitate-Performanta-Sustenabilitate.pdf>

- The hierarchical system of socio-economic competitiveness of a country makes a clear distinction between components and factors of competitiveness, the economic competitiveness being only a part of this, although very important. The ultimate goal is the well-being of a nation, and the degree of achieving it is the best measure of competitiveness in relation to other countries.

Definitions:

- "Competitiveness is the ability of a country to achieve a high, sustainable rate of gross domestic product per capita." ¹²
- "Competitiveness is the degree to which in a free market a nation can produce goods and services that can pass the test of international competition and at the same time can maintain and increase the real domestic income." ¹³
- "Competitiveness is the ability to produce goods and services that pass the test of the international market, while maintaining high and sustainable levels of income, or, more generally, the ability of regions to generate, when exposed to foreign competition, relatively high levels of income and employment" ¹⁴

Opinions regarding the measurement of competitiveness:

- Many competitiveness analysts focus their studies on structural factors that affect long-term performance and tend to focus on productivity, innovation and qualification (Fagerberg, 1996¹⁵).
- Criteria to be satisfied by the indicators, according to M. Duran and Giorno (2005, p.149-150¹⁶): - to cover all sectors exposed to competition; - encompass all markets open to competition; - be built on data that is fully internationally comparable.

Characteristics of competitiveness indicators:

- Indicators that measure competitiveness are over 200, of which 95 are characterized as main indicators indicators - key indicators - as shown by the 2001 Annual Competitiveness Report;
- 11 attributes considered: - economic performance, - degree of internationalization, - capital (level and structure), - level of education, - productivity, - labor compensation and unit labor cost; - the cost of non-profit enterprises; - taxes, - science and

¹² World Economic Forum

¹³ OECD, 1992, p.237

¹⁴ Global Competition: The New Reality. Report on the President's Commission on Industrial Competitiveness, 1985) and of the European Commission (1999)

¹⁵ Fagerberg, Jan, (1996), Technology and Competitiveness, No 1996548, Working Papers Archives, Centre for Technology, Innovation and Culture, University of Oslo, <http://EconPapers.repec.org/RePEc:tik:wparch:1996548>.

¹⁶ <http://mone.acad.ro/wp-content/uploads/2014/08/Competitivitate-Performanta-Sustenabilitate.pdf>

technology, - computerization of society, transport and infrastructure - environmental protection and management.

Calculation method:

The CPI is a composite index calculated by aggregating simple derived indicators (GDP / capita, Exports / employed population) and a compound indicator (Technological Development Index), which is calculated closely as the Regional Competitiveness Index (RCI). It is a combination of a large set of indicators that are observed, statistically weighed, and ultimately aggregated. RCI is therefore the result of a long list of subjective choices.

Two interconnected principles are pursued: simplicity and transparency. Simplicity is driven by the general need of the composite to be easily understood by a non-technical public - political decision-makers, stakeholders and citizens.

Structuring a composite is a multidisciplinary exercise involving expertise both in the concept to be measured and also in the statistical techniques used to evaluate the development methodology. The initial step in establishing a composite indicator is to define it as a concept and index framework (OECD, 2008). In the following, the focus is placed on the most important steps taken during the construction of the RCI. All the details are provided in Annoni and Kozovska¹⁷.

The statistical evaluation of the RCI is done in two phases:

1. to evaluate the quality of each selected indicator - This includes the lack of values and exceptional values (univariate analysis);
2. to check if the set of indicators within each dimension is consistent (multivariate analysis). Univariate analysis is elaborated separately for each indicator.

RCI elaboration consists of:

The first step consists of calculating the scores for each RCI dimension as an arithmetic mean of those transformed and normalized.

The second step is to calculate the scores for the three dimensional groups - base, efficiency and innovation - as arithmetic means of the dimensional scores. For each region the sub-scores associated with the dimensional groups are:

¹⁷ EU Regional Competitiveness Index 2010 Author(s): Paola Annoni and Kornelia Kozovska Luxembourg: Publications Office of the European Union 2010 –274p. – 21 x 29.70 cm EUR – Scientific and Technical Research series – ISSN 1018-5593 ISBN 978-92-79-15693-9 DOI 10.2788/88040

$$RCI_{basic}(i) = \frac{1}{5} \sum_{j=1}^5 score(i, j)$$

$$RCI_{efficiency}(i) = \frac{1}{3} \sum_{j=6}^8 score(i, j)$$

$$RCI_{innovation}(i) = \frac{1}{3} \sum_{j=9}^{11} score(i, j)$$

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In the last phase, the RCI score is calculated as a weighted average of the three sub-scores:

$$RCI(i) = w_{basic} RCI_{basic}(i) + w_{efficiency} RCI_{efficiency}(i) +$$

$$w_{innovation} RCI_{innovation}(i)$$

$$w_{basic} + w_{efficiency} + w_{innovation} = 1$$

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Territorial dimension of competitiveness

Taking into account the European-wide trends in the analysis of the territorial component of competitiveness, the European Commission proposed in 2011 the calculation of the Regional Competitiveness Index (RCI). The methodology of calculation starts from the premise that in a spatial context, the economic competitiveness is determined by a complex system of factors, which, among others, are focusing on: creative and innovative capitalization of the regional potential; creation of connections at territorial level through stimulating the appearance and consolidation of intra and inter-industrial connections of value chains, capitalization on natural and cultural patrimony, utilization of research-innovation potential and improving connectivity and accessibility.

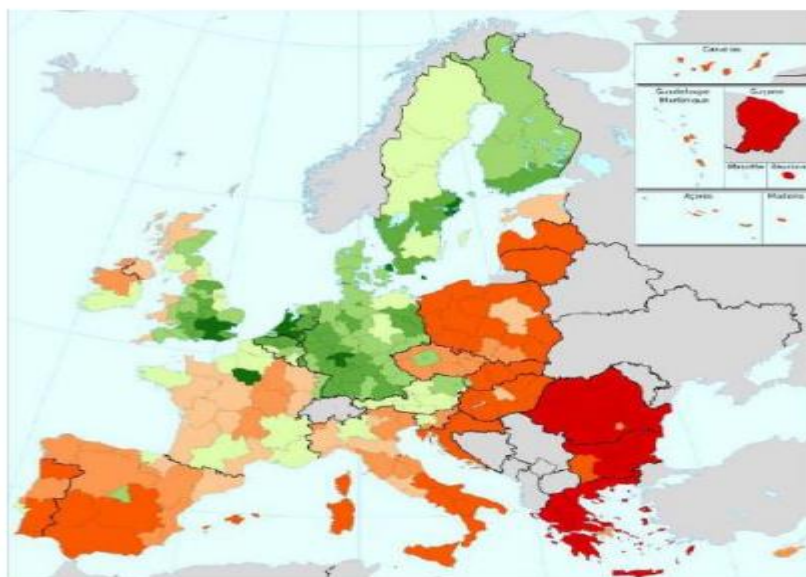
Based on the RCI, whose computation formula closely follows the Global Competitiveness Index, the Regional Competitiveness Map (next figure) has been developed at EU level. As can be seen from the graphical illustration, among the countries of the European Union, Romania's development regions are on the last place both in terms of the RCI and in almost all the rankings of indicators composing this index. The capital region has the highest values in terms of competitiveness, but the positive effects on neighboring regions are limited.

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Specifically, j = 1 indicates the dimension Institutions, j = 2 indicates the dimension Macroeconomic stability, ..., j = 11 indicates the dimension Innovation.

¹⁹ http://ec.europa.eu/regional_policy/sources/docgener/work/2011_02_competitiveness.pdf

Figure no. 136 Regional Competitiveness Map at EU level



Source: P. Annoni and L. Dijkstra (2013), „EU Regional Competitiveness Index - RCI 2013”, Unit of Econometrics and Applied Statistics, DG JRC Ispra; Economic Analysis Unit, DG Region, Brussels

Explanatory note: The index values are represented by color shades from dark green for high values to dark red for low values.

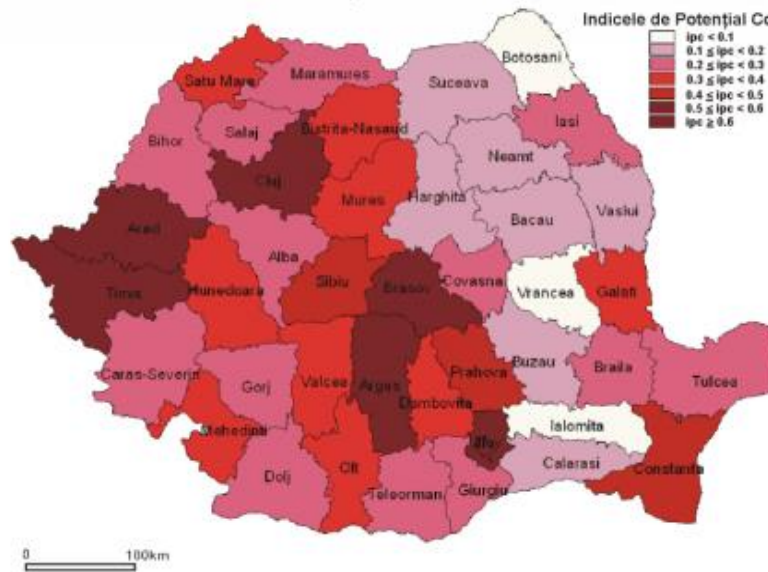
Under these circumstances, in the case of Romania, the cohesion policy must contribute not only to reducing regional disparities but also to achieving Romania's competitiveness objectives. The results of the Competitive Potential Index (CPI)²⁰ at NUTS 3 territorial level (county level) help us to clarify more clearly some economic aspects related to the diagnosis and the measurement of the economic performance of a territory. The following figure graphically shows the values obtained. The visual analysis of the distribution of these values leads to at least two findings:

- An axis of the counties with high values of the Competitive Potential Index, which crosses almost diagonally the country and overlaps with the most complete infrastructure in Romania (European roads, national roads, railways, airports).
- A mosaic aspect of the distribution of this index that overlaps the western, central and southern parts. The East of the country is characterized by a homogeneous distribution of values, which translates into the landscape of economic performance through an inability to judiciously capitalize the natural and anthropic capital (low

²⁰ The CPI is a composite index calculated by aggregating simple derived indicators (GDP / inhabitants, exports / employed population) and a composite indicator (Technological Development Index). Source: Valentin Cojanu (Coordinator), Competitive potential of the economic growth : Guidelines for a New Industrial Policy in Romania, Strategic Studies and Policies SPOS 2010, European Institute of Romania, Bucharest, October 2010

technology transfer, reduced capital, limitations in the polarization area of Moldovan cities)²¹.

Figure no. 137 Spatial distribution of the competitive potential index



Map processed by Dr. Robert Dobre, made by using thematic maps and georeferencing, digitization and processing in GIS Open Source programs (Map Analyst).

Source: National Competitiveness Strategy June 2014

At the level of the local economy, according to the hierarchy of CPI values, Argeş County ranks first with an index value of 0,78, compared to a country average of 0,31, reflecting a large volume of total exports (the second at national level), the highest ratio between exports and employed population (10.925 euro / employee) and the highest share of medium-high technology exports (20,3% of the total per country and 24% of the total per county).

On the second place, with a value of 0,68, is Bucharest, having the highest export values, but also the largest occupied population. Timiş county ranks 3rd, with the highest exports of high technology. No county in the North-East Region is ranked among the top 20, as competitive potential. Bacau, ranked fourth in terms of high technology exports, is only ranked 34th out of 42, due to the high share of low technology exports in the total of the county (almost 70%) and of the low exports /occupied population, of only 1.099 euros. **Only two counties in the South-East Region - Constanta and Galati - exceed the national average in terms of the value of the competitive potential index, having as main branches shipbuilding and ferrous metallurgy.** The situation is similar also for most

²¹ National Competitiveness Strategy June 2014

of the other regions, each with two or three counties with values above the national average. The limited effects of training in the territory, both spatially (from county to county) and sectoral (from industry to industry), can be understood, on the one hand, by the insufficient development of links between different economic activities.

Romania's trade surplus is highly dependent on the development of the auto industry in Argeş, and the Bucharest-Ilfov Region contributes more by import demand than by the surplus of external sales. The competitive advantages, measured by the export participation, are concentrated in seven counties, located mainly in the west and the center of the country (Argeş 10%, Timiş 9%, Arad 5%, Constanţa 5%, Bihor 4%, Brasov 4%, Sibiu 4 %), which together with Bucharest (17%) accounts for 60% of Romania's exports. The Calarasi, Ialomită, Mehedinţi, Neamţ, Olt, Tulcea and Vrancea counties do not have high technology exports, and 29 counties out of a total of 42 do not exceed the threshold of 1% of the total by country. On the other hand, the absence of participation in international production and trade networks has immediate effect on the health of the local economy. Counties like Bistriţa-Năsăud, Braila, Buzău, Caraş-Severin, Calarasi, Dambovită, Hunedoara, Olt, Salaj, Tulcea, Valcea face a potential social risk resulting from the presence of companies with a large number of employees but with relatively weak economic performances. The formation of competitive advantages in industrial agglomerations has become a public concern for a very short time, where the most important role is played by the projects of developing competitiveness poles, initiated since 2009 by the Ministry of Economy, Commerce and Business Environment through the Industrial Policy Division. *The agglomerations that play the most important role at national level in terms of export performance and employment are those in the steel sector in Galaţi county, ships sector in Tulcea, auto sector in Argeş and footwear in Bihor.*

The prerequisites for competitive advance are very different between regions because the structure of the economy is very different. Certain regional economies, such as South West Oltenia, South-East and West, are specialized in a very limited number of sectors, other regions such as South Muntenia, North West and Center are very diversified. Although none of the situations is in itself favorable or unfavorable to competitiveness, this diverse picture clearly suggests different local needs for education, qualification and research, industrial restructuring and technological needs.

- The most developed regions are: Centre, Bucharest and West;
- The least developed regions are generally those in the North-East and South-East of Romania.

Table no. 18 EU Competitiveness Index, 2014

	Institution s	Position	Macroeconomic stability	Position	Basic educatio n	Position
Finland	1,77	1	0,86	6	3,94	1
Luxemburg	1,35	2	1,49	2	-0,87	23
Denmark	1,34	3	1,00	4	0,75	5
Netherlands	1,33	4	0,66	10	1,43	3
Sweden	1,29	5	1,43	3	0,11	14
Germany	0,79	6	0,74	8	0,49	6
Austria	0,74	7	0,71	9	-0,77	21
United Kingdom	0,72	8	-0,46	25	0,38	9
Ireland	0,64	9	-1,88	27	0,42	7
Belgium	0,45	10	0,24	14	0,29	11
France	0,29	11	-0,01	16	-0,17	16
Estonia	0,27	12	2,04	1	2,17	2
Malta	0,07	13	-0,20	20	:	
Cyprus	-0,01	14	-0,41	22	:	
Spain	-0,26	15	-0,21	21	-0,15	15
Portugal	-0,29	16	-1,15	26	0,12	13
Slovenia	-0,38	17	0,47	12	0,18	12
Poland	-0,43	18	-0,14	18	0,81	4
Lithuania	-0,55	19	-0,42	23	-0,52	20
Czech Republic	-0,61	20	0,61	11	-0,25	18
Latvia	-0,65	21	-0,09	17	0,32	10
Slovakia	-0,79	22	0,34	13	-0,24	17
Hungary	-0,83	23	-0,15	19	0,38	8
Italy	-1,21	24	-0,42	24	-0,46	19
Croatia	-1,24	25	0,96	5	-0,79	22
Greece	-1,34	26	-2,76	28	-0,96	24
Romania	-1,56	27	0,05	15	-2,98	26
Bulgaria	-1,70	28	0,78	7	-2,93	25

Source: Eurostat (European Commission (Joint Research Centre and Directorate-General for Regional and Urban Policy))

From the table above, it is noticed that Romania is on the last places in terms of education and institution development. As far as macroeconomic stability is concerned, Romania ranks 15th.

Global Competitiveness Index

Table no. 19 - Global Competitiveness Index

Country	2006	2007	2008	2009	2010	2011	2012	2013
Number of analyzed countries	125	131	134	133	139	142	144	148
U.S.	1	1	1	2	4	5	7	5
U.K.	2	9	12	13	12	10	8	10

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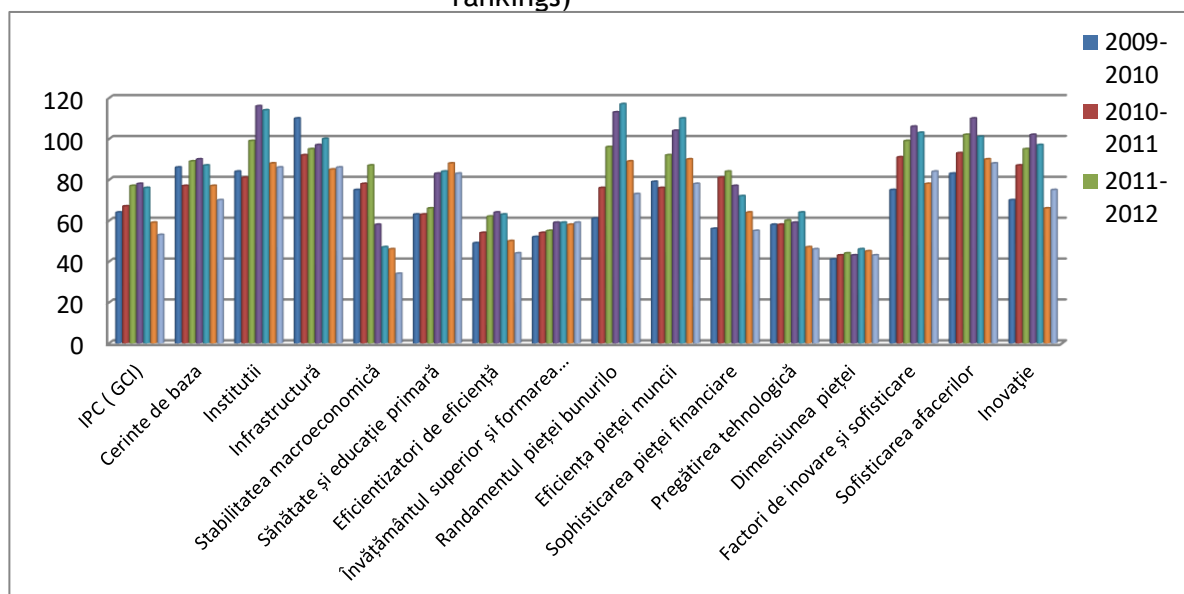
Denmark	3	3	3	5	9	8	12	15
Switzerland	4	2	2	1	1	1	1	1
Japan	5	8	9	8	6	9	10	9
China	35	34	30	29	27	26	29	29
Romania	73	70	68	64	67	77	78	76

Source: Competitiveness, Performance, Sustainability Dr. Marioara Iordan CS I Prof.univ.dr.

Pelinescu Elena, Bucharest, August 27, 2014

Romania's evolution over 2009-2015 period

Figure no. 138 Romania's Competitive Potential Index 2009-2015 (global rankings)



Source: Data processing based on The Global Competitiveness Report 2009-2010 (2010-2011; 2011-2012; 2012-2013; 2013-2014; 2014-2015; 2015-2016)

Both the chart above and the table show that Romania's Competitive Potential Index has undergone major changes in time. If in 2009 Romania ranked 64th out of about 140 competing countries, in 2012 there is a rather large descent in the global ranking.

In 2015, Romania advanced with 25 positions, which is due to the fact that the indicators compiling the IPC also advanced in the ranking. The macroeconomic stability has had a positive evolution (in 2009 rank = 75, 2016 rank = 34) and there are also other indicators that contributed to the accession of Romania in the ranking, for example: institutions, health and primary education, the efficiency of goods market, labor market efficiency, sophistication of the financial market, market size, business sophistication.

Training centers

According to the National Authority for Qualifications, in the South East Region there are 5 centers for evaluation and certification of professional competences obtained in other

ways than formal ones. These are presented in the table below. We can see that these centers offer various evaluations and certifications in qualifications such as: Farmer in vegetal crops and animal breeders, Beekeeper, Chef, Hotel Receptionist, Hotel Camerist, Waiter, Carpenter-Floorer, Builder, Stonecutter, Plasterer, Elders caregiver at home, Plumber for technical and sanitary installations and gas installations, construction electrician etc.

Also, at regional level there is a significant number of knowledge providers in STEM sectors (science, technology, engineering, mathematics), entrepreneurship and business. The main information about these providers and the training programs offered are presented in the Annexes.

h) Potential of specialization

The South East Region's specialization potential was determined by analyzing some relevant indicators for the economic activity in the region. Thus, the global utility method was used in order to be able to choose a number of priority sectors for investment. The global utility method is one of the multicriteria decision-making methods, because in order to select the optimal version - from several possible alternatives -are used a series of criteria, set by the decision-maker and considered relevant for the proposed purpose.

For each activity of the national economy (NACE Rev.2), the overall utility was calculated according to the following relevant indicators:

- Local active units, by activities of the national economy at level of NACE Rev.2 section, development regions and counties;
- Civil employment population by activities of the national economy at the level of NACE Rev.2 section, development regions and counties;
- Average number of employees by activities of the national economy at the level of NACE Rev.2 section, development regions and counties;
- Turnover from local units, by activities of the national economy at the level of NACE Rev.2 section, development regions and counties, current prices;
- Net investment in local units, by activities of the national economy at the level of NACE Rev.2 section, development regions and counties.

The analyzed data were provided by the National Institute of Statistics - TEMPO database. At the regional level were analyzed the data from 2011-2015 period, and at the county level, the year 2015.

With multiple decision criteria, hence multiple consequences that are expressed by different units of measure, the utility that measures the degree to which a decisional

variable is preferable to another is used. All the consequences of a decision will be transformed into utilities that can be logically hierarchized.

The global utility method involves performing the following steps:

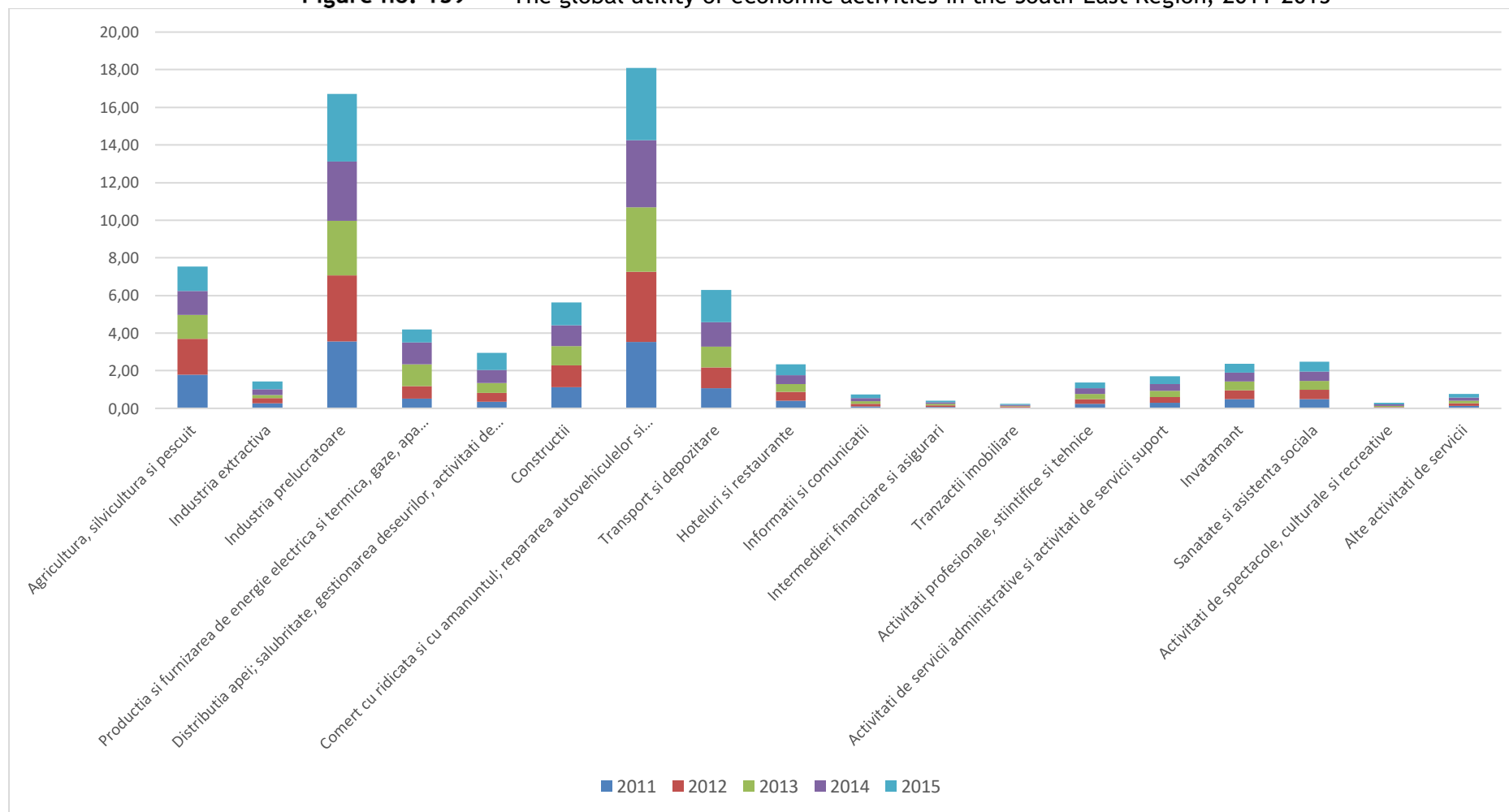
- The choice of a variation range $[0, 1]$, considered useful, with $u(v_i)$;
- It will be assigned to the most favorable decision-making consequence, the utility 1, denoted by $u(v_i) = 1$, and to the most unfavorable decisional consequences the utility 0, $u(v_i) = 0$;
- The rest of utilities will be calculated by linear interpolation using the formula $u_{ij} = (a_{ij} - a_{j0}) / (a_{j1} - a_{j0})$.

In the case of identifying the specialization potential, all decisional criteria have the same importance factor and the global utility is calculated according to the formula: $U_g(v_i) = \sum U_{ij}$, where $U_g(v_i)$ = the global utility of the variant "i" and U_{ij} = utility of the variant "i" by the criterion "j". The optimal variant will be chosen using the formula $V_{opt} = \max U_g(v_i)$.

The processing of available data on the activities of the national economy for the period 2011 - 2015 in the South - East Region reveals a series of trends in the region 's specialization potential. At regional level, over the five years under analysis, there are some economic activities that dominate the activity of the active units in the region, such as: Manufacturing, Wholesale and Retail; repair of vehicles and motorcycles, Agriculture, forestry and fishing, Transport and storage, Constructions, Water distribution; Sanitation, waste management, decontamination activities.

The Smart Specialization Strategy of the South-East Development Region

Figure no. 139 The global utility of economic activities in the South-East Region, 2011-2015



Source: Processing data from the National Institute of Statistics, 2017

The Smart Specialization Strategy for South-East Region

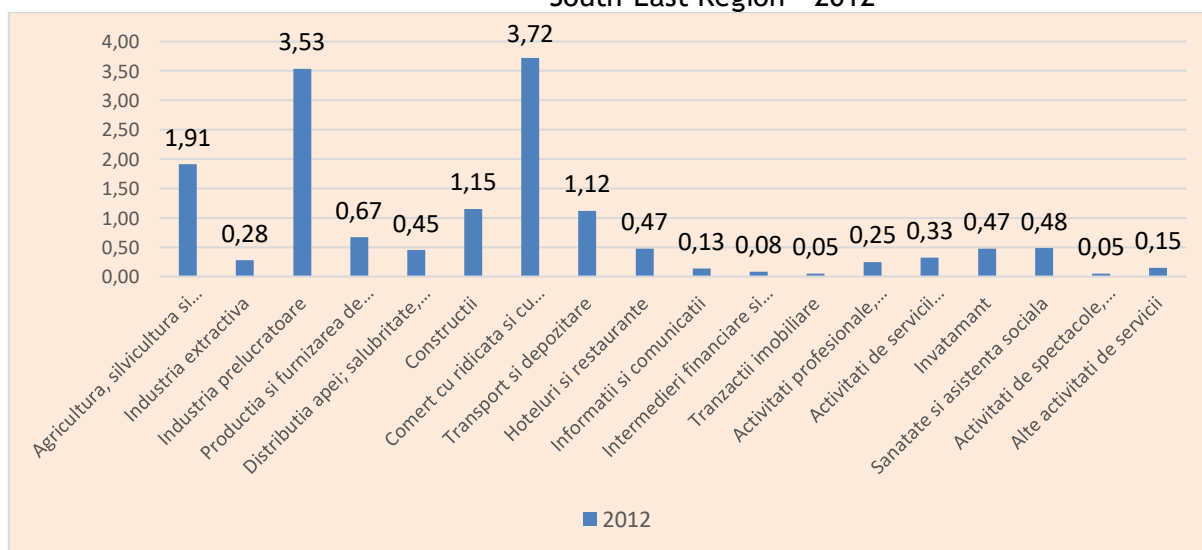
In 2011, in the South-East Region, the least represented economic activities were Presentations, Cultural and Recreational Activities, Real Estate Transactions and Financial Intermediation and Insurance. On the other hand, the economic activities with the greatest global utility from the perspective of the analyzed indicators were Wholesale and Retail; Repair of Vehicles and Motorcycles, Manufacturing, Agriculture, Forestry and Fishing, Construction, Transportation and Storage. It can be noticed that the largest number of employees in the region works in the Wholesale and Retail trade; Repair of Vehicles and Motorcycles, where there is also the largest number of local active units.

Figure no. 140 The global utility of economic activities according to NACE Rev.2 in the South-East Region - 2011



Source: Processing data from the National Institute of Statistics, 2017

Figure no. 141 The global utility of economic activities according to NACE Rev.2 in the South-East Region - 2012



Source: Processing data from the National Institute of Statistics, 2017

In 2012, in the South East Region, the largest global utility was recorded in Wholesale and Retail trade; Repair of vehicles and motorcycles and Manufacturing. Real estate transactions and Presentations, cultural and recreational activities had the least global utility. These trends are also preserved in the following years of the analyzed period.

Analyzing the data from the indicators under consideration, it can be seen, for example, that in Agriculture, forestry and fishing the number of local active units increased from 2818 in 2011 to 3379 in 2015. The same upward trend is also observed for the average number of the employees in this activity. It is also noted that although there are a large number of local units in transport and storage activities, which hire a significant number of employees (34051 persons in 2015), the turnover of these units is only 6691 million lei, the volume of the investments made being quite low. At the level of 2015 it can be noticed that the lowest number of local units active at the level of the region was registered in the extractive industry. This was obvious, as the region does not have potential in this area. Between 2011 and 2015, there is a very low potential for specialization in the field of Presentations, cultural and recreational activities and Real estate transactions. Although the Construction sector does not have the highest global utility in the region, the registered turnover is significant for the region and is growing.

At county level, the results of the analysis indicate that in **Brăila County**, in 2015, there is a **great potential for specialization in Wholesale and retail trade; Repair of vehicles and motorcycles, Manufacturing, Agriculture, forestry and fishing, Transport and Storage and Construction**. The lowest global utility was recorded in Presentation, cultural and recreational activities. In Braila County, most employees are in Manufacturing and in Wholesale and retail trade; Repair of vehicles and motorcycles, economic activities with the highest turnover.

In **Buzau County**, the **Manufacturing industry** had a global utility of 3,83 in 2015, being the economic activity with the largest number of employees in the county, followed by **Wholesale and retail trade; Repair of vehicles and motorcycles**. The smallest number of employees is in the field of real estate transactions, a domain that has the lowest global utility.

In **Constanta County**, the largest global utility is in **Wholesale and retail trade; Repair of vehicles and motorcycles**. This activity records a turnover of 18767 in 2015. The next activities with specialization potential are **Manufacturing, Transport and storage, Construction, Agriculture, forestry and fishing**. The lowest overall utility in the county is recorded in the economic activities Mining industry, Real estate transactions, Financial intermediation and insurance, Information and communications, Presentations, cultural and recreational activities.

Also in **Galati County** predominates the **Wholesale and Retail trade; repair of vehicles and motorcycles and manufacturing**. Also, **Construction and Transportation and storage** have a higher global utility. *Although there are only 11 active local units in the production and supply of electricity and heat, gas, hot water and air conditioning, these units hire 1640 employees, compared to Agriculture, forestry and fisheries where the number of units is significantly higher.*

In **Tulcea County**, the largest global utility is found in **Wholesale and retail trade; Repair of vehicles and motorcycles, Manufacturing, Agriculture, forestry and fishing, Water distribution; sanitation, waste management, decontamination activities, Production and supply of electricity and heat, gas, hot water and air conditioning, Information and communications**. The manufacturing industry hires the largest number of employees and the largest turnover is registered in the trade. Although there are no data available in the 2011-2015 period, on turnover and net investment in fishing in Tulcea County, there is certainly potential for specialization in this area due to the Danube Delta.

In **Vrancea County**, the fields with specialization potential are also **Wholesale and retail trade; Repair of vehicles and motorcycles, Manufacturing, Agriculture, forestry and fishing**. Vrancea County is well known at national level for Cotesti, Odobești and Panciu vineyards and also for the agricultural potential of the county, with 52.000 people dealing with Agriculture, forestry and fishing.

Social Innovation in the South East Region

The Social Innovation was defined by the European Commission in the Guide of Social Innovation (2013) as the development and implementation of new ideas (products, services and models) that meet social needs and create new social relationships and collaboration. The social innovation responds to very important social needs that affect social interaction and aims at improving the well-being of the society as a whole. Unlike the classic concept of innovation, the main objective of social innovation is to determine the social change.

The social innovation aims at developing and implementing new ideas for products, services or social organizational models designed to respond to social, territorial and environmental requests and challenges such as aging, depopulation, reconciliation of work and family life, managing diversity, combating youth unemployment, integrating the most excluded from the labor market and tackling climate change.

The social innovation promotes the knowledge transfer, is multidisciplinary, involves participatory management and is driven by the demand for social services. The social innovation is achieved in connection with social design, evaluation and monitoring. Not every move in the social sphere can be considered social innovation. The effective implementation of social measures may simply be the specific approach of implementing a defined action plan²².

According to a motion for a resolution of the European Parliament on social entrepreneurship and social innovation in combating unemployment, the social entrepreneurship and the social innovation will play a key role in continuing the development of the social economy. It is therefore essential to pay special attention to education and training. The EU must inspire the younger generation with this innovative and entrepreneurial spirit, from an early age. In addition, it is necessary to avoid confusion between the social economy and corporate social responsibility (CSR). The primary objective of a social economy enterprise is to have a social impact rather than to make a profit for its owners or shareholders, while CSR is a voluntary integration of social and environmental objectives into the commercial programs of traditional businesses. The social innovation and social entrepreneurship are therefore an essential stage in the development of the social economy and, to encourage this, efforts should be made in the following areas:

- education and training,
- increasing the funding,
- a greater visibility at European and national level, as well as the exchange of information and best practices,
- promoting the development of the social economy in the EU and in the Member States,
- improving the legal framework.

In general, the main factors that can stimulate the social innovation are:

- The interest that the society gives to the social field and to the expected results;
- A favorable climate for the intersectoral dialogue;
- Attracting private investment in the social field;

At regional level, the public authorities play an extremely important role in promoting and developing social innovation. Thus, the public authorities have to support social innovation through various initiatives, capitalize on the process of collective learning driven by social innovation, promote collaboration among various members of civil society and businesses, and evaluate the added value of social innovation.

²² Stănescu, 2009

The main forms of organization of the social economy that can determine social innovation are the associations and foundations, cooperatives and mutual societies and social enterprises. In Romania, from the point of view of the legal forms of the organizations, the social economy is formed by associations, foundations, cooperatives, mutual aid houses, and commercial companies owned by social economy organizations (Barna, 2014).

According to the 2014 Social Economy Atlas, in 2012, the social economy sector in Romania included 39,347 active organizations that earned revenues of 12,298,111 thousand Ron and employed about 131,127 people. The regions that concentrated the largest number of social economy organizations in 2012 were: the Center Region (19% of the total social economy associations - SEO), the North-East Region (17% of the total SEO) and the Bucharest-Ilfov Tegion with 16% SEO. The regions that generated the highest incomes from the social economy in 2012 were: Bucharest-Ilfov region with 27% of total SEO revenues, and North-East and Center regions, with 13% of total SEO revenues. The largest fixed assets were accumulated by the Bucharest-Ilfov regions (26% of total SEO assets), North-East (14% of total SEO assets), and on the 3rd place, the West and South-Muntenia regions, 12% of the total fixed assets SEO. Most jobs in the social economy were created in the Bucharest-Ilfov regions (21% of the total number of employees in SEOs), and the North-East and Central regions, equal to 15% of the total SEO employees.

In 2012, in the South-East Region there were 3,449 social economy organizations generating total revenues of 959,240 thousand Ron and 11,531 employees. In what concerns the associations and foundations at the level of the region, 17.4% were in the agricultural field, 3.3% were community/forestry, 8.1% were in the education field, 5.85% had cultural activities, 8.8% developed sport activities, 9.2% were in the field of environmental protection, 9% civic organizations, 5.7% religious, 7.9% tourism, 8.8% professional, 6.9% social charity and 6.1% health. As far as the craft cooperatives are concerned, there were 132 organizations in the South-East region in 2012, and the consumption cooperatives were 113. The number of agricultural cooperatives in the South-East Region is 51 and the number of reciprocal retirement homes is 21²³.

Conclusions

In order to establish the main smart specialization sectors of the South-East Development Region, several economic indicators have to be taken into account:

From the perspective of the **average number of employees**, by activities of the industry of the NACE Rev.2, the following branches/sub-branches of industry are noted:

²³ Barna, C. - Atlas of Social Economy 2014.

The Smart Specialization Strategy for the South-East Development Region

- Manufacturing Industry with the following sub-branches: Manufacture of clothing, Metallurgy, Manufacture of other transport equipment, Repair, maintenance and installation of machinery and equipment;
- Water distribution, sanitation, waste management, decontamination activities;
- Extractive industry.

Analyzing the Revealed Export Advantage (RXA) between January and December 2016, it can be concluded that, from this indicator perspective, the following Combined Nomenclature (CN) product groups have comparative advantages: 01. Live animals; 02. Meat and edible offal; 03. Fish and crustaceans; 08. Edible fruit; 10. Cereals; 11. Products of the milling industry; 12. Seeds and oleaginous fruits; industrial or medicinal plants; 14. Weaving materials; 15. Animal or vegetable fats and oils; 18. Cocoa and cocoa products; 23. Residues of the food industry; 25. Salt; sulfur, stones; plaster, lime and cement; 27. Fuel and mineral oils; bituminous materials; 28. Inorganic chemicals; 37. Photographic or cinematographic goods; 39. Plastics and articles of plastics; 43. Fur and articles of fur; 51. Wool; 55. Discontinuous synthetic or artificial fibers; 62. Articles of apparel and clothing accessories, other than knitted or crocheted; 70. Glass and glassware; 72. Cast iron, iron and steel; 79. Zinc and articles thereof; 83. Miscellaneous articles of base metal; 89. Boats, ships and floating structures.

And following the analysis of the RDI infrastructure and in particular the clustering potential of the South-East Development Region, the main areas of smart specialization identified are: Manufacturing industry with sub-branches Manufacturing of garments, Manufacturing of transport means, Manufacturing and Electricity supply, Eco-technologies, Tourism, Information and communication technology, Health.

In conclusion, we highlight the following sectors with smart specialization potential:

- Naval industry;
- Industrial Engineering and Transportation;
- Textile/clothing industry;
- Agriculture and fisheries;
- Biotechnology;
- Eco-technologies;
- ITC;
- Tourism.

1.2 Bonds / relationships with the rest of the world and positioning the region in the European Union / global economy

Introduction

Methodological approach

This chapter has the purpose of analyzing the positioning of South East Region in comparison with other EU territories with regard to their structural characteristics, competitive advantages and performances, from the specific point of view of research, development and innovation policies and strategies.

Despite the fact that the purpose of the present strategy is strictly related to R&D and innovation policies, a correct comparison exercise should include a multi-dimensional approach, which, together with the R&D related performances of the territories, also include their structural features, both geographical, and socio-economic, as these latter are clear factors that may affect or boost the R&D related performance of a territory.

This multi-dimensional approach will be followed especially for the choice of the regions/territories with which South East Region will be compared, in order to guarantee a relevant comparison of South East Region with territories having either similar R&D performances and/or similar structural features.

The chapter will be structured as follows: after the methodological introduction (which will include the choice of the territories to be compared and its justification), a first section will be dedicated to the identification of all the possible competitive advantages (and disadvantages) of the South East Region in relation to the identified comparison group of regions. This analysis will focus on those structural features of territories which are suitable to influence their R&D and innovation performances, like the degree of infrastructuring, the structure of the business environment, the HR and knowledge aspects as well as the quality of public administration. The purpose is to understand which are the key aspects of South East Region that are most suitable to be considered as a good starting basis for R&D policies in South East Region, in comparison with other territories, and which are, instead, the ones on which there is more work to be done in order to create the best pre-conditions for the effectiveness of these policies.

The second part of the chapter will then focus on the current R&D and innovation related performances of RSE in comparison with the other territories. This benchmarking exercise has the

purpose to understand which are the specific gaps in the R&D sectors that RSE presents in comparison with other territories that can be classified as “modest innovators”, but also to understand in concrete terms the differences between the performances of RSE and those of “strong innovators” regions presenting similar structural characteristics.

The choice of the comparison group

The correct choice of the comparison group is a key aspect of any regional benchmarking analysis/comparison exercise.

From the strictly technical point of view, the literature is clear in indicating that a correct comparison should be made only with territories having strong similarities in features directly related to the specific field of analysis (R&D and innovation in this case).

The authors share this view, but, as mentioned above, believe that interesting reflections can also stem from a comparison with territories having different characteristics regarding their R&D related features but similar to South East Region as regard other structural aspects.

This has driven to the use of a multidimensional approach in choosing the regions to be compared, that took into account the following elements:

- The multiple structural similarity conditions for innovation policies as identified by the EC JRC ²⁴.
- The key geographic/geopolitical aspects of South East Region: the South East Region is a peripheral region, both in relationship to its own country and to the EU in general; it does not include its country capital and it is a maritime region.
- The level of socio-economic development of South East Region: a less developed region, in the terms used by the ESI Funds discipline, with a pro capita GDP equal to 24,91% of EU average;
- The classification of South East Region as “modest innovator” in the framework of the EU Commission “Regional Innovation Scoreboard”;
- Possible previous partnerships or collaborations between South East Region and other EU regions, that might justify their inclusion in the comparison group.

²⁴ European Commission, Joint Research Center “Regional benchmarking in the smart specialisation process: Identification of reference regions based on structural similarity”, S3 Working Paper Series No. 03/2014. The paper adopts a multifaced methodology to identify similar territories based on a set of criteria, grouped in 7 dimensions: geo-demographic, human resources and education, technological specialization, economic sectorial structure, firms size, openness and institutions& values. A “distance index” is then produced based on these dimensions and representing the degree of structural similarities among Regions.

The first of this element, alone, represents the most refined methodology for a correct technical identification of the comparison group, according to the European Commission²⁵.

For this reason the identification of the comparison group has started from the utilization of the benchmarking search engine made available²⁶ by the EC, based on the “distance index” established with that methodology.

A number of 4 regions have been identified by considering those having the lower “distance index” and taking care to choose maximum 2 from Romania and maximum 1 from each other member states. The result is the following:

Table no. 20 Regions with the lowest "distance index"

Country	Region	Distance index
Romania	Centre	0,0161
Romania	Sud Muntenia	0,0164
Poland	Podlaskie	0,0238
Bulgaria	Yuzhen tsentralen	0,0277

However, the technical precision of the JRC methodological tool represents also its limitation, as the region presenting the lowest “distance index” are often coming from the same country, or from bordering/similar ones with the one analyzed.

In order to improve the scope of the comparison, by including in the group, territories that are perhaps less similar from the technical point of view to RSE but with which the comparison itself might bring important elements of discussion, it has been decided to add to the group a number of other regions according to the following criteria:

- 2 other “modest innovators” region - in the framework of the EC “regional innovation scoreboard”, sharing the same geo-political features²⁷ of RSE and belonging to the group of the less developed region as defined by the ESIF Regulations.
- 1 “strong innovator region, sharing the same geo-political features of RSE and belonging to the group of the less developed region as defined by the ESIF Regulations.

This resulted in the following selection:

²⁵ Ibidem

²⁶ see <http://s3platform.jrc.ec.europa.eu/regional-benchmarking>

²⁷ Peripheral, maritime and not capital regions.

Table no. 21 Regions entered in the "comparison group"

Country	Region	ESIF category	Regional Innovation Scoreboard classification
Poland	Walminsko Mazurskie	Less developed	Modest innovator
Greece	Anatoliki Makedonia	Less developed	Modest innovator
United Kingdom	Wales	Less developed	Strong innovator

Although the choice of Wales may appear inappropriate considering the distance between its degree of development and South East Region, both in general terms and in relation with R&D policies, we consider that having a strong innovator in the comparison group can contribute positively to the understanding of the gaps compared to this kind of territories and to the discussion on the policies to adopt.

Finally, the comparison group will be completed by the Italian region of Sicily, a region with aspects of proximity to South East Region, being peripheral, maritime, a less developed region and a "moderate innovator".

The final set of regions that will be considered for the comparison is shown in the table below:

Table no. 22 Regions entered in the "comparison group"

No.	Country	Region	Justification
1	Romania	Centre	Structural similarity (JRC methodology)
2	Romania	South Muntenia	Structural similarity (JRC methodology)
3	Poland	Podlaskie	Structural similarity (JRC methodology)
4	Bulgaria	Yuzhen tsentralen	Structural similarity (JRC methodology)
5	Poland	Walminsko Mazurskie	Modest innovator with similar geopolitical and economical situation
6	Greece	Anatoliki Makedonia	Modest innovator with similar geopolitical and economical situation
7	United Kingdom	Wales	Strong innovator with similar geopolitical and economical situation
8	Italy	Sicily	Similar Region with previous

			collaboration experiences
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Competitive advantages of South East Region

This section has the purpose of analyzing the competitive advantages that South East Region may have towards the regions within the comparison group, with reference to the structural, social and economic factor that may influence the development of R&D sector and the effectiveness of the related strategies and policies.

The main source of reference will be the EU Regional Competitiveness index 2016, elaborated by the European Commission, together with its main components and indicators.

The attention will focus not only on the overall value of the RCI, but also on the positioning of South East Region with regards to the its specific components, especially on those which could represent the most important success factors for smart specialization strategies.

Accordingly, the South East Region and the regions from the comparison group will be analyzed on the basis of the following aspects:

- overall competitiveness;
- institutions;
- macroeconomic stability;
- infrastructure;
- higher education and lifelong learning;
- labor market efficiency
- market size
- technological readiness
- business sophistication.

Institutions

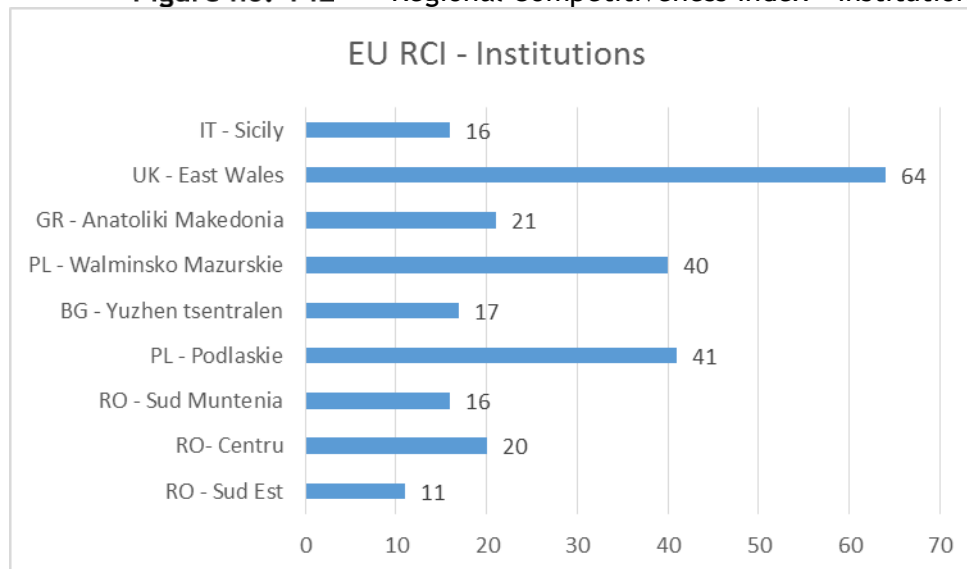
The institutional framework represents a key point for the competitiveness of a territory and for its ability to generate innovation dynamics and policies.

In the framework of the EU regional competitiveness index methodology, the “institutions” pillar focuses on a wide set of aspects related to regional and national governance, all based on official indicators from verified sources. At regional level, phenomena like corruption, impartiality and

quality and accountability of public administration are assessed; the index calculated for each EU region takes into account, however, also indicators calculated at the respective national level, related for example to public procurement, political stability, property rights, efficiency of the judicial system, etc.

The following graph shows the value of the “institutions” index for South East Region and for the other 8 regions from the comparison group.

Figure no. 142 Regional Competitiveness Index - Institutions



Source: author data processing

As the above graphic shows, the institutional framework of the South East Region is scored the lowest among the comparison group, resulting lower even than the other two Romanian regions. In conclusion, the institutional framework represents an aspect with negative influence on the overall competitiveness of the Region and on which to invest in the future, in order to transform it slowly into a competitive advantage.

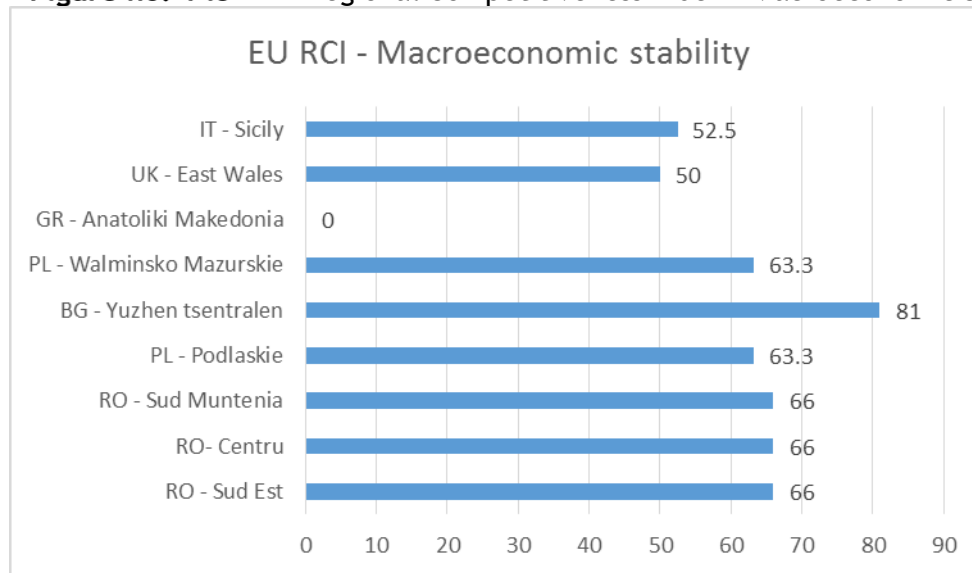
Macroeconomic stability

As a natural pre-condition for the sparkling of development and innovation dynamics, macroeconomic stability is an interesting aspect to assess within the comparison group.

The index is the result of the combination of several indicators related to public finance, like the public deficit and the public debt, calculated at national level.

The following graph presents the value of the index for the 9 regions:

Figure no. 143 Regional Competitiveness Index - Macroeconomic Stability



Source: author data processing

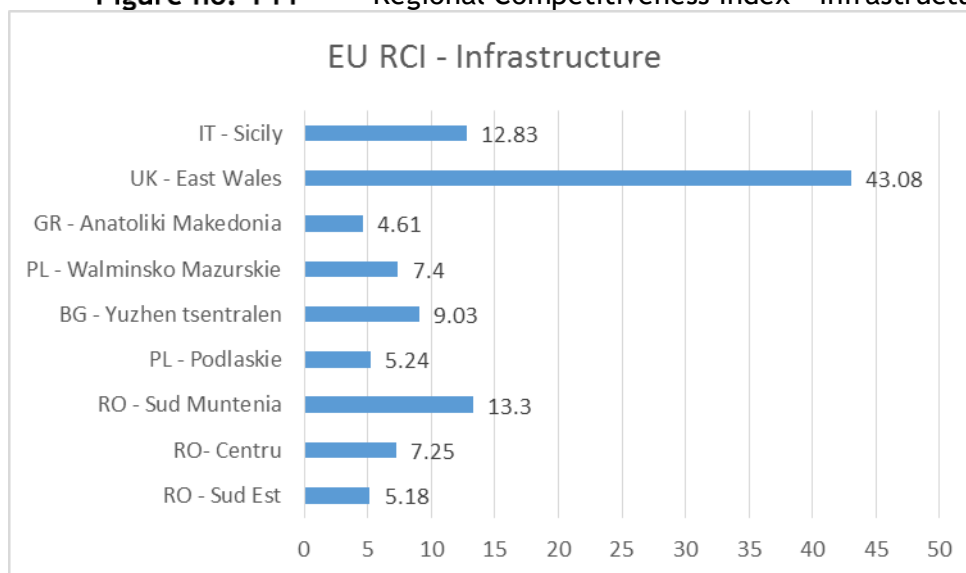
Macroeconomic stability appears to be a considerable competitive advantage for the Romanian regions; indeed, the concrete effects of this element on innovation policies can only be seen indirectly and in a long term, through the dynamics of the financial markets that may favor investments in the developed regions of the country, including R&D and innovation related initiatives.

Infrastructure

Regarding the development dynamic, even innovation and research are conditioned by the infrastructural situation of a territory. Both private and public innovative investments need connection to the market, especially from the logistic point of view. Thus the transport infrastructure of a region is a key element of competitiveness.

The infrastructure index calculated as a pillar of the RCI 2016 is the combination of different indicators of accessibility to transport infrastructure (rail, road and air transport). The index is presented in the following graph:

Figure no. 144 Regional Competitiveness Index - Infrastructure



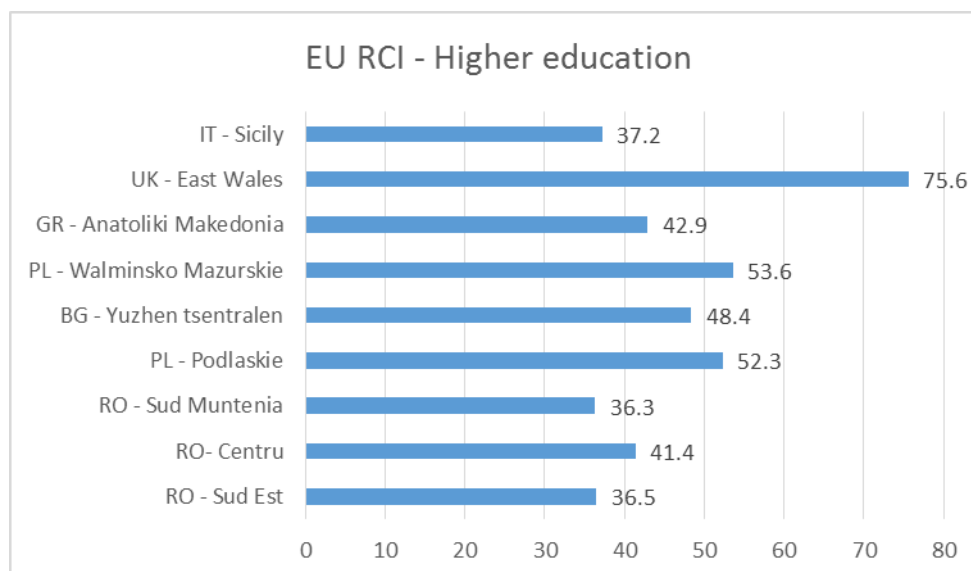
Source: author data processing

At infrastructure level, the results shows huge differences between regions like Wales and the ones from eastern Europe. The South East Region index is higher only compared to the greek region of Anatoliki Makedonia. Even in comparison with the other Romanian regions of the group, South East Region shows the worst value, especially in comparison with the bordering region of South Muntenia.

Higher education and lifelong learning

The human factor is crucial in innovation dynamics, thus a high average level of education of inhabitants, together with the availability of educational infrastructure are a pre-condition for the development of innovation trends of a territory. The higher education and lifelong learning index is a combination of the most relevant Eurostat indicators referring to the level of education, participation to lifelong learning initiatives and to early school leaves.

Figure no. 145 Regional Competitiveness Index - Higher Education and Lifelong Learning



Source: author data processing

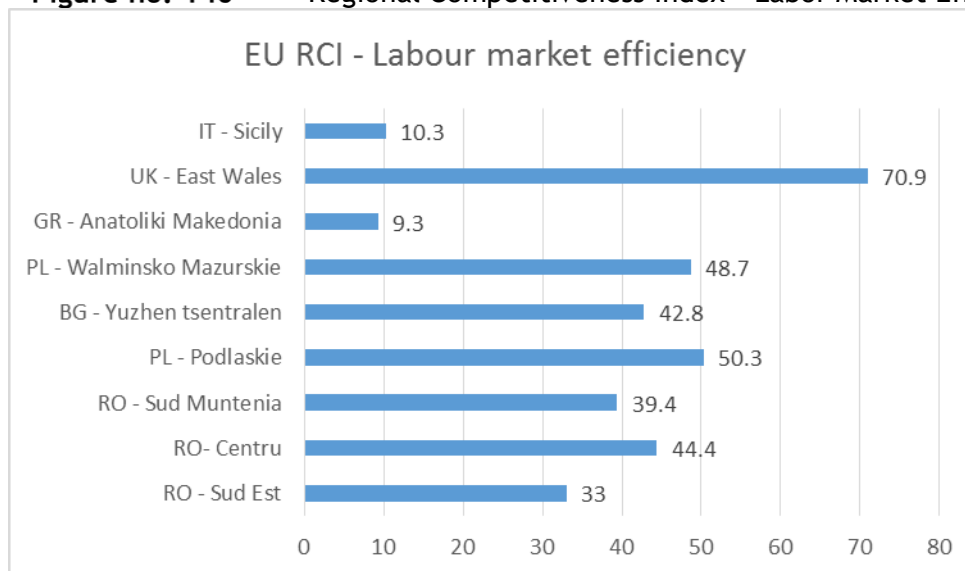
The analysis shows that the South East Region is positioned on the lowest part of the group, with an index value only higher than the bordering South Muntenia Region. All other regions register higher values, with a significant peak for East Wales, despite its status of a less developed EU region.

Labor market efficiency

Labor, one of the basic production factors, multiplies its importance in business environments linked to R&D and innovation. An effective and efficient labor market can be a factor of crucial importance in generating innovative development processes at regional level. The labor market efficiency index calculated within RCI 2016 takes into account the main EUROSTAT indicators related to regional employment, unemployment, labor productivity and gender balance in labor.

The following graph shows the values of the index for the concerned regions:

Figure no. 146 Regional Competitiveness Index - Labor Market Efficiency



Source: author data processing

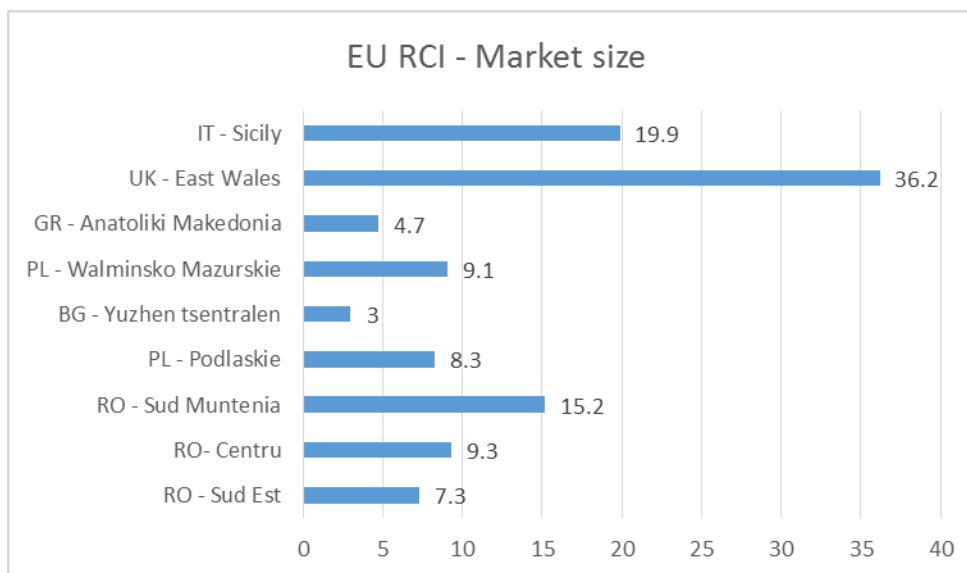
Figures show a huge gap among the most performing region of the group - East Wales - and the worst ones, Sicily and Anatoliki Makedonia. Within this range, the South East Region presents values more or less in line with the other Romanian regions, although slightly worse, while the Bulgarian and Polish regions present better values.

Market size

Although the structure of the contemporary economy is more and more globalized and innovation processes may be easily generated by business opportunity very far in space, the capacity of the internal market of a region can still be consider a factor that may have an importance in the birth of competitive firms that are suitable to start activity of R&D and/or innovation processes. The market size index within RCI 2016 takes into account the purchasing powers of households, the regional GDP and the population of the regions.

The values for RSE and for the comparison group are shown in the graph below:

Figure no. 147 Regional Competitiveness Index - The size of the regional market



Source: author data processing

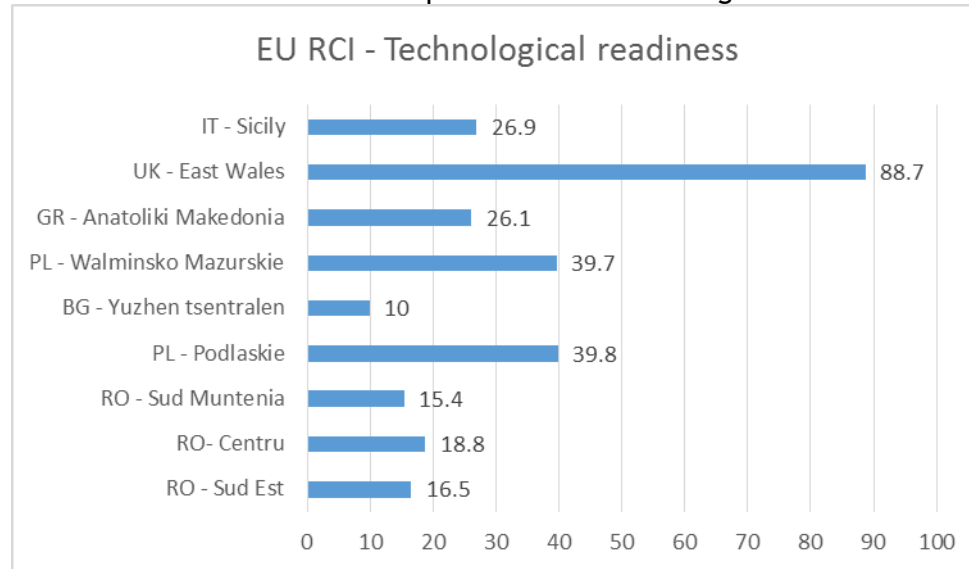
Data show that the market size index for RSE is far from the top values recorded by East Wales and Sicily, substantially in line with the other Romanian regions and with the Polish ones, and widely better than the ones related to the Bulgarian region of Yuzhen tsentralen and the one of Anatoliki Makedonia.

Technological readiness

The access to the most performing ICT infrastructure as well as the concrete use of the internet by individuals and enterprises are among the indicators taken into consideration in the construction of the Technological readiness index within RCI 2016.

The graph shows the values of the index for the selected regions.

Figure no. 148 Regional Competitiveness Index - Adaptability of the business environment to high-performance technologies



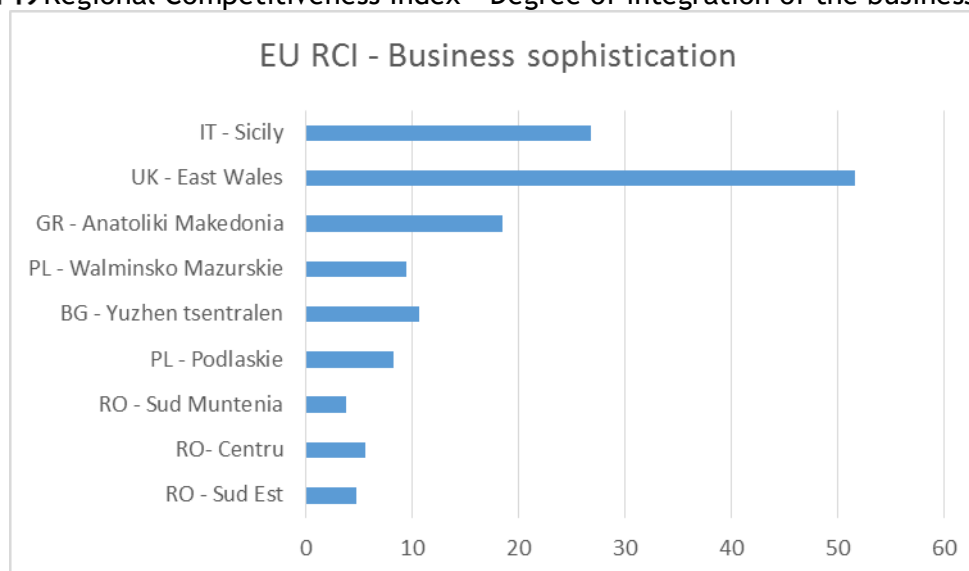
Source: author data processing

The values of the South East Region index are in line with the other Romanian regions, better than Bulgaria but with a significant distance from the more performing polish, Italian and greek regions.

Business sophistication

The preparation of the business environment to enter innovation processes is another key aspect for understanding the positioning of South East Region compared to the other regions. The business sophistication index combines statistics related to the number of enterprises that are active in particularly advanced services sectors with data about the number of enterprises that actually participated to cooperation and innovation initiatives.

Figure no. 149 Regional Competitiveness Index - Degree of integration of the business environment



Source: author data processing

The results show the uniformity of the indicators presented above, the South-East Region being included in the low value list, with a higher value of the index only compared to the South-Muntenia Region.

Overall competitiveness: the Regional competitiveness index.

The merging of the analyzed issues consists of the Regional Competitiveness Index, calculated by the European Commission in 2016.

The following table shows the value of the overall index for all the selected regions as well as its final overall ranking among the 263 European regions considered.

Table no. 23 Regional Competitiveness Index for the regions selected in the analysis

Country	Region	RCI 2016 (0-100)	Rank (over 263 regions)
Romania	South East	0,1	262
Romania	Centre	8,2	246
Romania	South Muntenia	5,7	254
Poland	Podlaskie	29,7	211
Bulgaria	Yuzhen tsentralen	11	243
Poland	Walminsko Mazurskie	29,4	215
Greece	Anatoliki Makedonia	0,2	261
United Kingdom	Wales	68,4	79
Italy	Sicily	15,3	237

The table shows that the South East Region has the lowest level of competitiveness in the selected group and is among the last positions of the European ranking.²⁸

Conclusion: which competitive advantages?

The comparison with the 8 selected regions, on the several aspects of regional competitiveness related to innovation has not lead to identify any particular competitive advantage of the region. In all the aspects considered, the South East Region shows currently statistical trends that are worse of the great majority of the compared regions. Differences from other regions are less significant in terms of macroeconomic stability or labor market efficiency, but without having a decisive influence on global competitiveness.

Following the results obtained on the basis of statistical information, the research of the competitive advantages of the South-East Region should include an approach of sources of qualitative origin, which allow the analysis of the future perspectives of the development of the region and of the country.

Innovation and R&D related performances: a benchmarking analysis.

The present section proposes the comparison approach through which South East Region and the 8 “peer” regions will be, this time, analyzed under the profile of their inclination towards Innovation and R&D and the effectiveness and efficiency of Innovation related policies and dynamics.

The starting point is the general assessment of the regions according to the EC Regional Innovation Scoreboard, which distributes the comparison group as follows:

Category	Region
Strong Innovator	East Wales
Moderate Innovator	Sicily, Podlaskie
Modest Innovator	South East, Centre, South Muntenia, Yuzhen tsentralen, Walminsko Mazurskie, Anatoliki Makedonia

Beyond this general categorization, the analysis of the specific aspects of performance will allow the benchmarking of South East Region with all the other components of the comparison group.

The 9 regions will be compared based on the following aspects:

- The use of 5 indicators for the calculation of the regional innovation scoreboard:

²⁸ The only EU region registering a worse RCI is the French overseas region of Guyane

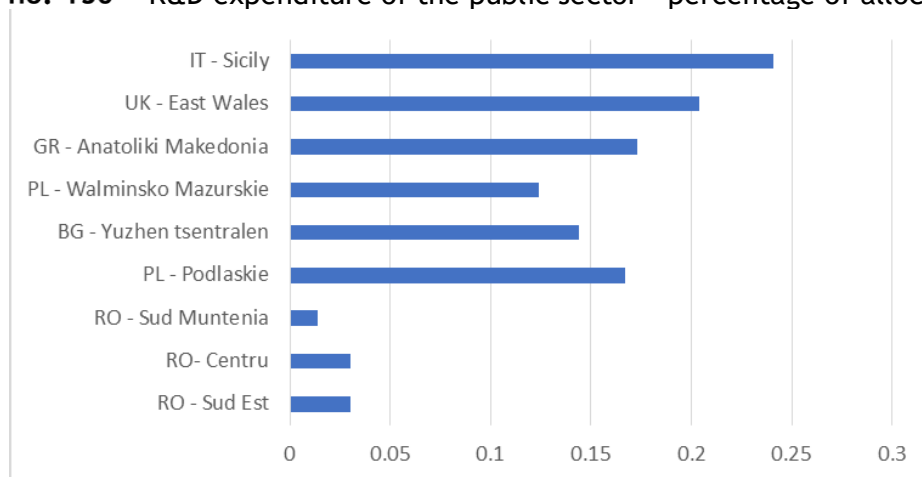
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- R&D expenditure of the public sector
 - R&D expenditure of the business sector
 - non R&D innovation expenditure
 - SMEs innovating in-house
 - Innovating SMEs collaborating with others
- The use of 3 additional indicators that could also transmit a picture of the importance of R&D and innovation for the public and private actors involved in the development of the regions:
- presence of a RIS3 strategy
 - ESIF expenditure in research and innovation
 - allocated Horizon 2020 funds

R&D expenditure of the public sector

The comparison is based on the normalized Regional Innovation Scoreboard database which presents the following values:

Figure no. 150 R&D expenditure of the public sector - percentage of allocated budget



Source: author data processing

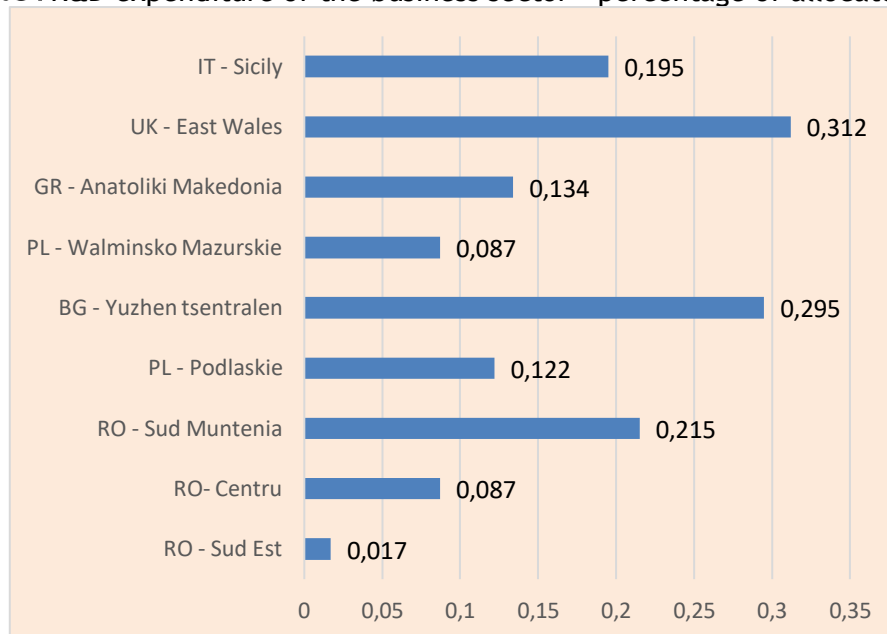
Together with the other Romanian Regions, the South East Region presents quite a scarce situation in terms of public R&D expenditure compared to the other regions of the group. It has to be noted

how curiously the highest value does not belong to the strong innovator region of the group (Wales), but to a moderate innovator region (Sicily).

R&D expenditure of the business sector

Still from the normalized RIS database, the values for the comparing regions are shown in the following table:

Figure no. 151 R&D expenditure of the business sector - percentage of allocated budget



Source: author data processing

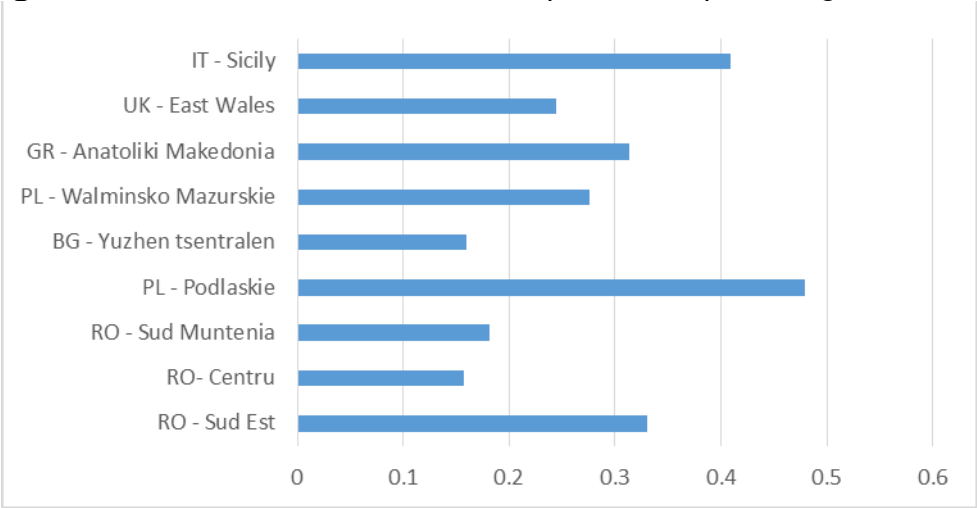
The value for RSE is by far the weakest, as a result of a very scarce inclination of business to invest in R&D. The gap, even with the other Romanian regions, is remarkable. Interesting the good performances of the Bulgarian region and of the Romanian region of South Muntenia, which record the best value after Wales, a strong innovator region.

Non R&D innovation expenditure

Switching to the expenditure related to innovation, rather than R&D, the following values²⁹ reveal a much better performance of the South East Region:

²⁹ Data for BG – Yuzhen tsentralen and UK – East Wales are only available and shown at the upper NUTS level

Figure no. 152 Non R&D innovation expenditure - percentage of allocated budget



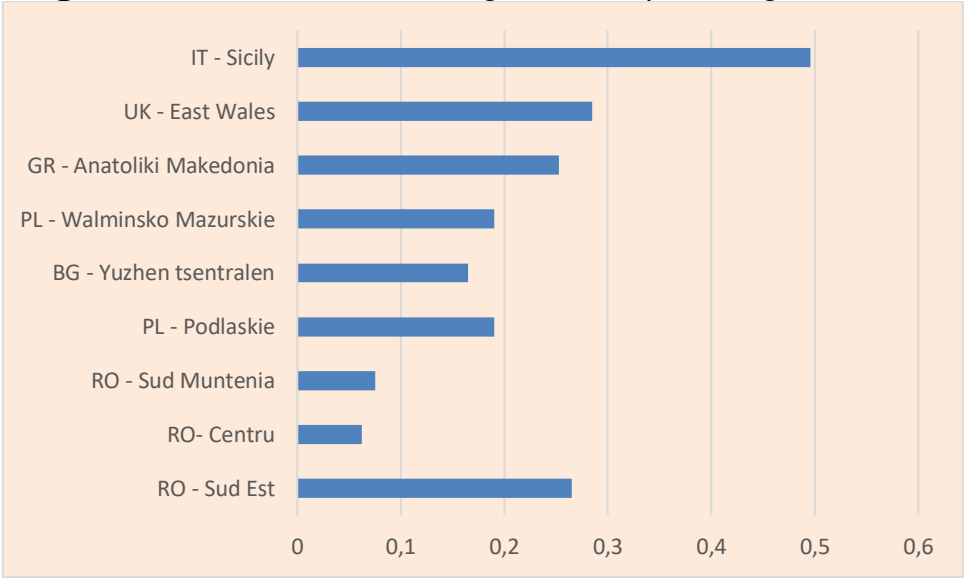
Source: author data processing

The South East Region registers the best performance after Podlaskie and Sicily, overtaking Wales and performing much better than the other Romanian regions.

SMEs innovating in-house

Coming to the number of SMEs that are performing in-house innovation processes, the values show the following situation:

Figure no. 153 SMEs innovating in-house - percentage of allocated budget



Source: author data processing

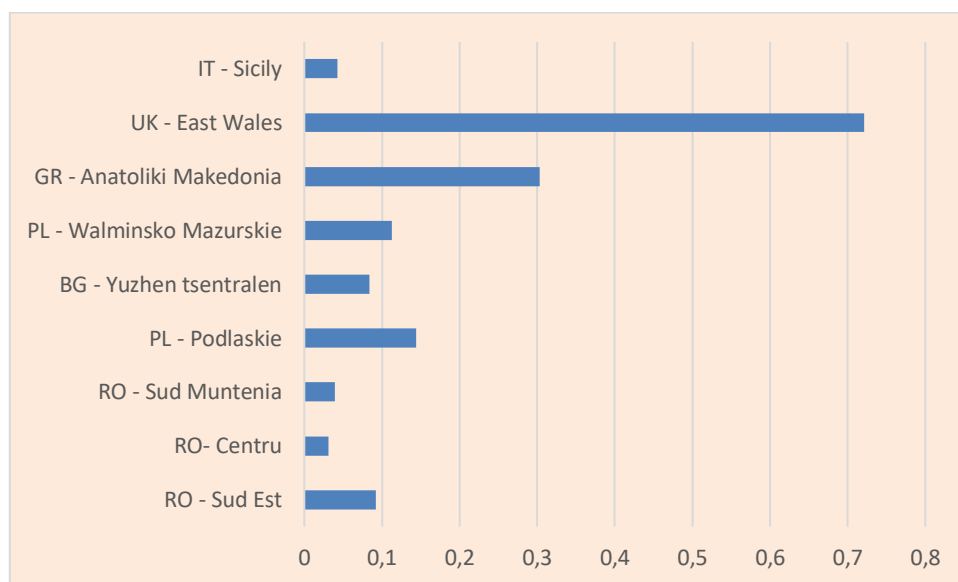
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The region having the best value is Sicily, but the performance of South East Region is high, immediately after the one of Wales and again, much higher than the other Romanian regions. While R&D appears to be lagging behind in South East Region, the innovation dynamics, especially in SMEs appear somewhat alive.

Innovating SMEs collaborating with others

When innovation becomes a matter of networking and cooperation, the difference between a British region like Wales and the other ones becomes huge. UK tradition in terms of networking and common infrastructures for SMEs innovation is well known. Although the Romanian regions present the worse values, together with Sicily, the South East Region presents a much better value than the national colleagues, even overcoming the Bulgarian value.

Figure no. 154 Innovating SMEs collaborating with others - percentage of allocated budget



Source: author data processing

Presence of a RIS3 strategy

At the moment of drafting the present Strategy for South East Region, all the other regions in the group of analysis have a RIS3 Strategy adopted for the 2014-2020 period, with the exception of the Bulgarian “Yuzhen tsentralen” region.

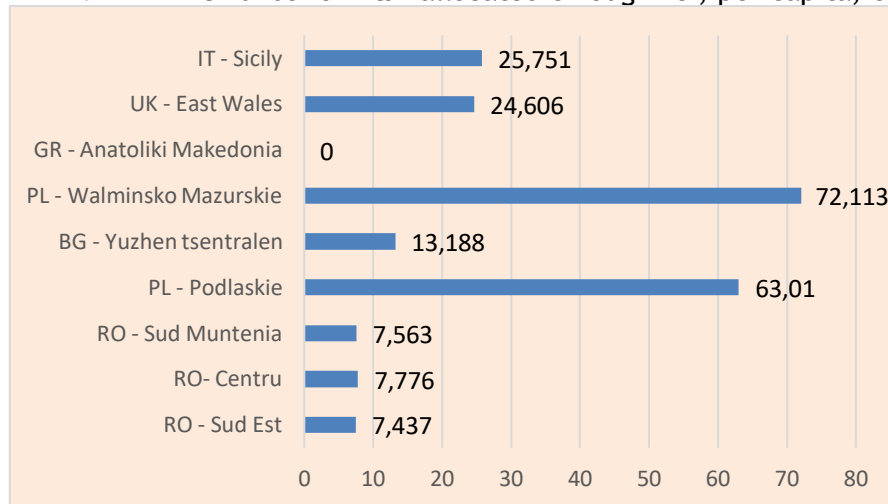
ESIF expenditure in research and development

A relevant indicator justifying the importance of the R&D and innovation for the governance system at national level is the amount of EU ESI Funds allocated for the 2 sectors.

This amount, expressed pro-capita and representing allocations for the 2014-2020 period (and not real expenditure) are monitored by the RIS3 platform through the “ESIF - viewer” application.

Data referring to the analyzed group of regions are shown in the table below:

Figure no. 155 EU funds for R&D allocated through ESI, per capita, euro



Source: author data processing

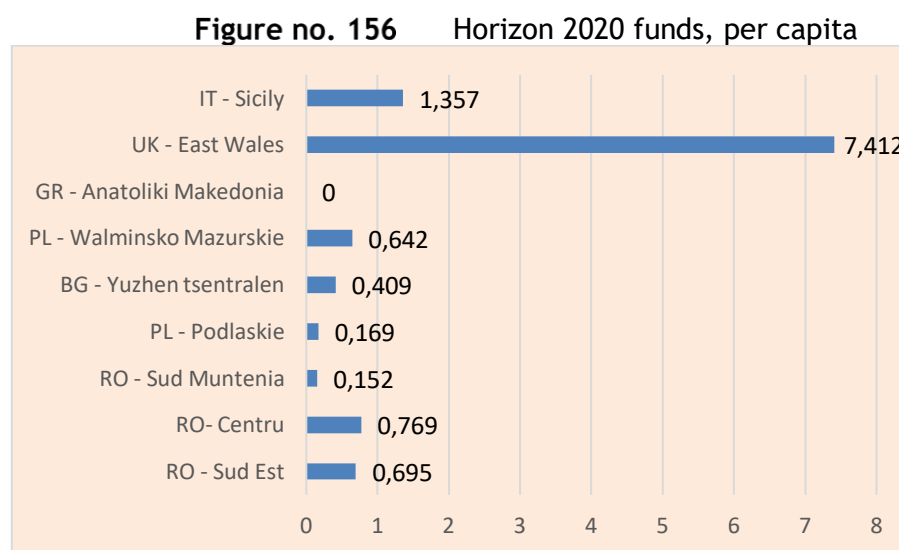
The data transmit a clear picture of the different priority given by member States (rather than regions) to R&D and innovation in the programming of ESI Funds. The allocation effort made by Poland is remarkably higher than the other countries. Romanian regions show more or less the same values, unfortunately at the bottom of the ranking. It is interesting to see how a strong innovator region like Wales doesn't need to invest huge quantities of ESI fund in research and innovation, as probably the important dynamics in these fields rely mainly on private resources.

Allocated Horizon 2020 funds

Another interesting aspect is the extent to which regions access HORIZON 2020 funds. This is still an information about public expenditure but with a meaning completely different from the one before, related to ESI Funds. While ESI Funds are pre-allocated per member state and the extent to which they are addressed to R&D and innovation depends solely by the planning strategies of governments, HORIZON 2020 funds are spent without a national pre-allocation, and their distribution on the EU territory depends basically from the rate of success of the funding application

submitted. The HORIZON 2020 allocation is an important indicator of the interest of the regional firms and public administration for R&D and innovation and their capacity to compete with the rest of Europe in obtaining funds to carry on good R&D and innovation projects.

The graph below, built on data available on the RIS3 Platform (“R&I regional viewer” tool), though with some approximation - due for example to the difficulty, in some cooperation project, to correctly identify their financial impact in each of the region concerned - presents the amount of HORIZON 2020 funds captured by the regional stakeholders, per-capita:



Source: author data processing

It's relevant to highlight the amount pro-capita of funds captured by the Wales region (more than 7 euro per inhabitant) which is more than 1/4 of the ESI funds allocated to R&D and innovation. It's like saying that a quarter of EU funding coming to Wales for this sectors depends from the merit and the ability of the territory stakeholders to compete with the rest of Europe, rather than from an allocation strategy.

The value for the South East Region is in line with the rest of the analyzed regions (apart Sicily) and interestingly higher than its polish and Bulgarian peers.

Conclusions

This simple benchmarking exercise leads to some interesting conclusions about the R&D and innovation related activities of South East Region:

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- The South East Region performs better than the other analyzed regions (I.e. without considering Wales) in non-R&D innovation expenditure, and in the in-house innovation of SMEs.
- Similar performances with those of the analyzed regions are the ones related to the cooperation among innovative SMEs and the access to Horizon 2020 funds.
- Lower performances of South East Region compared to the other analyzed regions are registered in relation to the amount of funds dedicated to R&D and innovation (both public and - dramatically - private) and in the allocation of ESI Funds to R&D and innovation, this latter situation being shared with the other Romanian regions of the group.

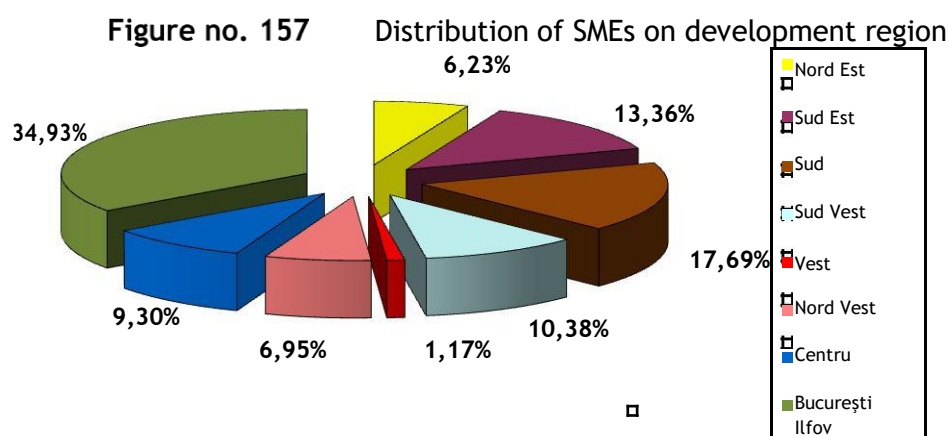
1.3. Dynamics of Entrepreneurship in the South-East Region. Areas of smart specialization

1.3.1. Features of entrepreneurship in South-East Region

The entrepreneurs represent the engine of market economy, being the main creators of economic substance and promoters of change. Due to their main contribution to the economic and social development, knowing the main features of entrepreneurship environment at the level of South-East Region has a particular importance.

In the first chapter of the Smart Specialization Strategy of South-East Region, *Analysis of regional context and innovation potential of South-East Region*, there were presented and analyzed a series of aspects related to the situation of small and medium enterprises and entrepreneurship activity, which will not be repeated in the current analysis related to entrepreneurship dynamics in South-East Region. However, there will be presented and analyzed a series of evolutions and specific indicators for entrepreneurial activities with impact on South-East Region, so as to provide a complete vision, not only in what concerns the dynamics of entrepreneurial environment, but also the innovation potential at regional level.

The distribution of small and medium enterprises on **development regions** in Romania is the following: Bucharest-Ilfov - 34,93%, South-Muntenia Region- 17,69%, South-East Region - 13,36%, South-West Oltenia Region - 10,38%, Centre Region - 9,30%, North - West Region - 6,95%, North-East Region - 6,23% and West Region - 1,17%.



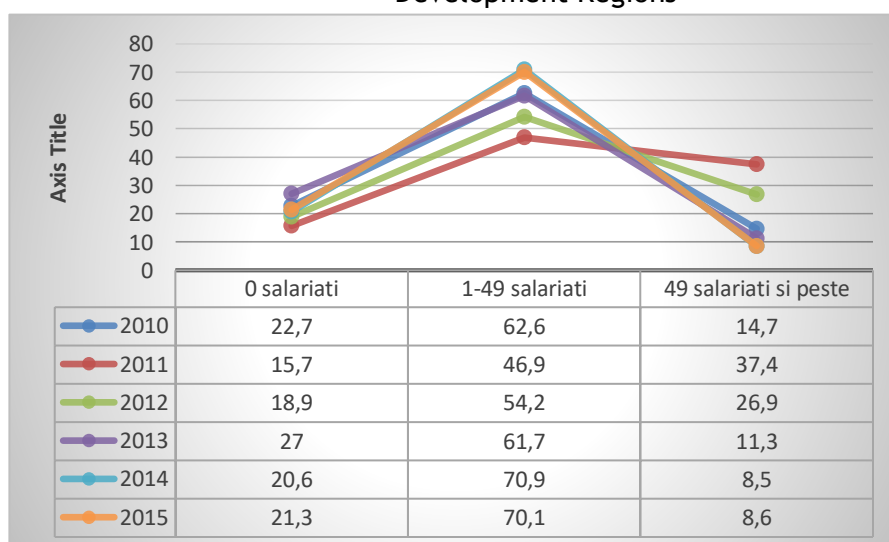
Source: *The White Charter of SMEs in Romania*, 2016

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The indicator *Distribution of new created enterprises by size classes*, highlights the fact that in 2010-2015, in South-East Region, the major share is represented by micro-enterprises without employees, their share to the total new created SMEs being significant, respectively 58,3% in 2010 and 55,7% in 2015. A similar trend is also registered in the other Development Regions of the country. In general, the owners of microenterprises with no employees prefer to develop their activity by having different collaborations, such as: hiring AFPs, their collaborators are other firms founded by those who can be employees or service providers per day. The benefits in these cases are many, being mainly related to certain tax incentives or the non-payment of contributions to the state budget (as in the case of hiring employees); for instance, in the case of service providers per day it is not necessary to sign an individual labor contract, being sufficient to register the workers per day to the Territorial Labor Institute, in the register of service providers per day. This type of collaboration is practiced in particular in the field of agriculture.

However, at the level on South-East Region, in what concerns the statistics of SMEs, it can be observed that as the lifetime of these enterprises is longer, their classification according to the size class of the number of employees changes. In other words, entrepreneurs develop and/or diversify their activities in time, which makes the need to hire additional employees more and more obvious. Thereby, in 2015, 70,1% of the SMEs registered in the South-East Region, had at least one employee and only 21,3% were micro-enterprises with no employees.

Figure no. 158 Share of the number of employees structured by size class of enterprise, on Development Regions



Source: National Institute of Statistics 2017

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The statistics highlight that in the 2010-2015 period, in a very large proportion - at least 98% of the new created firms at national level - were created through the „pure creation” method. The new created enterprises include companies and individual entrepreneurs (physical persons, individual enterprises, family enterprises, liberal professions) that develop nonagricultural activities, created in a certain period of time. The „New created” notion refers to the inclusion of an enterprise in the Enterprises Statistic Register, that is monthly updated based on the Fiscal Register.

The average number of employees in new active enterprises at the level of South-East Region registered a variation during the period 2010-2015, namely 2,5 persons (2013) and 3,7 persons (2011). Structured by types of enterprises, the companies registered higher values compared to individual entrepreneurs. This situation can be explained by the fact that in the South-East Region, over 50% of the new created enterprises can be included in the category of micro-enterprises without employees.

More than 95% of the newly established SMEs in the South-East Region perform a unique activity, the situation being similar both at the national level and at the level of the other Development Regions in Romania.

The dynamics of the entrepreneurial environment can also be analyzed with the indicator *"Share of employees number, by type of employment"*. According to the statistical data presented below, in the South-East Region, full-time employees have the largest share (depending on the type of employment), with values ranging between 44,7% (2013-2015) and 55,3% (2011) of the total number of employees working in SMEs in the South-East Region. Also, most of the SME owners in different areas of activity have the status of employee in their own company. A similar situation is also recorded at national level and can be considered as an expression of the development process of SMEs in time and of their economic and financial stability and human resources.

The analysis of statistical data highlights the fact that in the 2010-2015 period, at the level of South-East Region, the entrepreneurs were mostly independent persons, family enterprises holding a lower share. For instance, the most individual enterprises were registered at the level of South-East Region in 2014, respectively 2.366 individual enterprises, compared to 28.903 independent persons that developed a business in 2014. Compared to the other economic Development Regions, the South-East Region occupies the sixth position in what concerns the number of independent persons that started a business, respectively the fourth position in what concerns the number of family enterprises.

Galați is the county with the largest number of family enterprises created in 2015, respectively 833 private entrepreneurs. On the opposite side is placed Tulcea, with a number of 139 family enterprises created in 2015. Tulcea County also holds the last position in the ranking of South-East Region counties, depending on the number of independent persons who started a business in 2015; only 1.610 of private entrepreneurs have chosen this form. The first place in 2015 was held by Constanta County, with 8.631 private entrepreneurs working in the business environment as independent persons, with 62.51 more than in Galați County. Such a situation is also influenced by the economic, geographical and social potential of each county from South-East Region. For instance, Constanța county presents a very high tourist potential, the most private entrepreneurs being independent persons in this activity field, due to tax incentives they can benefit from. From the geographical point of view, Biosfera Deltei Dunării, a protected geographical area, occupies the largest surface, so the development potential of new businesses is much more limited than that in Constanța county.

From the perspective of entrepreneurial dynamics, the data recorded and presented in the table below highlights the "fluctuation" of SMEs in the business environment, presenting their situation one year after their establishment, the time to the end of their activity or their dissolution.

In this respect, it can be noticed that at the level of the South-East Development Region the largest share is held by the active SMEs, which at the level of 2015 represented 78,2% of the total existing SMEs. The high share of active SMEs compared to those inactive and disbanded and the situation in the other Economic Development Regions highlights the fact that private entrepreneurs develop their business with a medium and long-term vision. Among the arguments that can explain why some SMEs become inactive or abolished one year after their establishment, there may be a number of issues related to lack of sources necessary for business financing, low development opportunities or lack of workforce.

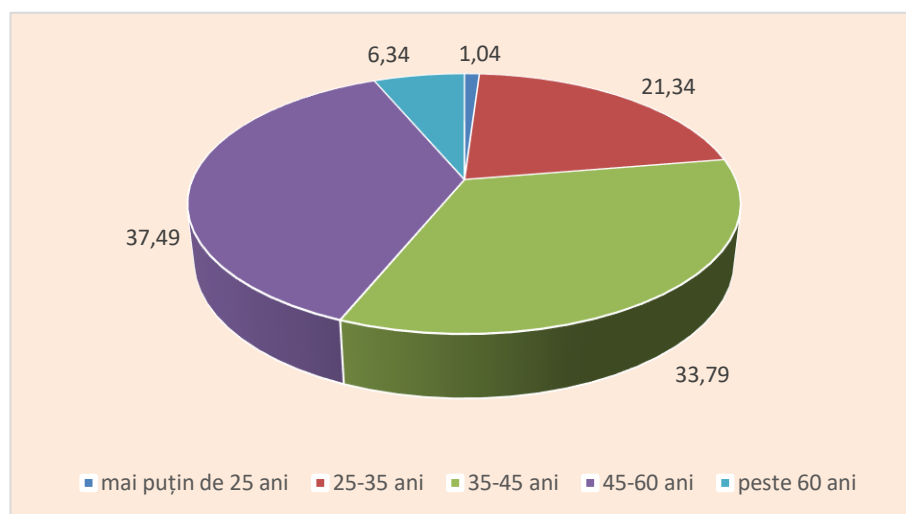
As a general trend recorded at the national level, the South-East Development Region is not the only region that during the period 2010-2015 presents a downward trend of SMEs share that invest in the first year of activity, respectively from 26,9% (2010) to 4,1% (2015). This trend is maintained at national level, presenting only in 2015 a slight increase compared to 2014 - from 11,6% to 11,9%. Among the most important causes that determine the appearance and manifestation of such behavior among entrepreneurs, there can be mentioned a series of aspects referring to the lack of financial resources and the lack of access to financial resources. It can also be mentioned that some SMEs generate resources needed for subsistence. The big share of SMEs new created in the field of

wholesale trade is other possible explanation, because the activities of wholesale trade do not require major investments.

1.3.2. The Profile of Entrepreneurs in South-East Region

At the national level, the researches of specialists highlight the fact that by **age** groups, the highest percentages are held by entrepreneurs 45-60 years (37.49%) and 35-45 years (33.79%), at the pole the opposite is the number of people under 25 (1.04%). Also, the average age of entrepreneurs is 44.43 years for the sample, 45.10 for males and 42.93 for women. Age structure is conducive to the development of the SME sector, as approximately 56% of entrepreneurs are under 45 years of age. In this context, we also mention the high share of young entrepreneurs (21.34%) aged between 25 and 35 years.

Figure no. 159 Distribution of entrepreneurs by age



Source: The White Charter of SMEs in Romania, 2016

At regional level, Bucharest-Ilfov Region has the largest percentage of founders/managers of enterprises, classified as „unskilled workers” before founding an enterprise. In 2015 it is noted a significant decrease of SMEs new created by managers who have a technical profession, compared to 2014. The most important change is recorded at the level of North-East Region, respectively a reduction from 51,2% to 12,4% from the total number of new created SMEs at the regional level in the 2014-2015 period. A possible cause of this trend is represented by the constantly decreasing number of technical schools graduates, the migration of experienced experts in other countries and

also by the fact that a part of the experts, technical school graduates are employed with individual employment contract and have not set up yet a micro-enterprise.

In what concerns the situation of owners with leading positions, it can be observed an increase of their share at the level of South-East Region in 2015 (3,4%), compared to 2014 (1,3%); a similar situation is also recorded in the Centre Region. In the category of factors that may lead to such an evolution, a number of aspects can be mentioned, such as: the surplus of resources that these people have and which they use to develop a business; the development of their entrepreneurial and taking risks spirit; set up, for example, an AFP, as a possibility to collaborate with organizations from different fields of activity and to provide different services.

From the perspective of professional training and studies, in 2015, the largest share of entrepreneurs is represented by those with secondary and university studies, respectively 55% out of the total number of entrepreneurs in Romania. The tendency is also maintained at the level of the South-East Region, with 57.5% of entrepreneurs in the region having at least secondary education.

At the national level, in 2015, 59% of managers or founders of SMEs are men and only 41% of the new created active enterprises are set up and administrated by women. At the level of South-East Region, men entrepreneurs held the largest share - 52% in 2015, and in the case of West Development Region 66,5%. Such a distribution of entrepreneurs shows a cultural orientation of Romania towards male companies.

1.3.3. Priority Areas of Smart Specialization in the South-East Development Region

In the South-East Development Region, a quantitative and qualitative analysis was carried out, which reveals the most important economic areas in terms of development potential at regional level. The methodology for selecting the fields of Smart Specialization comprises three distinct stages:

- a. *Identification of the areas with smart specialization potential, depending on the quantitative and qualitative information based on the analysis of the regional context and regional innovation potential;*
- b. *Identification of the areas with smart specialization potential based on the analysis of field research results, through the results of the surveys applied on regional business environment and regional relevant actors for smart specialization;*

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c. Consultation of key actors, relevant for the smart specialization area, through the performed focus groups.

a. Identification of the areas with smart specialization potential, depending on the quantitative and qualitative information based on the analysis of the regional context and innovation potential of region;

In this phase of analysis, the sectors with smart specialization potential were identified taking into account also the results of the performed analysis, referring to:

- Regional actives and technological infrastructures;
- Workforce at regional level;
- Entrepreneurship activity at regional level, with number of active local units, density of active local units and its distribution by field of activity, number of new created enterprises;
- Average number of employees by economic sectors;
- Performance of companies in the region;
- Investments made in the region;
- Analysis of comparative advantages of South-East Development Region;
- Analysis of research, development and innovation activity in the region - RD expenditures, situation of staff involved in RD activities, number of units involved in RD activities;
- Analysis of regional innovation activity and technological transfer;
- The clustering potential of the region;
- Analysis of intellectual property rights in South-East Development Region;
- Analysis of the competitive potential index;
- Analysis of specialization potential based on the global utility indicator;

As a result of this analysis, there were highlighted the following sectors with smart specialization potential:

- Shipping industry;
- Industrial engineering and transportation;
- Textile industry;
- Agriculture and fishing;
- Biotechnologies;
- Eco-technologies;
- ITC;

- Tourism.

b. Identification of the areas with smart specialization potential based on the analysis of field research results, through the results of the surveys applied on regional business environment and regional relevant actors for smart specialization;

The analysis of the regional context resulting from the research of the statistical data was completed with the results of a survey carried out among the key actors from South East Development Region, based on the application of a questionnaire in all the counties of the region. The collected data is representative at regional level (279 questionnaires were completed) and comprise the four components of the quadruple helix: the public sector, universities and research institutes, the private environment and civil society.

As a result of the survey performed, a set of relevant conclusions has been formulated, in order to identify the fields of smart specialization at the regional level, which will be presented in detail in Annex 3 of the present strategy.

The largest share of respondents to the questionnaires (81,3%) belongs to entities from the first part of quadruple helix, namely the entrepreneurial environment. The second category holds 8,8% of the answers, being formed by local public authorities, incubators, school inspectorates. The third category is composed of entities represented by civil societies (6,6%), containing non-governmental organizations. The fourth category holds 3,3% of the total and it contains academic and research institutions.

The answers provided by the key actors, related to the common questions of the questionnaires, show the following:

- The fields that faced best the economic crisis were: agriculture (26,06%), trade (14,98%), tourism (13,36%), IT (10,10) and shipping industry (10,10).
- The economic potential of each county is exploited in a small extent (64,0%) and very small extent (18,8%), suggesting that respondents consider that there are many possibilities for regional development.
- The areas with the highest potential, mentioned by respondents, were: agriculture (21,82%), tourism (14,42%), IT (8,16%), shipping industry (7,21%). These mentions are influenced by the county where the questionnaires were applied: in the first category are included Constanța

and Tulcea counties, where the services ranked the first position as performing domains, and in the second category are Galați, Brăila, Buzău and Vrancea counties, where the first position mentioned was agriculture.

- Competitive advantages at regional level, in the opinion of the respondents, are: geographical position (17,70%), tourism (12,87%), agricultural/fishery potential (10,34%), being positioned nearby Danube river (8,97%), fluvial/maritime potential/harbor activities (6,90%) and quality of workforce (5,29%). The way in which the competitive advantages is appreciated is influenced by the features of each county. The correlations that were made reveal that the sixth counties can be structured in three categories:
 1. Tulcea and Galati, where the first competitive advantages mentioned were: the geographical position, the Danube ports, the geographical proximity to the Danube;
 2. Constanța, where the competitive advantages mentioned were: geographic position, opening to the Black Sea, Constanța Harbor and tourism
 3. Brăila, Buzău, Vrancea, where the first competitive advantages were: the geographical position, the quality and the price of the products offered by a skilled labor force, the port industry and the proximity to the Danube. In the case of this category of counties, it is specified that the collected opinions are influenced by the opinions related to the sectors that faced the best economic crisis: services, tourism, trade and agriculture.
- In the opinion of respondents, the sectors with the highest development rate until 2020, that suggest also the intention of focusing the investments, were: agriculture (14,29%), tourism (13,80%), IT (13,80%), food industry (9,20%), trade (6,30%), constructions (5,57%), services (5,08%).

Regarding the category of respondents formed by **enterprises, young entrepreneurs, clusters, business organizations/chambers of commerce**, the most relevant conclusions of the survey highlights the following aspects:

- Most economic agents (83,5%), did not invest in research activities or developing products, although a part of them are developing businesses in areas with regional development potential. Those who have made such investments were oriented towards products development (17,31%), products and services innovation (13,46%) and increasing production capacity (11,54%).

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- The major impact of research, development and innovation investments was felt at the level of turnover, labor productivity, increasing the number of clients and penetration into new markets. A lower impact has been manifested over the profit and increasing the number of employments.
- 88,2% of respondents have mentioned that the investments in the field of research, development and innovation are insufficient, which shows the need for more intensive support for this type of activities. The causes of reduced investments in research, development and innovation activities is mainly due to the lack of funds (46,15%), lack of information (20,51%), bureaucracy (15,38%) and the lack of experts (12,82%). All these causes require specific measures to overcome them.
- The most important fields of activity for research, development and innovation sector are agriculture, services, industry, constructions and tourism. These mentions are the result of the opinions expressed by the economic agents that are currently active, but who, in 68,1% of cases, have not invested in RDI activities. Thereby, the indicated areas may result from the analogy with the current turnover and the capacity to face the economic crisis.
- The number of employees working in the RDI sector out of the companies participating in the study is very low. A percentage of 69.6% out of the total respondents have no employees in this area. Also, 76.2% of the participating agencies do not carry out research and development activities. This fact suggests an economic potential unexploited by economic entities in the region and this direction of activity involves a strategy designed to promote and support the development of this sector.
- A solution for developing a coherent strategy is developing partner networks and strengthening links between the private environment and academic and research-development institutions. At the time of this study, 90,0% of the participating companies mentioned that they had no collaboration with the academic field in order to capitalize the results obtained from the research developed in universities.
- The improvement of collaboration between economic sector and academic institutions can be achieved through associations between companies and universities (27,96%), creating laboratories (25,81%) and creating dedicated partner structures (20,43%). The low degree of information regarding research, development and innovation activities can be offset by campaigns to present the results and activities developed in this field (15,05%) and also by founding a common electronic platform at regional level to track research, development and

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innovation activities (10,75%). Considering that the main channel of information used by respondents is represented by Internet (45,5%) and mass-media (43,3%), it can be appreciated that both presentation campaigns and founding a regional platform will contribute to the exploitation of economic potential presented by research, development and innovation activities.

The answers collected from the representatives of **universities, institutions/public and private research bodies, scientific and technological parks, technology transfer entities** from South-East Region have led the following conclusions:

- The analysis of collected responses and institutions framed in this category shows there is no specialized activity in the field. Universities are the main pillar of development of this area in the region.
- The most successful areas in research, development and innovation activities were, according to the respondents, engineering, electronics and telecommunications.
- Only 1,5% of respondents used laboratories and stations for development research, although half of them benefited from research projects to create products and services for the economic market and 25,0% benefited from grants with the same purpose.
- The correlations performed have revealed a significant link between the units which have used laboratories or own stations and the number of patents and licenses recorded, what suggests that the results of such research appear in conditions of sufficient technical infrastructure.

The questionnaires applied to **local public authorities** have revealed the following aspects:

- Most respondents (77,8%) are institutions that have not concluded any public-private partnerships.
- The strengths of the communities represented by respondents are agricultural lands, geographical location factors (proximity to Danube river or Black Sea), quality of workforce or touristic potential. The weaknesses are related to road infrastructure, lack of investors, lack of jobs and demographic decline (low birth rates, emigration and the aging of the population).

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- The institutions that can contribute to the development of the counties are, in the order resulting from the processing of responses, the following: business environment (38,24%), county councils (26,47%), universities (8,82%) and local councils (5,88%).
- The development directions at county level are: agriculture (24,39%), development of infrastructure (12,20%), development of shipping sector (7,32%) and services (7,32%).

The respondents that belong to **civil societies** have noted the following items:

- The areas to which the activity of civil societies representatives should be directed are development of technologies, IT, agro industry, entrepreneurship, local economic development, vocational trainings of adults and technological information.
- Areas of future in regional development, in the vision of civil societies representatives, are: IT (16,00%), TIC (12,00%) and tourism (12,00%). It is found that the first domains in the hierarchy come from the tertiary sector, being characterized by a superior productivity.
- Half of institutions represented in this study had signed partnerships between public and private sector. More than a half (56,3%) did not get any grant or research project, although they mentioned that their objective and mission are to support innovation.
- Representatives of this category of respondents mentioned that their main directions of action for development are: agro-food sector, improvement of transport network and hydrographic networks.

Based on the collection and processing of information resulted from performing the survey at regional level, it is noted that the fields with the highest development potential in the South-East Development Region, are: agriculture, tourism, IT, shipping industry, food industry, constructions, engineering, electronics and telecommunications.

c. Consultation of key actors, relevant for the smart specialization area, through the performed focus groups.

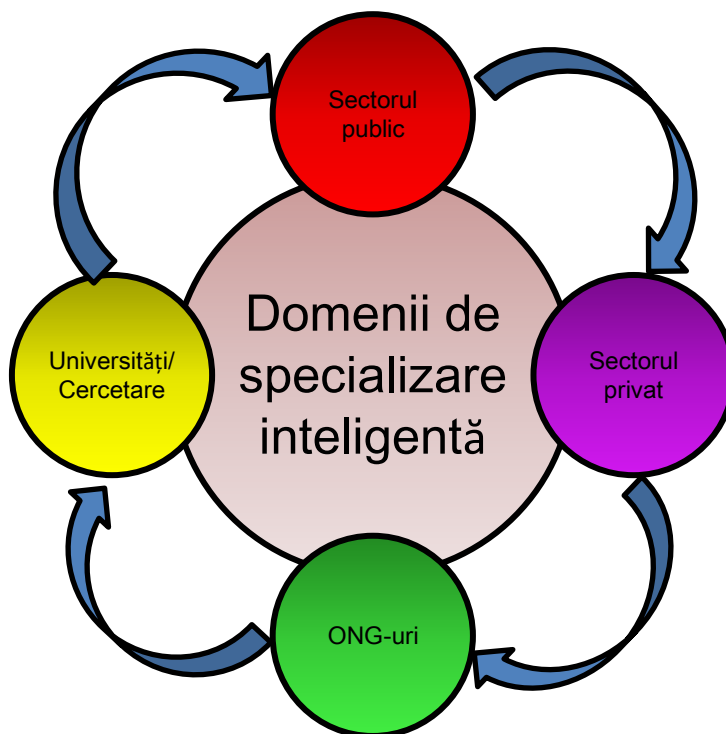
In order to complete the quantitative analysis performed for the study, there were organized 7 focus groups with the participation of relevant actors in the region, which belong to the quadruple helix: public sector, private sector, NGOs and universities.

Focus groups were organized in the form of entrepreneurial discovery meetings, being carried out on the areas of smart specialization identified at the regional level. The role of these meetings was to identify the challenges that exist in each area of specialization in the Southeast Development

Region, as well as to reflect on how to address the identified challenges in order to be aligned with RIS3.

Each themed Focus Group has reunited participants of the whole quadruple helix (public authorities, business environment, universities, NGOs).

Figure no. 160 Representatives of quadruple helix selected to establish the domains of smart specialization



Focus groups were organized on smart specialization areas, as follows:

- Focus Group Brăila. Domain: Biotechnologies. Subdomains:
 - o Environment biotechnologies;
 - o Agro-food biotechnologies.
- Focus Group Galați. Domain: Information and Communication Technology industry (ICT). Subdomains:
 - o Electronic engineering and telecommunication;
 - o New media.
- Focus Group Galați. Domain: Shipping. Subdomains:
 - o Ship building;

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- Ship transports.
- Focus Group Constanța: Domain: Tourism. Subdomains:
 - Traditional tourism;
 - Niche tourism.
- Focus Group Constanța: Domain: Ecotechnologies. Subdomains:
 - New generations of vehicles and ecological technologies and energy efficient
 - Equipment for the production of bio resources
 - Technologies, equipment and technical systems for the production of bio resources
 - Depollution technologies
- Focus Group Focșani. Domain: Textile industry. Subdomains:
 - Technology of textiles;
 - Advanced biomaterials.
- Focus Group Buzău. Domain: Metallurgical industry.

As a result of developing the Focus Groups, at the proposal of the local actors involved, it was decided to reformulate and complete some of the domains initially identified. Thereby, the smart specialization domains identified for the South-East Development Region, will be:

- **Engineering and shipping transport:**
 - Construction and reparation of ships;
 - Shipping transport;
- **Clothing industry;**
- **Agro-food industry and fishery:**
- **Biotechnologies:**
 - Agro-food biotechnologies;
 - Environment biotechnologies;
- **Eco-technologies:**
 - Ecological technologies and energy efficient;
 - Equipment for the production of bio resources;
- **Tourism:**
 - Traditional tourism (seaside tourism, Danube Delta tourism, mountain tourism, etc);
 - Balnear tourism;
 - Niche tourism.
- **ICT, High Tech, Nanotechnologies and Advanced Materials.**

We mention that the domain of „textiles industry”, identified as a result of regional context analysis, has been renamed as „clothing industry”, according to the recommendations formulated by the participants in the focus group organized in this field and also to truly represent the reality of this domain in the region, which is mainly focused on clothing side.

As well, as a result of organizing the Focus Group having as a theme the „metallurgical industry”, it was concluded that this domain can not be proposed as specialization domain at the regional level, considering the low representativeness at the level of region economy and the limited existence of smart specialization potential in this field.

The detailed conclusions and the justification of changing the name of some smart specialization domains, as a result of organizing the Focus Group structured on the 7 priority areas, are presented briefly in Annex no. 4 of the present strategy.

Selection of smart specialization domains

The identification of the domains with smart specialization potential was realized as a result of centralizing the quantitative and qualitative information, derived from the analysis of regional context and the innovation potential of the region, the information obtained from the surveys applied to the key regional actors for smart specialization, and also from the information obtained within the focus groups.

Thus, the smart specialization domains identified for South-East Development Region are:

- **Engineering and shipping transport:**
 - o Construction and reparation of ships;
 - o Shipping transport;
- **Clothing industry;**
- **Agro-food industry and fishery:**
- **Biotechnologies:**
 - o Agro-food biotechnologies;
 - o Environmental biotechnologies;
- **Eco-technologies:**
 - o Ecological technologies and energy efficient;
 - o Equipment for the production of bio resources;

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- **Tourism:**
 - o Traditional tourism (seaside tourism, Danube Delta tourism, mountain tourism, etc);
 - o Balnear tourism;
 - o Niche tourism.
- **TIC, High Tech, Nanotechnologies and advanced Materials.**

The domains selected as having development potential at the level of South-East Region are presented briefly below, while highlighting their potential for smart specialization, as well as the reasons why these areas and sub-areas were included within the Smart Specialization Strategy of the South East Development Region.

1.3.3.1. Engineering and shipping transport

- o **Construction and reparation of ships;**
- o **Shipping transport;**

Shipping industry represents a domain of specialization representative for the South-East Development Region, in particular due to the geographic position of counties Constanța, Galați and Tulcea, but also due to the existence of a tradition in the field of ship building and ship repair in the region. On the other hand, naval engineering has also developed due to the fact that the area has increased attractiveness for foreign direct investment, as well as the fact that there is an increased capacity to attract European funds and to implement projects in the naval field.

According to Free Trade Union of Seafarers, in 2015 were recorded 33.000 patents and certificates in Romania, 21.000 seafarers in navigation safety system, out of which 14.600 active seafarers and 12.000 auxiliary staff. Also, the data published by the Ministry of Finance shows that at the level of year 2015, the top 8 shipyards of the country have recorded revenues of 4.405.408.750 RON. Also in 2015, the companies in the shipping industry have recorded significant revenue increases, compared to previous year, which demonstrated the upward trend of industry and the great potential of development (Daewoo Mangalia Heavy Industries (+112%), Shipyard of Constanța (+82,50%)). For instance, according to the report drafted by leading council of Free Trade Union of Seafarers, Constanța Shipyard has repaired 94 ships for foreign beneficiaries and 20 ships for Romanian beneficiaries in 2016. Moreover, the production capacities for 2017-2018 period are covered by works in proportion of 100%, the company signing the contract for the construction of six chemical tanks of 41,000 tdw.

a. The sub-domain of construction and reparation of ships was selected as domain of smart specialization considering the following arguments:

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- The industry of ship construction in Romania has an important position for European industry, the ships provided by Romanian shipyards representing about 5% of the total European production;
- The Romanian shipyards are the main destination for outsourcing of ship production;
- The turnover recorded by Romanian shipyards is about 650 million EUR annually;
- The ship industry represents a vector of development for South-East Development Region;
- At the regional level, there are education and research institutions in the field of ship industry;
- The existence of ANCONAV Association, member of SEA Europe Association;
- The comparative advantage of the region (analyzed using the Revealed Export Advantage) in what concerns the category of products 89. Ships and floating structures.

This sub-domain comprises:

- construction of commercial ships: passenger ships, ferry-boats, cargo ships, tanks (maritime and riverine), tug-boats etc.
- construction of war ships;
- construction of ships for fishery and fish processing (factory-ships).

Several shipyards are operating at the level of South East Development Regions, such as Constanța Shipyard, Damen Shipyards Galați, Daewoo-Mangalia Heavy Industries, Midia Shipyard, Vard Braila, Vard Tulcea.

Besides the construction of ships, in the shipyards of South-East Development Region are performed *reparation activities* for different types of ships, activities that contribute to the economic growth of the region. There can be mentioned the following repair services:

- repairs of propelled and non-propelled ships;
- diagnosis and technical solutions;
- repairs and reconditioning for ship parts and equipment;
- technical interventions for ships in different locations of Romanian sector of Danube;
- repairs of propelled and generators engines of ships;
- repairs of mechanical installations on board;

The existing infrastructure related to ships reparation is one of the strengths of the region. The infrastructure allows the development of shipping industry, increasing the number of jobs in the field, respectively the development of related industries. There are several entities in the region

that provide ships reparation services, such as: Navrom Shipyard SRL, Ship Repair Base Brăila, S.C. 2x1 HOLDING CAPE MIDIA SHIPYARD S.A., S.C. AKER S.A., S.C. ARGOS S.A., S.C. SHIPYARD "DAMEN" GALATI S.A., S.C. SHIPYARD MANGALIA S.A., S.C. SHIPYARD CONSTANTA S.A., S.C. SORENA S.A, S.C. UTILNAVOREP S.A.

b. The sub-domain of *shipping transport* is strongly related to the sub-domain of ship construction, but also to the harbor infrastructure existing in the region. There are several big harbors in South-East Development Region, such as: Constanța Harbor, Tomis Harbor, Brăila Harbor, Galați and Tulcea Harbor, Mangalia Harbor. The complete list of harbors existing in South-East Development Region is presented below and it can be also analyzed in the table of annexes.

- Constanța, maritime harbor;
- Midia, maritime harbor;
- Mangalia, maritime harbor;
- Galați, riverine-maritime harbor;
- Brăila, riverine-maritime harbor;
- Tulcea, riverine-maritime harbor;
- Cernavodă, riverine harbor;
- Hârșova, riverine harbor;
- Chișcani, riverine harbor;
- Isaccea, riverine harbor;
- Sulina, riverine harbor;
- Turcoaia, inner harbor;
- Gura Arman, inner harbor;
- Măcin, inner harbor;
- Chilia Veche, inner harbor;
- Mahmudia, inner harbor;
- Sfântu Gheorghe, inner harbor;
- Medgidia, inner harbor;
- Murfatlar, previously named Basarabi, inner harbor;
- Ovidiu, inner harbor;
- Luminița, inner harbor.

The main activities of shipping transport in the region are:

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- maritime or riverine public transport of persons and/or goods, carried out by legal persons;
- transport of persons and/or goods on national waterways for own use, as secondary activity for other economic activity, carried out by legal or individual persons, the good transported being their property or the result for their activity, and the persons transported being their employees;
- transport of goods and/or persons on national waterways in own interest, carried out by individuals, in order to satisfy their own requirements on water transport, sport or recreation;
- activities related to shipping transport activity.

In what follows, there are presented several examples of innovation and smart specialization directions that are opportune for developing and enhancing the competitiveness in the field of engineering and shipping transport:

- Digitizing of some shipping transport activities;
- Digitizing of some harbor activities;
- Innovative projects to reduce pollution caused by harbor activity;
- Use of industrial robots for replacing the classic welding formula in the shipyard perimeter;
- Projects for preventing the transfer of contaminated liquid;
- Use of engines based on liquefied natural gas, in order to protect the environment;
- Use of unconventional materials in construction of ships (de ex. Buckypaper).

1.3.3.2. Clothing (textile) industry

The 9.700 companies in the Romanian textiles industry have over 250.000 employees and 70% of the production is sold in Lohn policy, according to the data provided by employers' federation in the field. It means that 70% of the clothes produced in Romania are sold in the stores of major brands around the world.

According to the patronages, this collaboration has been changed in a good way over time. In the '90s, the owners of big brands wanted to take advantage only of the Romanian labor force. Since the textiles factories here did not have well-established networks with providers, the foreigners brought all the raw materials in Romania, from fabrics and labels to accessories, and the Romanian employers only turned them into clothes. Now, the factories only receive the labels from the big companies for which they work. The Romanian entrepreneurs in textile industry buy the fabrics from their own providers from the country or abroad.

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Now the industry is more integrated and its impact on the economy is bigger compared to the last 20 years, considering also that the exports of Romanian factories to foreign clothes stores has increased very much, reaching 5,7 billion euros in 2016.

The largest share was held by exports of clothes, which reached three billion euros in 2016, while the exports of leather products have led to earnings of 1,6 billion euros and 1,1 billion euros from clothing.

The owners of factories activating in this sector say that if the auto industry is separated in the machinery industry and the component manufacturing industry, then the textiles industry is Romania's biggest exporter.

However, factories operating in the fashion sector have different specializations. Almost 6.000 of the factories produce clothes, 2.000 deal with leather goods and 1.900 deal with clothing, according to patronages' data.

Weakened by major transformations due to the globalization and the shocks of demand during the financial crisis, clothing industry was ranked in the average risk class. At European level, the clothing industry remains competitive, despite the low-cost products from developing countries, but the true key to success consists of innovation. The struggle for survival has forced many companies to invest in textile products in particular, addressed to industrial use, that belong in general to niche markets.

The smart development of textile and clothing industry in South-East Region, in the next period, has to consider a strategic reorientation by shifting emphasis from high volume production and lower added value, to a production based on innovation and in the same time to be able to stimulate the development of creation and design and the use of new fabrics. A better organization of economic actors, including through formation and development of clusters in this sector, would favor the transition to a higher qualitative phase and allow the maintaining of textile and clothing industry among the competitive sectors through innovation.

1.3.3.3. Industry of agro-food and fishery

By tradition, the South-East Region is an agricultural area. The pedoclimatic conditions in the region favor the cultivation of corn (especially in the northern area), wheat (in the central area of the region), barley, industrial plants and sunflower.

a. Agro-food sub-domain:

Agriculture has an important share in the regional economy, the agricultural production being significant. The region is ranked first in the country in what concerns the surface of the fruitful vineyards. The fishery and aquaculture, alongside fish processing and trade of fish and fish products, are traditional activities in South-East Region.

In terms of participation in the main economic activities, the share of the employed civilian population in agriculture is 28,3%, while the share of the employed civil service population is prevailing (43%) and in industry and construction is 28.4%

Statistical data show that Buzau County is the county with the largest number of persons employed in agriculture, compared to the other counties in the South-East Region, about 22,3% of the total active population working in agriculture at the level of the region being registered in Buzau County.

At national level, more than 7.000 companies, with over 40.000 employees, are currently working in agriculture, on grains cultivation segment.

Romania has become the main grains exporter in the European Union, according to data provided in May. Romanian companies exported 7,15 million tons, almost a quarter of total European grain exports from the 2016-2017 harvest.

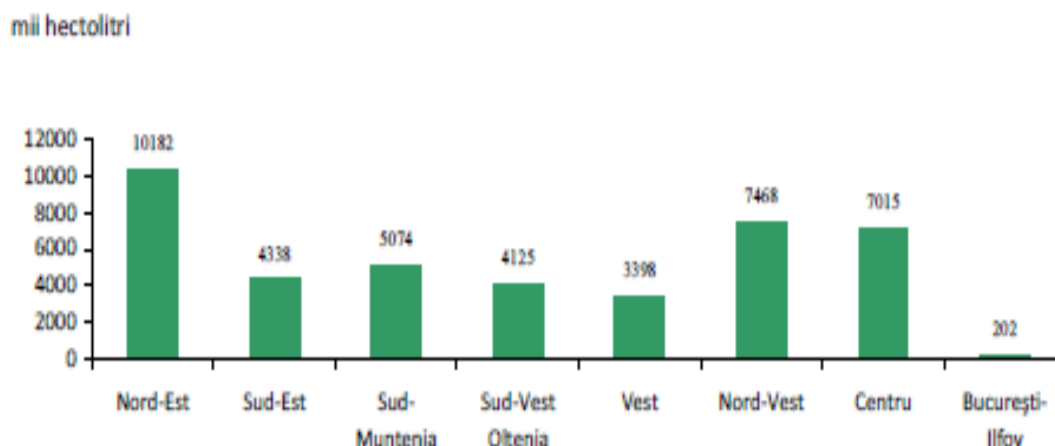
At national level, in 2015, the share of vegetable agricultural production in South-East Region was 3.471.684 thousand RON, approximately 85,73% of the total agricultural production, while the animal production held only 14,27 %. At the level of South-East Region, Buzău, Constanța and Brăila recorded the largest share of vegetable agricultural production, respectively over 56% of the total vegetable production of the region. In what concerns the animal production, in 2015, the counties Buzău and Vrancea recorded the highest values of animal production, summing about 42,79 % of the total.

According to the statistical data presented in the annex table, at the level of the South-East Development Region, there is an increase in the number of cattle by 0,59% in 2015, compared to 2010. Regarding the production of pigs, it recorded a decrease during 2010-2015 by 135.340 heads, compared to 907.434 registered in 2010. The trend is also maintained at the level of the private sector, being registered a decrease of 14,7% in 2015, compared to 2010. Adult poultry and adult chickens registered an increases in 2015 compared to 2010.

Comparing the year 2016 with the year 2015, it is noticed that in the structure of meat production were recorded increases related to the share of pork meat production (+0,9 percentage points),

beef production (+0,1 pp) and sheep and goat meat (+0,1 pp) and decreases related to the share of the poultry meat production (- 1,1 pp).

Figure no. 161 Cow milk production in 2016, by development regions



The total production of cow milk (including the consumption of calves) in 2016 was 41.802 thousand hectoliters, with 600 thousand hectoliters less than the level of the previous year (-1,4%). It were recorded decreases in the North-East Development Region (-4,3%), North-West (-4,3%), South West-Oltenia (-1,4%) and South-East (-1,1%) and increases in București- Ilfov Development Region (+11,0%), West (+4,4%), South Muntenia (+2,4%) and Center (+0,2%).

The agricultural corps represent the main feature of the region, ranking the first place in 2015 in the production of legumes for beans, peas, textile plants, olives, sunflower, vegetables, tomatoes, grapes and second place nationwide in cereal grain production. The South-East Region ranks the first place in the country in what concerns the surface of the fruitful vineyards, owning 41,2% of the country's wine-growing area (only Vrancea County owns over 14% of the country's wine area). The South-East Region is recognized both internally and externally by the quality of wines from well-known vineyards, which are found throughout the region: Panciu, Odobești, Pietroasele, Nicorești, Niculițel, Murfatlar, Oșurăței.

The largest surface of vineyards is located in South-East Development Region (76,2%), followed at a major distance by West Development Region and South-Muntenia Development Region, according to the data published by National Institute of Statistics (NIS).

Romania is one of the countries with tradition in the culture of vine, the climate and soil conditions of the country being favorable for this culture. The surface which is cultivated with vines represents the surface occupied with vines for production of grapes. This surface comprises both the fruitful and early unfruitful vineyards.

Fishery and aquaculture, along with fish processing and trade of fish and fish products, are activities undertaken all over the country. In some isolated areas, as Delta and Danube Meadow or Danube Climb, the fishery represents one of the main activities that provide jobs and sources of income for the local population.

b. The fisheries sector in South-East Region includes:

- Fishing activities in Black Sea, practiced along the Romanian seaside.

Since 1986, Romania has unilaterally declared The Exclusive Economic Area (EEA) at Black Sea, whose surface is about 25.000 square kilometers, along with the other riparian countries. At present, according to the provisions of UNO Convention on the rights of seaside, the fishing area of the Black Sea in Romania is not yet delimited. Such being the case, the Romanian fishing vessels are fishing, usually, up to 30-35 nautical miles off shore "207. Romania's fishing fleet is naturally entirely concentrated in the South East Region and consists of 437 ships, totaling 6936 kw and 1852 GT (2008). 416 of these ships are small sized, with an average age of 15 years. In many cases, being equipped with low power engines, the ships are used for small-scale coastal fishing and they are generally in a degraded state of deterioration, requiring interventions to improve safety and working conditions. Only 21 fishing ships (5%) have a length of more than 12 meters. Most of the vessels are of the same type, built in the 80's, being about 25 meters. Vessels have outdated equipment and installations, do not offer safe operation and do not meet current requirements, not having ice and storage facilities. With no specialized fishery ports in Romania, fishing vessels are using trade harbors - Constanța, Mangalia, Sulina - as landing ports, which do not provide specific fishing facilities. The size and the state of the fleet, along with the lack of an appropriate supporting infrastructure limit the exploitation capacity of existing fish stocks.

- fishing activities in inland waters, which are practiced on the Danube, as well as in the Danube Delta area use small wooden boats and do not have mechanized means. In the inland waters, fishing is regulated based on licenses and is practiced in particular as main activity by professional fishermen. In some cases, it is a means of subsistence for people who do not have enough income from other activities. There are 36 landing places in the

Danube Delta, out of which only 16 meet the sanitary-veterinary standards, and the rest must be upgraded and equipped.

- Aquaculture. There are 129 fish farms in South-East Region, recorded in the Register of Aquaculture Units, out of which 39 are seed beds and 90 lofts. The highest number of fish farms is located in Tulcea county (54) and Constanța county (34).

In the coastal zone of Romania, one of the oldest activities is fishing. This activity is mainly carried out in the northern half of the Romanian seaside, where is concentrated the fishing of sturgeons and Danube bloaters; in the southern part prevails the artisanal fishing, due to the guvuds populations in the rocky ridge area. In the coastal area of Romanian seaside, fishing activity is developed in 3 ways: using fixed gear (in Agigea, Eforie Nord, Eforie Sud, Tuzla, Costinești, 23 August, Mangalia), using mobile gears (fishing vessels) and craft fishery made by local fishing communities.

In Romania, static and mobile fishing takes place along the Romanian seaside and in the marine areas up to the 60m isobath, due to the limited characteristics and autonomy of fishing vessels. Trawler fishing is seasonal, depending on the presence of fish in these areas.

An important fishing area is the marine area of the Danube Delta Biosphere Reserve, but this area is prohibited for trawler vessels. Besides this area, in the rest of the Romanian seaside, the area up to 20 m deep is also forbidden for the activity of fishing vessels using towed gear, being allowed only fishing with stationary and filtering gear.

1.3.3.4. Biotechnologies

- **Agri-food biotechnologies;**
- **Environmental biotechnologies;**

Biotechnology deals with the use of micro-organisms or derivatives for the production of substances useful in agriculture, food industry and pharmaceutical industry.

European Union's biotech industry spends approximately 7,32 billion euros annually for research-development-innovation activities and it generates incomes of almost 23,2 billion euros.

According to European Federation of Biotechnologies (EFB), biotechnology consists of natural sciences and engineering, combined in order to use organisms, cells, molecules, parts or molecular analogues thereof to obtain products or products and to provide services.

Biotechnologies are a field of research and production with spectacular dynamics. Some of the exceptional achievements of recent years such as deciphering human genotyping and cloning in animals and humans are suggestive. The benefits of biotechnologies are still insufficiently exploited. All the scientist agree with the huge benefits that human society can benefit from. For this reason, the biotechnology domain, which is still placed at the frontiers of knowledge, is required abroad and lately in our country³⁰.

Biotechnologies ensure a rapid diversification and growth in terms of needs of food, energy, and pharmacologically active compounds through the biodegradation of organic waste, with a significant long-term impact on the quality of life and environmental protection.

The main objective of biotechnologies is the development of biotechnological methods, means and products for increasing the quality and quantity of bio resources in the context of climate change and the growing demand for quality food.

Choosing the field of biotechnology as a field of smart specialization at the level of the South-East Development Region is justified by the huge agricultural potential of the region, but also by the need to develop bio resources and to protect the environment. Also, at the level of the universities and research institutes present in the region, several research projects have been implemented in the field of biotechnologies related to invasive species monitoring systems, research and technological development for obtaining ecological insecticides, chemical and biochemical analysis of soil greenhouse gases, removing excess iron and copper ion from wine through reverse osmosis membranes, evaluation and prognosis of evolution of the agroecological potential of the Romanian Plain and Dobrogea fields for the conservation and sustainable management of soil and water resources, etc.

The increased interest in the region for research-development and innovation activities in the field of biotechnologies is also supported by conducting scientific events dedicated to biotechnologies, such as the conference “Modern Biotechnologies in Sustainable Development of the Danube Delta” organized by the National Institute for Research and Development of Biological Sciences from Bucharest (NIRDBSB), which took places in Tulcea in 2016.

- a. **The Sub-domain of agri-food biotechnologies** was chosen as a smart specialization domain, based on the following arguments:

³⁰ USAMVBT, http://www.usab-tm.ro/USAMVBT_Biotehnologii-agricole_ro_1040.html

- the agri-food biotechnologies contribute to the conservation of natural resources, the reduction of CO2 emissions, the improvement of soil quality and high productivity;
- agri-food biotechnologies can provide products with increased quality and safety in conditions of more efficient use of resources and environmental protection;
- the economic contribution of biotechnology in agriculture, at the level of EU, is 36%;
- the use of biotechnologies for the year 2030 is estimated to be about 50% of the agricultural production.

More than that, the South-East Development Region has a huge agricultural surface, a great quality of agricultural lands, resorts and research institutes in the agricultural field and the potential of clustering in the agricultural field.

- b. **The Sub-domain of environmental biotechnologies** offers the benefits of using combinations of selected microorganisms for their synergistic capabilities to improve water, soil and air quality. The use of these techniques at the ecological system level consists of the optimization of some methods of implantation and use of specialized living structures, from microbes to plants and fish, to improve the quality of water, soil and air³¹.

The Sub-domain of environmental biotechnologies was chosen as smart specialization domain, at the level of the region, because:

- Environmental biotechnologies are effective in sustainable development based on pollution reduction;
- Pollution is a global and regional challenge;
- Waste management is based on three principles: collection, recycling and reuse for value-added products;
- Biodiversity must be preserved by biotechnology;
- There is a great biodiversity in the region;
- There is a great potential for clustering in the field of environmental protection;
- Higher use of biodegradable waste and by-products through biotechnological processes can increase welfare in the region by creating new jobs, improved living conditions.

Some examples of directions for smart specialization and innovation, which are appropriate for developing and enhancing the competitiveness in the field of biotechnology are presented below:

- Soil management projects wrecked by environmental biotechnology;
- Economic recovery of waste;

³¹ Dabu, C.M.

- Use of natural fertilizers in agriculture;
- Increasing the quality of wines through the use and development of indigenous biotechnologies;
- Innovative projects for conservation of useful entomophagous in wine-growing vineyards;
- Improving the quality of soils for the most natural agricultural food products;
- Improving the quality of soils for the most natural agricultural food products;
- Research and development of high-energy biofuels as an alternative to fossil fuels;
- Bioenergy production - biogas, biomass, biofuel;
- Production of auxiliary sources of energy based on organic waste from agriculture, forestry, zootechnics, food industry etc.
- Development of systems and models of microbiological degradation of pollutants.

1.3.3.5. Eco-technologies

- **Ecological and energy-efficient technologies;**
- **Equipment for the production of bioresources;**

Ecotechnology is a harmonious blend of technology and environmental protection. Ecotechnology is the science of applying science that studies all the transformations to which the primary substance is subjected in order to obtain goods of a certain social utility and in the conditions of sustainable development³². Developing ecotechnologies at the level of the South East Development Region can be a viable solution to tackle key environmental issues, helping to protect and preserve it, and to make better use of scarce resources.

a. Ecological and energy efficient technologies

The arguments used for establishing the field of ecotechnologies as a field of smart specialization in the South-East Region are:

- The measures taken in Paris and Graz for the energy sector to reduce global warming are completely missing from the Romanian Energy Strategy project;
- Ecotechnologies are a high added value domain;
- Ecotechnologies observe the environment and subscribe to its sustainability;
- The need to capitalize already started projects in the field of ecotechnologies.

³² Asociația Generală a Inginerilor din România

At the level of the South-East Development Region, the Danube Delta National Research and Development Institute - INCDDD Tulcea, has as main activity research and development related to the structure, evolution, functioning and modeling of ecosystems, the sustainable use of biological resources, and reduction of anthropogenic impact, ecosystem restoration, ecological reconstruction, etc. Also, the National Institute for Research and Development for Marine Research "Grigore Antipa" - INCDM Constanta operates, with concerns in the field of marine ecology and protection, technologies and solutions for the prevention of coastal erosion, etc. These institutes, together with research resorts and universities in the region, may propose ecotechnologies in the future to develop the region while protecting the environment.

b. Equipment for the production of bioresources

The South-East Development Region has a great potential for innovation in renewable energy. These are considered to be energies from sources that either regenerate themselves shortly or are inexhaustible sources.

Renewable energy sources include wind energy, solar energy, water energy, geothermal energy, biomass energy.

Nowadays, there are 80 wind farms in Romania, according to Transelectica, most of them in the South East Development Region. The total amount of wind power supplied by the grid in 2015 was 7.04 Twh. On January 1 st, 2017, Romania recorded 3.025 MW of wind power, which represents investments of over 5 billion euros.

The main companies producing and delivering electricity from wind farms in the region are CEZ - Cehia, Energias de Portugal, Enel Green Power, Monsson, Energy Group (Monsson), OMV Petrom, NEGBerlin, EP Global Energy. Most location are in Dobrogea: Fântânele; Cogealac; Peștera; Cernavodă; Sarichioi; Corugea; Sălbatica; Agighiol; Baia; Siliștea; Gălbiori; Mireasa; Dorobanțu; Mihai Viteazu; Pantelimon; Biruința; Ciocârlia; Chirnogeni.

There is also a potential to develop eco-technologies to produce biomass energy in the region. Biomass is the biodegradable fraction of products, waste and residues from agriculture, including vegetal and animal substances, forestry and related industries, and the biodegradable fraction of industrial and urban waste. Biomass is the most abundant renewable resource on the planet. This includes absolutely all organic matter produced by the metabolic processes of living organisms. Biomass is the first form of energy used by humans, with the discovery of fire.

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Some examples of directions for innovation and smart specialization, which are opportune for the development and increase of competitiveness in the field of ecotechnologies, are presented below:

- Developing environmental protection technologies;
- Increasing the quality and reliability of equipment, machinery, installations used in agriculture and industry;
- Developing innovative technologies, equipment and systems for the production of food and non-food bioresources;
- Developing alternative power generation systems;
- Identification of marine resources usable in eco / bio-technologies;
- Capitalization of solar energy;
- New generations of vehicles based on eco / bio technologies.

1.3.3.6.Tourism:

- **Traditional tourism (maritime tourism, Danube tourism, mountain tourism, etc);**
- **Balnear tourism;**
- **Niche tourism.**

Tourism has become an extremely dynamic service that needs to adapt to changing economic environment, changing consumer behavior and demands, structural changes in the economy and employment, and, last but not least, the perspective of European integration.

A feature of South East Development Region is represented by the high tourism potential.

The Southeast Region comprises almost all forms of relief: the Danube Plain, the Baragan Plateau, the Dobrogea Plateau with the Măcin Mountains, and the north-western part of the region comprises a part of the Carpathians and the Curb Subcarpathians.

At the same time, the region is crossed by the Danube River, it includes the Danube Delta and is bordered to the east by the entire Romanian Black Sea seaside. However, the plain is continental, with a continental climate. In the South-East Region there are natural lakes with therapeutic properties, mud volcanoes, the Danube Delta Reserve, the Small Island of Braila and the Black Sea coast.

In the Soveja - Lepşa area of Vrancea, besides a picturesque scenery, there is an unpolluted air with a high ozone concentration. The region concentrates one third of the country's tourist reception facilities. The net occupancy rate index remains high compared to the national and regional levels. At national level, the average net use index of the accommodation capacity was 29,7% in the year

2015, at Constanta County the value of this indicator was 39,9%. At the level of Tulcea County, this indicator registered a value of 28,1%.

a. Traditional tourism (maritime tourism, Danube tourism, mountain tourism, etc);

The best represented sector is seaside tourism, the Black Sea coast comprising 13 resorts with 814 tourist accommodation facilities, along 70 km of coastline between Navodari and Vama Veche resorts.

In the South-East Region, some strategic points can be noted in the promotion and development of tourism related services due to the presence of pan-European transport corridors, high accommodation capacity (about 40% of Romania's summer tourist accommodation capacity) flexible and qualified workforce (high level of training - 9.9% higher education, fourth place). However, the region also faces problems in the development of tourism activities related to the low level of efficiency and safety of traffic on transport networks, a seasonal nature of tourism on the seaside, the absence of coherent development policies and programs and a high level of prices in tourism, as well as a poorly developed or outdated tourism infrastructure creates a large discrepancy between the old and new facilities in regional tourism.

Inside the region there are a number of isolated tourist centers, the most important being Adamclisi with the Monument Tropaeum Traiani (2nd century AD), the funeral altar; Babadag, the tomb of Geamia Ali-Gazi Paşa; the tomb of Baba Sari Saltuk Dede; Panaghia House next to the glacier that shelters the exhibition of oriental art objects; Babadag Forest Nature Reserve; glade with sculptured monuments in limestone; school camp; a tourist center. The natural complex at Cheia, located in the basin of the Casimcea River, 7 km north of Targusor, Cerna, Horia. Other tourist attractions are the towns of N and NW of the region, such as Focsani, Buzău, Tecuci, Galaţi and Măreşeti.

The natural resources heritage of the region is very rich and includes protected areas, the only seaside area in Romania, natural lakes and therapeutic springs, mountain areas and unique natural sites such as mud volcanoes. Moreover, the rich agricultural tradition as well as the pleasant countryside offer a suitable setting for practicing agritourism.

The South-East Region ranks first in Romania in terms of biodiversity conservation: it is the region with the largest area out of the total protected areas in Romania (43,8% of total Romanian protected areas), as well as the region with the largest area occupied by protected natural areas (about 32% of the area). In its territory there are 144 protected natural areas of national interest -

about 680,463 ha - including a biosphere reserve, a national park and 3 natural parks - as well as 108 sites belonging to Natura 2000 Community Network.

The region presents a favorable framework for the development of agritourism, setting up the types of specific reception structures, getting bigger in the Buzau, Tulcea and Vrancea counties.

According to the tourism studies carried out at the level of the South-East Development Region, Tulcea and Constanta counties rank among the preferences of foreign tourists. The main tourist and interest attractions for foreign tourists are the Danube Delta and especially the Crișan commune, the Tulcea town and the seaside resorts of the Black Sea and the city of Constanța.

b. Balneary tourism

The maritime region of balneary resorts is located in the South-East part of Romania, on the Black Sea Coast, being part of Constanța county, about 14 km away from Constanța city, the biggest commercial and touristic maritime harbor in Romania. On the Romanian seaside, a number of resorts have developed over time, some of them internationally renowned: Năvodari, Mamaia, Costinești, Eforie Nord, Eforie Sud, Techirghiol, Olimp, Neptun, Jupiter, Cap Aurora, Venus, Saturn, Mangalia, which offer natural and cultural attractions to Romanian and foreign tourists. Among these, the most representative medical tourism resorts that were taken for analysis are the following: Techirghiol, Eforie Sud, Neptun and Mangalia. Seaside resorts have a dual specialization, namely relaxation and medical care, offering multiple possibilities for cleaning and treatment for a wide range of diseases using salt water, thermal springs and sapropelic sludge.

The touristic potential of the region has led to the development of several tourist activities focused on various types of tourism: health, relaxation and recreation, cultural tourism, business tourism. Therapeutic natural resources are indicated in the treatment of diseases such as inflammatory rheumatism, post-traumatic diseases, central and peripheral muscular system, respiratory, dermatological, endocrine, chronic bronchitis, and metabolic disorders.

In accordance with GD 1072/2013, the localities and the areas for which the status of the balneoclimatic resort is granted are:

1. Municipality of Mangalia, Constanța county and the appropriate area: Saturn, Venus, Cap Aurora, Jupiter, Neptun and Olimp;
2. Eforie city, Constanța county
3. Năvodari city, Constanța county
4. Techirghiol city, Constanța county

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The Romanian seaside is frequented by two main segments of tourists: the first segment, the passive tourists, the „sunlust” type, which prefer the sun and the beach, representing the majority segment, and the second is the one that uses medical services, treatment and therapy. A small percentage is represented by people living in the surrounding areas, such as Tulcea, Brăila, Galați or those coming from Bucharest (highway access) to spend the weekend in these resorts. Accommodation units in seaside resorts are owned and managed by different organizations:

- 161 units (tourist pensions, hotels, villas, camping sites) which offer 17.659 places for accommodation and which are owned by private companies;
- 18 units, providing 919 places for accommodation, which are owned by individuals.

Local authorities pay special attention to the development of tourism in the area and act in the following directions: creating tourist programs for disadvantaged groups, developing general and tourist infrastructure in particular (parks, entertainment parks, tourist ports, landscaping, etc.). The infrastructure projects involve long-term and medium-term planning, being needed significant investment in this area in order to improve medical and recreational services.

Therapeutic lakes and springs are located in the counties of Brăila, Buzău and especially in Constanța county, which concentrates 6 spa resorts equipped with treatment facilities and recreation services. Among the treatment centers for rheumatic diseases, can be mentioned:

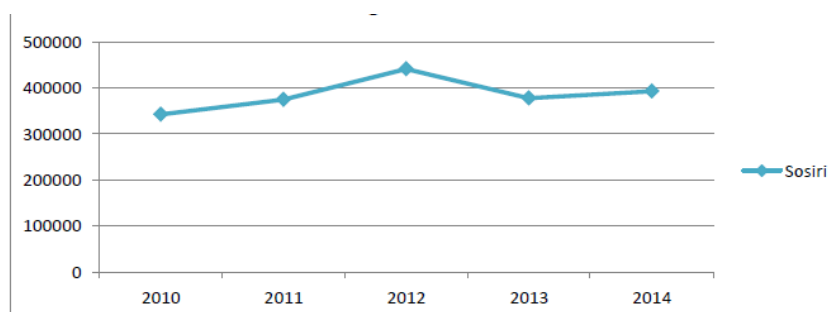
- Eforie Nord (Constanța), located on the seaside and has been functioning since 1894, having at present two treatment bases, based on salt water and therapeutic mud, indicated for rheumatic and gynecological diseases;
- Costinești (Constanța), balneo-climatic summer resort for thalassotherapy and heliotherapy;
- Mangalia (Constanța), the only seaside resort that has mineral springs - sulphurous, mezothermal and radioactive - used in Roman antiquity;
- Neptun-Olimp (Constanța), which has a modern treatment base for electrotherapy, hydrotherapy and mud treatments;
- Techirghiol (Constanța), permanent spa resort on the shore of the lake of the same name. The main natural therapeutic factors are the salt water and sapropelic mud of Techirghiol Lake. The resort has five treatment facilities with many facilities (for hot tubs or pools with concentrated salt water from the lake, for hot mud baths and for mud balloons, aerosols, hydrotherapy);
- Sărata Monteoru (Buzău), a spa resort surrounded by forested hills and terraces on which vineyards are grown, enjoying a moderate climate and features electro and hydrotherapy

facilities, hot mineral water baths and outdoor mineral water pools.

- Balta Albă (Buzău), balneo-climatic resort (30 m altitude) situated on the shores of the Balta Albă lake (1,012 ha), the largest river valley on the lower course of the Buzău River. The natural factors are: mineral water from the lake; sapropelic sludge; steppe bioclimate. From the sludge of the lake is produced the extract called Pelt-Amar, used in cosmetics and medical preparations. The cure in Balta Albă resort is recommended for rheumatic, post-traumatic and peripheral nervous system diseases, professional diseases.
- Lacul Sărat (Brăila), a permanent spa resort operating since the first half of the 19th century. XIX. The bottom of the lake is covered by a highly mineralized mud, considered one of the most valuable sapropelic sludge in Romania. Sărat Lake is equipped with facilities for water and mud treatment, aerosols, electro and hydrotherapy.

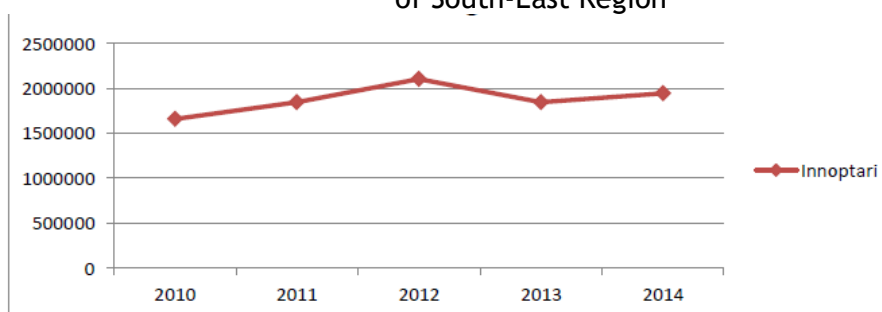
According to the data provided by specialized institutions, starting 2010, spa tourism recorded a favorable evolution in the South-East Region.

Figure no. 162 Arrivals in tourist accommodation structures, in the main balneary resorts of South-East Region



Source: processing data from the National Institute of Statistics 2017

Figure no. 163 Overnight stays in tourist's accommodation structures, in the main balneary resorts of South-East Region



Source: processing data from the National Institute of Statistics 2017

Constanța county is located at the border with Bulgaria. The two countries have a great tourist potential and the openness to the Black Sea has created opportunities for joint projects. The "Cross-border Tourism Development Center Romania - Bulgaria" aims to improve the tourist infrastructure in the border area and regional business in order to increase the accessibility of the information system for the beneficiaries in both countries. The project also aims to improve cooperation between public and private institutions in Constanta County and Dobrich district.

c. Niche tourism

Among the most famous forms of niche tourism we can mention: bird watching, photo safari. In the Danube Delta there are rare species missing from other parts of the continent: 30 types of ecosystems and 5.429 species - out of which 1.839 species of flora and 3.590 fauna species, given that in the Danube Delta there are 331 species of water birds (*Pelecanus oncorhynchus*) and Pelican (*Pelecanus crispus*), 60% of the world population of small cormorants (*Phalacrocorax pygmaeus*) and 50% of the world population of red-necked goose (*Branta ruficollis*) (during the winter).

In case of niche tourism, the only conditions for the entrepreneur to approach this form of tourism are:

- To know the niche very well;
- To see in it an opportunity to do business and to make a plan in this respect;
- Being passionate about that activity (the latter condition is not mandatory);

In Romania, viticulture is present in all areas and, as the agriculture, can become an important source of income not only in the country's economy but also in the South-East Development Region. The largest vineyard is in Dobrogea, Murfatlar with over 3000 hectares around Murfatlar, Trajan's Wave, Alba Gate and Siminoc, which continues with Babadag, in the north of Razelm-Sinoe Lake and the Histria area. If Murfatlar has an estimated production of 25 million liters per year, in 2009, 23% of Romania's annual wine production is the merit of the sunny climate and of the ever-steady hills that favor this and all the wine-growing areas mentioned offer varieties significant productions.

Oenological tourism, as a niche tourism, can become an important source of income for the wine-cellars and vineyards existing in the South-East Region, which means that all cellars whose products - wine, unfermented wine, plum brandy, etc. - must be known and of course sold, must associate promotional activities with the organization of accommodation and catering services for areas where vineyards are located. This brings potential tourists to taste, tasting must be accompanied by some preparations to eliminate the taste of an assortment of wine in anticipation of the next

variety. Accommodation spaces are designed for visitors who drive cars and who can also enjoy the quality of the tasty wines. If the area is close to historic monuments, fortresses, fortified churches, museums or hiking areas, there can be organized visits to these tourist spots or outdoor walks, with harness, snowmobiles during winter or even rides. These activities can be followed by gourmet evenings with preparations specific to the area.

In this way, the attraction of gastronomic and oenological tourism can find potential customers, especially among foreign tourists but also among those who want to know the benefits of Bacchus' drink in Romania.

One of the most famous wine festivals organized in the South-East Region is the "Bachus" International Festival of Wine that is held annually in Focșani. The festival is organized by Vrancea County Council and Focșani City Hall, with an annual budget of over 1 million lei. The festival includes not only wine tastings, organized and realized with the participation of famous sommelier within the Sommelier Organization in Romania, but also many activities, traditional competitions or with the purpose of promoting the history of wine and the culture of the region as a whole. For example, the interpretation of the traditional song "Old Vine Songs" aims to promote folk songs and traditions in Vrancea region. The People's Crafts Fair in the South-East Region is organized within the festival, aiming to promote crafts in the region. Also, the Vineyard Road is organized annually on a bicycle to promote vineyard culture, show tourists what a vineyard actually means, while promoting ecology. The event also includes folk ensembles, cultural organizations from the region, national and international artists, associations of producers from different fields of activity, and attracts about 10,000 visitors a day, of which the number of foreign tourists is estimated to be about 5,000 during the whole festival.

Constanta County Council organizes annually the 10-day Dobrogea Harvest and Wine Festival, during which visitors have theater performances, folk concerts, culinary contests and shows, cooking competitions, wine tasting and dance contests.

Annually, in October, at Ostrov Domains (Constanta County), takes place the "New Wine" Festival, the intention of the organizers being to continue the Dionysian traditions that began since the antiquity. In addition to all kinds of Ostrov wine, participants at the "New Wine" Festival can taste traditional Romanian dishes, such as: lambs on fork, stew, jerky goat, grilled minced meat rolls, which remain in the tradition of Ostrov Domains. In general, over 1000 participants from Romania, but also from Bulgaria (due to the immediate vicinity of the city of Silistra), Italy, France, Turkey, Israel participate in this festival. At the festival are invited Romanian ensembles and folk music

ensembles from Dobrogea, Bulgaria, as well as many personalities. The region also offers a good setting for agritourism, which has grown in Buzau counties (Gura-Teghii, Lopatari, Bisoca, Cătina, Calvini), Tulcea (Danube Delta) and Vrancea (Soveja, Lepşa). Nowadays, however, the development of agrotourism is still limited: only 1,4% of tourist accommodation capacity in operation is in structures classified as rural pensions, which are concentrated in the counties of Buzau, Constanta, Vrancea and Tulcea.

The tourist potential of the region is related to cultural heritage, including historical vestiges, religious and cultural buildings, monuments and museums.

The religious objectives include a significant number of monasteries, located in all counties. Established for the most part in the past centuries, some of the monasteries in the South East region are often very valuable from the historical and / or artistic point of view: an attraction for tourists and pilgrims sometimes provides accommodation facilities. The list of monasteries is presented in the annexed tables.

Other remarkable religious buildings are reminded:

- The Greek Church in Braila (1863 - 1872), with valuable stained glass and frescoes made by Gheorghe Tăttărescu.
- The "Mihail and Gavril" Church in Braila, a former mosque (XVII century), turned into an Orthodox church in 1831
- The large Buzau diocese, built in 1507, during the reign of Radu the Great and rebuilt by Matei Basarab in 1649.
- The Râmnicu Sarat Monastery Church, built during Constantin Brâncoveanu (1691-1697).
- The orthodox Cathedral in Constanta, built between 1883 and 1895 in the old architectural style of Wallachia
- The Greek Metamorphosis Church in Constanta (1865-1867),
- "Precista" Fortress Church from Galati, built in 1647 during the reign of Vasile Lupu, the valuable architectural monument;
- Movromol Church in Galati, built in 1669 by Gheorghe Duca and restored by his son between 1700 and 1703.
- Niculiţel Basilica (15 km from Isaccea, in Tulcea County), the oldest building of its kind known to date in our country. It is an architectonic uniqueness in Europe. The basilica and the crypt were built during Emperor Valens (after AD 370).

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Particularly historical and artistic are the Muslim religious edifices in the counties of Constanta and Tulcea: to remind the Ali Gaza Paşa Mosque in Babadag, Tulcea, the oldest monument of Muslim architecture in Romania (XVII century).

Historical vestiges include the traces of the Getic, Geto-Dacian, Roman, Greek and Byzantine, settlements located in the counties of Constanta and Tulcea. The more valuable remains are:

- the largest Geto-acted necropolis in Dobrogea (IV-III BC) located in Enisala (Tulcea);
- the Histria fortress at Histria (Constanţa) is the oldest Greek settlement on the territory of Romania, founded in 657 BC, by Greek settlers from Asia Minor and now called "Romanian Pompeii".
- the Tomis Fortress in Constanţa (VI century BC), which preserves valuable vestiges from the ancient port city;
- the Roman Edifice with Mosaic in Constanta, III - IV d.

The cultural and architectural heritage of the region is rich, but is very often in degradation: buildings and infrastructure in the historic centers of the region's cities are degraded and require significant renovation.

The Danube Delta Fish Borsch Festival organizes gastronomic competitions based on traditional deltaic recipes by chefs from all over the Delta, who compete in the mastery of cooking in two rounds and the section "Best Borsch Fish "Sections that take place over two days. In addition, during the festival, local folklore is represented by the delta ethnicities and the beauties of the delta biodiversity.

In the spirit of promoting sport and slow tourism based on the principles of sustainable development, is organized the Canoe Competition for Junior of Delta sponsored by Ivan Patzachin.

The Fish and Seafood Festival, organized in the Mamaia resort, is addressed to chefs from the seaside restaurants, the Danube Delta, but also from the rest of the country, and takes the form of a culinary art contest with a fishery specific, the preparations of participants being noted by a commission of jurors and subsequently awarding prizes: the big trophy, medals and diplomas of participation.

The Black Sea Fish Festival, which took place in the resort of Mamaia, is the Euro-Toques Professional Association of Romania and is the most important event dedicated to the consumption of fish from the Black Sea and Culinary Art. The event includes: Culinary Art Exhibition and Competition, Culinary Concert in Boxes, Live Cooking Show by Masters of Flames Culinary Division in

Constanta, a Seminar on "Chefs Code of Honor" written by Master Paul Bocuse in 1986 and published in the Romanian Restaurants Guide.

1.3.3.7. ICT, High Tech, Nanotechnologies and Advanced Materials

The information and communications technology, high-tech, nanotechnologies and advanced materials industry are currently experiencing an unprecedented development. Moreover, Romania is internationally recognized for well-trained workforce in the ITC field and for the dynamics of the Romanian ITC industry.

a. ICT

Information and communication technology (ICT) is the name that provides a set of tools and technological resources used to communicate and create, disseminate, store and manage information for the educational process.

Information and communication technology is the technology needed to process (procuring, processing, storing, converting and transmitting) information, in particular through the use of computers. Information technology finds application across multiple data and information domains, such as processors, computers, hardware and software, programming languages, data structures, and more. There are considered as part of the IT field all elements that process, in one way or another, data, information or knowledge.

The Global Information Technology Report 2016 came with the following clarifications:

- Worldwide, the transition to a digital economy is taking place;
- The digital revolution changes the nature of innovation;
- Organizations will have to innovate continuously through digitization;
- The need for technological innovation in the public and private sector is strongly felt globally.

Information and Communication Technology (ICT) is a field of smart specialization found at the level of the South-East Development Region thanks to the university centers offering ICT specialization, developing research projects in the field of ICT, but also due to the presence of the Software Park in Galati. In fact, information and communication technology is present in almost all economic activities and leads to accelerated development, regardless of the field.

b. High Tech

The term high-tech is an abbreviation of high-technology. This is the technology that corresponds to the current technical level. As the high-tech sector uses the latest technology, it is considered as a particular factor of economic growth. This perception led to large investments in this sector in recent years and a surprising evolution of high-tech products. High tech products are considered to have an innovation content on which approximately 3,5 to 8,5% of their value is based. The presence of Galati Software Park in the South East Development Region creates the premises for the development of high-tech products in the region.

c. Nanotechnologies and advanced materials

Nanotechnology is a collective term for technological developments at nanoscale. In broad terms, nanotechnology is any technology whose finite result is nanometric: fine particles, chemical synthesis, advanced microlithography, and so on. In a narrow sense, nanotechnology is any technology that relies on the ability to build complex structures while respecting atomic specifications using mechanical synthesis. Nanometric structures are not only very small, reaching even to the atomic scale, but they possess some totally unique and unexpected properties, compared to the same substance taken at the macroscopic level. At the level of the South-East Development Region, the Institute for Nanotechnologies and Alternative Energy Sources - INSAE, operates at Ovidius University in Constanta. The Institute has the following laboratories and centers:

- Scientific Research Platform for Hydrogen and Biogas Production - HyRES - realized through the HyRES Project, Contract in the CEEEX Program;
- CAD / CAM / CAE Lab - developed in collaboration with Rand Worldwide and IBM;
- The Advanced Energy and Nanofluid Systems Laboratory - conducted in collaboration with the Research Institute of Karlsruhe and the Chinese Academy of Sciences - Hefei Institute of Solid Physics.
- Combustion Cell Laboratory - realized through METEORA Project, Contract within PNCDI, MENER Program, Subprogram C3 - New Energies and Renewable;
- The Business Managerial Consultancy Center - was established in 1997 with USAID support by Washington State University to help develop SMEs in the region.
- Romanian-Russian Center for Nano and Micro Technologies organized in collaboration with the Federal University for Science and Technology - MISIS, Moscow.

The Institute collaborates with the following laboratories:

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- The Electronic Microscopy Laboratory, equipped with modern electronic microscopy equipment.
- Plasma Physics Laboratory, equipped with plasma production facilities.
- The Galvano-Magneto-Optical Measurement Laboratory, equipped with measuring devices for solid state physics measurements and investigations.

Advanced Materials Engineering is a niche economic area, with a rapid growth in recent years due to the limited resources. The field includes advanced methods of materials investigation, design, modeling and simulation of processes in materials engineering, technologies for obtaining micro and nanostructural materials, science and expertise of advanced materials, etc. In the Southeast Development Region there are both university degree programs dedicated to materials engineering (Material Science and Informatics applied in Materials Engineering - "Dunarea de Jos" University of Galati), as well as companies that are active in the field of advanced materials. For example, Ceprohart SA has experience in research and development services for the pulp and paper industry and other related fields. It manufactures and sells specialty stationery assortments: filter media for food liquids, security paper for value papers, food packaging paper, quality filter paper, electrical insulating paper, special paper and cardboard for copying and printing.

In view of these realities, ICT, High Tech, Nanotechnologies and Advanced Materials have been proposed as field of smart specialization within the South East Development Region because:

- The ICT industry is a benchmark for economic growth in Romania, accounting for 6-7% of GDP;
- The added value of the sector is superior to other economic sectors and with great export potential;
- Romania ranks first in the EU in the use of ultra-fast broadband services;
- Development of Galati Software Park;
- The existence in the region of education and training centers with a tradition in the field of information technology;
- Labor force in the field with a high degree of specialization.

In order to develop ICT, High Tech, Nanotechnologies and Advanced Materials at the regional level, we can have different directions for smart innovation and specialization:

- Development of educational software for different levels of education;

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- Document Intelligence and Document Flows for Smart Cities;
- Interoperability interconnection of databases in institutions;
- Integration and implementation of a telecommunication system in the field of ship transport;
- Programs to continually inform Internet service users about cyber attacks;
- Programs to raise awareness of the benefits of adopting SMART solutions in the community and their added value (SMART city solutions, SMART government);
- Implementation of specialized software in the field of agriculture, food industry, shipbuilding, clothing industry, etc.

1.4 The SWOT analysis

The concept of smart specialization has been implemented by the European Commission in the framework of the Cohesion Policy, which is a major requirement for the allocation of structural funds after 2014. The foundation and use of a smart specialization strategy at a given territory is a key component in identifying and making investments with an efficient and effective impact on research, development and innovation. The main objective of innovation strategies is to improve the economic performance of states by supporting local activities with development potential.

A smart strategy involves knowing the strengths and weaknesses that define a territory, good governance and straightening efforts in a common direction of all the stakeholders. The SWOT analysis is the tool for identifying the weaknesses and weaknesses of a region as well as the opportunities and difficulties it faces. It has the role of creating a clear vision of the elements with potential for capitalization and their arrangement in the form of priorities.

Developing the SWOT analysis is the next essential step in the intelligence specialization strategy, carried out after the analysis of the current context of the target territory, necessary to substantiate a well-established plan of future investments in R & D and innovation.

<u>Strengths:</u> <ul style="list-style-type: none">• The GDP / regional evolution over the analyzed time horizon shows an increase of approximately 24% between 2010 and 2015.• The share of gross investment in services increased in 2010-2015 at the level of the region.• Although the trend is descending both at European and national level, the share of GDP for investment is higher in Romania than the European average.• The increased specialization potential of the South East Region in the Wholesale and Retail Trade; repair of motor vehicles and motorcycles, global utility index calculated for 2011-2015 increasing from 3,54 to 4,17.• Increasing the level of total expenditures from the research and development activity in the counties of	<u>Weaknesses:</u> <ul style="list-style-type: none">• Reduced employment rate of human resources (62,8%) compared to other development regions (sixth out of eight).• Recording of an increased unemployment rate in the South-East Region.• The Southeast Region has a relatively low average monthly nominal earnings compared to other regions in the country (the penultimate national level in 2015 - 1.600 lei).• Growing but low number of innovative businesses.• The share of gross investments in industry has decreased.• Deficit balance of trade balance for almost all counties of the region, except for Constanta, which presented only one year of deficient balance,
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<p>Constanta, Galati and Tulcea in 2015.</p> <ul style="list-style-type: none"> • Increase in the number of researchers between 2010 and 2015 from 1302 researchers to 1364. • Existence of 3 national research and development institutes with an activity related to marine ecosystem research, ecology, resource management, marine geophysics and geoecology. • The presence of 7 higher education institutions in the region. • The operation of a significant number of research and development centers in agriculture and fish farming. • Research and development activities carried out by private capital companies. • The existence of a technology information center in Tulcea county, in the field of environment, tourism and sustainable development. • The existence and functioning of 12 clusters in the South-East Region. • Increasing number of patent applications filed by Romanian applicants in Buzau County in 2015 at the State Office for Inventions and Trademarks in Romania. • Increasing the volume of exports in the counties of Tulcea and Vrancea between 2011 and 2015 • Buzău has an excendent trade balance for all the analyzed years (2011-2015). • RXA indicator > 1 for product categories: 01. Live animals; 14. Weaving materials; 15. Animal or vegetable fats and oils; 23. Residues of the food industry; 55. Discontinuous synthetic or artificial fibers; 27. Fuel and mineral oils; bituminous materials; 89. Floating ships, ships and structures; 37. Photographic or cinematographic goods; 72. Cast iron, 	<p>and Buzau.</p> <ul style="list-style-type: none"> • Only two counties in the South-East Region - Constanta and Galati - exceed the national average in terms of value for the competitive potential index, having as main branches shipbuilding and ironmongery. • Low specialization potential of the South- East Region in the field of Performing, Cultural and Recreational Activities, Real Estate Transactions, Financial Intermediation and Insurance; • The South-East Region has the lowest percentage of R & D expenditures in the country as a percentage of GDP, with only 0,06% in 2014; • Reducing the number of R & D personnel from 996 persons in 2010 to 797 persons in 2014; • Local units carrying out R & D and innovation activities in 2014 in the South-East Region represented only 3,27%, the lowest percentage at national level. • The Southeast Region is in the category of low-level innovative regions • Declining the number of innovative businesses from 1108 in 2012 to just 560 in 2014. • The small number of patent applications registered annually at the European Patent Office. • Braila County has a poor trade balance for all analyzed years (2011-2015). • Romania is placed on the last place in the ranking of the EU member countries, depending on the quality of the regional governance. • The low quality of the existing governance at the level of the South-
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<p>iron and steel.</p> <ul style="list-style-type: none"> • The increasing potential of social innovation in the South-East Region. • Diversified industry at regional level. • High development potential of the South-East region. • Implementation of regional development projects such as ARISE, ERIK ACTION; BORDWIIS +, IN-EUR. • Transnational partnerships developed within projects with European funding. • The South- East Region has the largest number of employees in the industry, "water distribution, sanitation, waste management, decontamination activities". 	<p>East Region, according to the ranking of the regions of the European Union's countries.</p> <ul style="list-style-type: none"> • The low degree of absorption of European funds in Romania and the South-East Region. • Low number of sources of information on the quality of regional governance in Romania.
<p><u>Opportunities:</u></p> <ul style="list-style-type: none"> • Implementation of the National Strategy for Research, Development and Innovation 2014-2020. • Existence of non-reimbursable funds through ROP 2014-2020, to increase the competitiveness of SMEs and through NRDP, to increase the competitiveness of the agricultural sector. • Existing funding opportunities to improve technological transfer through the 2014-2020 Regional Operational Programme, Priority Axis no. 1. • Existence of grants through the Operational Programme Competitiveness 2014-2020 - Priority Axis 1. Research, Technological Development and Innovation (RDI) in Support of Economic Competitiveness and Business Development. • At county level, the highest number of graduates at pre-university level is recorded in Constanța, followed by Galați, the last being Tulcea. • The existence of Constanța and Galați 	<p><u>Threats:</u></p> <ul style="list-style-type: none"> • Increased degree of specialization in other regions (Center, Bucharest - Ilfov, North - West) in competitive areas at national and international level. • Emigration of a large number of researchers at national level; • Increasing economic and social problems related to poverty in the less developed areas of the South-East Region. • The existence of a small number of funding sources supporting the smart specialization and implicitly the innovative activities in the region's economy. • The reluctance of the private environment to invest in R & D and innovation. • Bureaucracy in the local public administration. • Legislation unfavorable to the development of some R & D and innovation activities.

<p>universities in the region.</p> <ul style="list-style-type: none">• The presence of industrial clusters, especially for the traditional industries of the region.• Existence of national programmes for financing research and development activities that will be launched in the period 2017 - 2020.• Sources of external financing of R & D and innovation activities.• Governance through greater involvement of SMEs and the educational environment in the regional development process of the South-East Region in the context of the smart specialization strategy.• The high potential for regional development through innovation in the South-East Region.• Existence of cross-border development opportunities.	<ul style="list-style-type: none">• The existence of informal networks.
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1.5. Conclusions of the analysis

The qualitatively and quantitatively detailed analysis of the South-East Development Region reveals a predominantly positive development, which is below the national average. Thus, the analysis of some indicators shows that the region has the potential for economic and social development in the coming years, but all actors involved have to make consistent efforts.

The Gross Domestic Product (GDP) of the South-East Development Region, expressed in millions of lei, was 75.239,3 million in 2014, which represents only 11,26% of Romania's GDP and about 0,12% of EU 28's GDP. Although on an upward trend, the region's GDP is still very small and far below other national regions. In terms of GDP per capita, its value for the South-East Region represents 88,8% out of the national average GDP per capita. Throughout the analyzed time horizon, the share of regional VAB in national VAB has remained relatively constant, around 11%, although the trend of the indicator is rising.

The employment rate at the level of the counties in the South-East Development Region has kept the same upward trend during 2010-2015. The county with the highest occupancy rate recorded in the year 2015 is Vrancea (68,1%), and the lowest occupancy rate in the region is recorded in Galati (54,7%). It is also worth noting the considerable increase of this indicator in the counties of Tulcea, Vrancea and Braila. At the level of the South-East Region, Constanta County recorded the lowest unemployment rate in 2015 compared to the other counties of the region of only 3,6%, thus being below the national average. At the opposite pole, the counties with the highest unemployment rate in the region are Buzau (10%) and Galati (9%).

The South-East Region occupies the seventh position in the national ranking of the civilian active population, with a value of 1.037,9 thousand persons in 2015, being superior to the South-West Oltenia Region, which registered the value of 858 thousand people.

Regarding the number of active local units, the South-East Region ranks fourth among the regions, with a total of 59.845 active local units. In 2015, the local units active in the South-East Region reach the highest value in the county of Constanta (21.311), followed by Galați county, with 11.834 active local units. The analysis shows that the areas of activity in which most of the local units active in 2015 in the South-Eastern Region are: wholesale and retail; repair of motor vehicles and motorcycles (22.529), manufacturing (5.509) and transport and storage (5.405).

Analyzing the situation of the average number of employees by development region, at the level of the South-East Region it can be noticed an improvement of the average number of employees

starting with 2013, after having experienced a fluctuation period between 2010 and 2012. In 2015 the average number of employees at the level of the South-East Development Region was 509.582, which occupies the sixth position at the national level and represents 11,05% of the total average number of employees in Romania.

In 2015, the average net monthly salary of the South East Region is 86% of the national average net monthly salary for 2015, which classifies the South East Region below the national average. The Southeast Region had a net average salary of just 1600 lei in 2015.

Direct foreign investments are an extremely important indicator in a region. As for the South East Region, the share of DFI has decreased over the period under review, from 6,26% in 2010 to 5,89% in 2015. Among the reasons most frequently expressed reasons are the lack of transport infrastructure, lack of relevant tax incentives and bureaucracy.

Regarding the balance of trade balance in the South-East Development Region, the data analysis shows that Braila has a poor trade balance for all the analyzed years, Buzău is in a diametrically opposed situation, its trade balance being excedentary, Constanța County records only in 2012 a bad trade balance, Galați and Tulcea have an excedentary trade balance only in 2013, Vrancea records in only one year an excedentary balance, namely in 2013.

In 2016, the South East Region records comparative advantages over the following product groups under the Combined Nomenclature (CN): 01. Live animals; 02. Meat and edible offal; 03. Fish and crustaceans; 08. Edible fruit; 10. Cereals; 11. Products of the milling industry; 12. Seeds and oleaginous fruits; industrial or medicinal plants; 14. Weaving materials; 15. Animal or vegetable fats and oils; 18. Cocoa and cocoa preparations; 23. Residues of the food industry; 25. Salt; sulfur, stones; plaster, lime and cement; 27. Fuel and mineral oils; bituminous materials; 28. Inorganic chemicals; 37. Photographic or cinematographic goods; 39. Plastics and articles of plastics; 43. Fur and articles of fur; 51. Wool; 55. Discontinuous synthetic or artificial fibers; 62. Articles of apparel and clothing accessories, other than knitted or crocheted; 70. Glass and glassware; 72. Cast iron, iron and steel; 79. Zinc and articles thereof; 83. Miscellaneous articles of base metal; 89. Ships, ships and floating structures.

At the level of the South East Development Region, the research and development potential based on research and development activity has been identified by analyzing the size and dynamics of research and development spending, as well as the enterprises that activate in the R&D field and of the personnel involved in.

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The South-East Region has the lowest percentage of research and development spending in Romania in 2014, with only 0,06%, and at the European level, only the Ciudad Autónoma de Ceuta region (ES) (0,06%) declaring an equally small percentage. From the analysis of the total expenditures in the research and development activity, on the counties of the South-East Region, it can be noticed that the counties with a larger volume of RD expenses are Constanța, Galați and Tulcea. Vrancea is the county with the lowest spending on research and development. In Galați county, compared to 2010, expenditures on RD activity decreased dramatically, from 38.196 thousand lei in 2010 to 8.443 thousand lei in 2015. In the South-East Region, the number of RD personnel decreased from 996 in 2010 to 797 in 2014.

Analyzing the situation in the counties of the South-East Region, it is noticed that the largest number of researchers in 2015 was registered in Constanța County (815 persons), followed by Galați county (413 persons) and Tulcea (74 persons). In the counties of Brăila, Buzău and Vrancea, the number of researchers is significantly lower and there are no university centers.

At the level of the South-East Region in 2014, 26 local units carried out R & D activities, representing only 3,27% of the national total. The South-East Region is thus the last region at national level as a number of RDI units.

According to the European Commission's 2016 Regional Innovation Scoreboard, all the development regions in Romania are in the category of low-level innovation regions, due to a low number of research, development and innovation units, to the very limited financial resources dedicated to innovation, inconsistent innovation policies and a small number of staff involved in RD and innovation.

The South-East Region is a region with a low degree of innovation. According to the Regional Innovation Scoreboard 2016, innovation performance in the region decreased by 9% compared to 2014. In the South-East Region, the number of innovative enterprises decreased from 1108 in 2012 to just 560 in 2014. The decline in the number of innovative enterprises in the period under review can be determined by the lack of funding opportunities after 2013, but also by the unstable economic environment that does not encourage sustainable innovation activities.

In the South-East Region, there are two technology information centers, one in Constanta county, in the field of agri-food and renewable energies and the second one in Tulcea County, in the field of

environment, tourism and sustainable development. There are also 12 clusters, 2 industrial parks and one software park.

In the South-East Region, 0,855 applications for patents were filed with the European Patent Office per million inhabitants. As regards the number of patent applications filed by Romanian applicants at the State Office for Inventions and Trademarks in Romania, a total of 980 applications were filed in 2015. Out of these, only 15,6% were registered in the South-East Region, most of them in Buzău County.

The processing of available data on the activities of the national economy for the period 2011-2015 in the South-East Region reveals a number of trends in the region's specialization potential. At regional level, over the five years under review, there are some economic activities that dominate the activity of the active units in the region, such as: manufacturing, wholesale and retail; repair of motor vehicles and motorcycles, agriculture, forestry and fishing, transport and storage, constructions, water distribution; sanitation, waste management, decontamination activities.

The benchmarking exercise conducted at the level of the study provides a number of relevant findings in relation to R & D and innovation activities in the South East Region:

- The South-East Region performs better than the regions included in the analysis (except Wales) in relation to non-RDI spending and domestic innovation among SMEs.
- Performances similar to those of the regions included in the analysis are those related to cooperation between innovative SMEs and access to Horizon 2020 funds.
- Lower performances of the South-East Region compared with the analyzed regions are recorded relative to the funds dedicated to RDI activities (public and, in particular, private) and the allocation of FDI funds for RDI, this latter finding being valid for the other regions of Romania included in the benchmarking analysis.

It is relevant to emphasize that, from the analysis of a significant number of economic and social indicators, Constanța County is highlighted by a higher development than other counties in the region. This fact is directly correlated with the much more developed transport infrastructure in this county, but also with the fact that Constanta is an important economic and tourist center of Romania and has benefited from consistent investments in recent years. Moreover, Constanta port is the largest port in Romania, and the city is also an important university center.

The analysis of the economic and social indicators brings to our attention a series of areas with smart specialization potential in the South-East Development Region. These areas were discussed

and analyzed during the focus groups conducted at the region level with relevant actors belonging to the quadruple helix: the public sector, the private sector, NGOs and universities. The areas of smart specialization proposed are:

- **Engineering and shipping:**
 - o Construction and repair of ships;
 - o Shipping transport;
- **Clothing industry;**
- **Agri-food and fisheries:**
- **Biotechnology:**
 - o Agri-food biotechnologies;
 - o Environmental Biotechnologies;
- **Eco-technologies:**
 - o Ecological technologies and energy efficient;
 - o Equipment for the production of bioresources;
- **Tourism:**
 - d. Traditional tourism (maritime tourism, Danube tourism, mountain tourism, etc);
 - e. Balneary tourism;
 - f. Niche tourism.
- **TIC, High Tech, Nanotechnologies and Advanced materials.**

These fields have potential for smart specialization at the level of the South-East Development Region and can become industries in which the region can establish long-term partnerships both at national and international level and can have a say in research- development and innovation.

Chapter II. Regional governance: ensuring participation and ownership

2.1. Particularities of the development and regional governance process in Romania

2.1.1. National Strategy for Regional Development in Romania

The National Regional Development Strategy (NRDS) represents the Romanian Government's vision on regional development, which establishes the development priorities of the regions as well as the institutional relations that facilitate the correlation with the sectoral strategies.

The regional policy in Romania is implemented by development regions, formed by groupings of counties, constituted by their voluntary association on the basis of a convention signed by the representatives of the County Councils and by the General Council of the Municipality of Bucharest. The eight development regions, created according to the Regional Development Law no. 151/1998 (as amended by Law 315/2004), are presented in the following table.

Table no. 24 Development regions in Romania

RO11	North-West	Bihor, Bistrița-Năsăud, Cluj, Maramureș, Sălaj, Satu-Mare
RO12	Center	Alba, Sibiu, Brașov, Covasna, Harghita, Mureș
RO21	North-East	Bacău, Botoșani, Iași, Neamț, Suceava, Vaslui
RO22	South-East	Brăila, Buzău, Constanța, Galați, Tulcea, Vrancea
RO31	South Muntenia	Argeș, Călărași, Dâmbovița, Giurgiu, Ialomița, Prahova, Teleorman
RO32	Bucharest-Ilfov	Municipiul București, județul Ilfov
RO41	South-West Oltenia	Dolj, Gorj, Mehedinți, Olt, Vâlcea
RO42	West	Arad, Caraș-Severin, Hunedoara, Timiș

According to the National Regional Development Strategy, the overall objective is to continuously improve the quality of life by ensuring well-being, environmental protection and economic and social cohesion for sustainable communities capable of managing resources effectively and harnessing the potential for innovation and balanced economic and social development of the regions.

For the period 2014-2020, the National Strategy for Regional Development aims at harmonizing the

existing policies and strategies in the different areas at the regional level.

Another important component of the quality of life and also of the regional development strategy, is the measures to improve education, health and social care infrastructure, which complement the measures and investments in human resources. The regional dimension of these measures will allow for the special needs of certain areas to be taken into account and for the investment in the three types of infrastructure to be kept to a reasonable and balanced level throughout the country so as to reduce the differences between regions in this regard or in order to be able to keep the current relatively close levels of qualification of the population and of the overall training of human capital in the regions.

The National Regional Development Strategy has as a priority the general improvement of the business environment, by encouraging innovation and competitiveness measures. Investments need to be concentrated in the areas where they are genuinely necessary and can help to mitigate market failures.

The development of innovation-specific infrastructure and the stimulation of SMEs' competitiveness are essential regional measures as these economic entities act as real drivers of regional and local economic growth.

2.1.2. Regional Operational Program - the main instrument for implementing regional policy

In Romania, regional policy is an effect of the integration process in the European Union, its specific instruments (legislative, institutional, financial, etc.) being still in a process of adaptation / modification. The only constant of this process is, in fact, the eight development regions created in 1998 (Law No 158/1998, modified by Law 315/2004), which do not have an administrative status, but rather a planning and statistical one, focusing on the identification of territorial problems, certain categories of problems and actions (differentiated on the basis of certain indicators).

The strategic objective of the current regional policy is to reduce the level of regional disparities, which involves multiple (sectoral) and target areas (priority areas, industrial restructuring areas with growth potential, growth poles, development poles, urban centers etc.), each of the eight development regions (except Bucharest-Ilfov) comprising such areas.

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The main instrument through which the regional development policy is implemented in Romania is the Regional Operational Program. The 2014-2020 Regional Operational Program (ROP) is the successor of the 2007-2013 Regional Operational Program and one of the programs through which Romania will be able to access European Structural and Investment Funds from the European Regional Development Fund (ERDF) in 2014-2020. The Regional Operational Program (ROP) 2014-2020, managed by the Ministry of Regional Development, Public Administration and European Funds as Managing Authority, was adopted by the European Commission (EC) on 23 June 2015.

The strategic vision on the development needs to be met by the ROP 2014-2020 is based on the analysis of the economic and social situation of the regions of Romania (in the National Strategy for Regional Development 2014-2020), which led to the identification of the following main issues:

- Development and innovation: limited transfer of research results to the market and low level of assimilation of innovation in firms,
- SMEs: an insufficiently developed SME sector, with a negative impact on the competitiveness of regional economies. The main weaknesses of the SME sector in the national strategic programming documents are:
 - a low degree of entrepreneurial culture - reflected by the relatively low business density in all regions,
 - a low resilience of new businesses - 2/3 of new businesses disappear from the market in their first year of life.
- Energy efficiency: unsustainable energy consumption and high saving potential in public infrastructures, including public buildings and residential buildings.
- Environment: high pollution level in urban areas.
- Urban development: urban areas degraded, vacant or unused in cities in Romania.
- Heritage resources: valuable resources of cultural heritage poorly capitalized.
- Tourism: valuable, balanced, territorially distributed tourism potential - an alternative for revitalizing less developed / isolated areas.
- Road infrastructure: the low accessibility of certain areas of the country, resulting in low attractiveness and extremely low investment.
- Social infrastructure and education: under-dimensioned educational, health and social services infrastructure impedes social inclusion and human capital development.
- Cadastre: low level of cadastral records, affecting the implementation of policies regarding the socio-economic development of local communities.

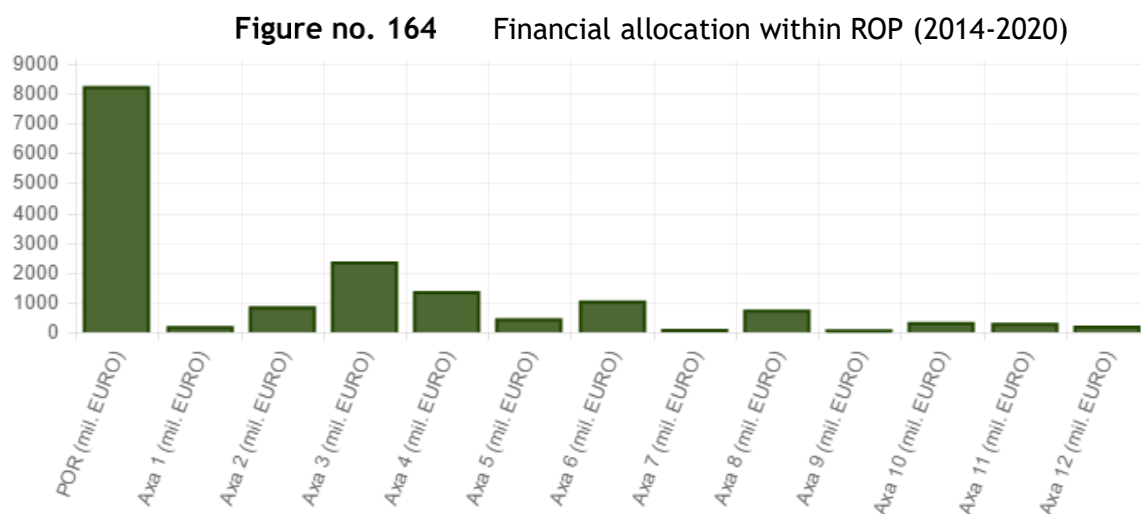
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- Administrative capacity: the need to strengthen the administrative capacity of the ROP Managing Authority, ROP Implementing Bodies and Beneficiaries, to ensure a proper implementation of the ROP.

These lines of action were correlated with the strategic directions of the European Commission as regards the financing from the European Structural and Investment Funds through the European Regional Development Fund for the period 2014-2020:

- Innovation and research;
- Digital Agenda;
- Support for small and medium-sized enterprises (SMEs);
- Low-carbon economy.

ROP 2014-2020 aims to increase the overall economic competitiveness and improve the living conditions of local and regional communities by supporting the development of the business environment, infrastructure and services for the sustainable development of the regions so that they can effectively manage resources and capitalize on their potential for innovation and assimilation of technological progress.



Sursa: Ministry of European Funds, 2017

These objectives are translated into 11 priority axes (plus a technical assistance axis), with an estimated total allocation of € 8.25 billion, of which € 6.7 billion represents EU support through the European Regional Development Fund ERDF), and € 1.5 billion - national contribution:

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- Priority Axis 1: Promoting technology transfer - € 206.51 million;
- Priority axis 2: Improving the competitiveness of small and medium-sized enterprises - € 877.11 million;
- Priority Axis 3: Supporting the transition to a low-carbon economy - € 2374.57 million;
- Priority Axis 4: Supporting sustainable urban development € 1386.86 million;
- Priority axis 5: Improvement of the urban environment and preservation, protection and sustainable valorisation of cultural heritage - € 466.5 million;
- Priority Axis 6: Improvement of the transport infrastructure of regional importance - € 1068.37 million;
- Priority Axis 7: Diversification of local economies through the sustainable development of tourism - € 118.9 million;
- Priority axis 8: Development of health and social infrastructure - € 764.45 million;
- Priority axis 9: Supporting the economic and social regeneration of disadvantaged communities in urban areas - € 101.41 million;
- Priority Axis 10: Improving educational infrastructure - € 352.19 million;
- Priority Axis 11: Geographical expansion of the property registration system in the cadastre and land book - € 312.89 million;
- Priority Axis 12: Technical Assistance - € 221.28 million.

2.1.3. Institutional partners involved in the regional governance process

At national level, the main institutional partners, acting as decision-making and administrative structures and having direct responsibilities in the regional development process, are the Ministry of Regional Development, Public Administration and European Funds and the National Council for Regional Development.

The role of the **Ministry of Regional Development, Public Administration and European Funds** in the country's regional development process can be synthesized as follows:

- elaborates the draft of the National Development Plan, which is submitted for approval to the Government;
- ensures the coordination of the implementation of the national development policy for the country as a whole, by region and by zone;
- aims at achieving the objectives of economic and social cohesion, in order to diminish the gaps

in the development of regions and areas of the country, to strengthen the competitive capacity of each region;

- cooperates with the Ministry of Foreign Affairs in achieving the external cooperation objectives of the cross-border, interregional or euroregional development regions;
- analyzes and proposes to the National Council for Regional Development the establishment of regional development programs and projects; develops support programs for the regions in order to acquire the necessary means to restructure the regional economies;
- develops the criteria, priorities and procedures needed to fund regional development programs and projects; develops support programs for the regions in order to acquire the necessary means to restructure the regional economies;
- elaborates the criteria, priorities and procedures necessary for the financing of programs and projects in its field of activity - programs for economic areas with special status - deprived areas, industrial parks, etc. are submitted for approval to the Government;

Among the main responsibilities and attributions of the **National Council for Regional Development** can be mentioned:

- endorses national policies and the strategy for regional development as well as the National Development Plan, which contains the priorities and multi-annual measures for financing the national objectives of economic and social cohesion;
- approves the criteria and priorities regarding the use of the National Fund for Regional Development;
- Submits to the Government, for approval, the priority programs financed from the National Fund for Regional Development;
- analyzes the use of funds allocated to Regional Development Agencies from the National Fund for Regional Development, on the basis of the monitoring reports elaborated and submitted by the Regional Development Councils;
- proposes how to use the pre-accession funds for the regional development allocated to Romania by the European Union during the pre-accession period;
- aims at achieving the regional development objectives, also within the external cross-border, interregional, euroregional cooperation activities of the development regions;
- approves the projects proposed by the Regional Development Agencies and approved by the Regional Development Council for their funding from the regional development programs in the case of regional project calls;
- approves the projects proposed by the Regional Development Agencies and approved by the

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Regional Development Council for their funding from the regional development programs in the case of national project calls;

At regional level, regional development policy is implemented through the eight Councils for Regional Development and the eight Regional Development Agencies.

Regional Development Councils are deliberative structures comprising:

- the presidents of county councils in the region;
- a representative of local municipal councils in each county of the region;
- a representative of city councils in each county of the region;
- a representative of local communal councils in each county of the region.

According to the law, the most important tasks of the Regional Development Councils are the following:

- coordinates the activity of the Regional Development Agency, observes the achievement of the objectives of the regional development policy and ensures equal and fair treatment of all the counties within the region;
- analyzes and approves the regional development strategy;
- analyzes and approves the criteria and priorities for the selection of regional development projects as well as the allocation and destination of resources from the Regional Development Fund;
- analyzes and approves the regional development projects proposed by the Regional Development Agency;
- approves the documentation prepared to obtain the status of "less favored area";
- analyzes and approves the proposals of the Regional Development Agency for the establishment of the Regional Development Fund.

From an organizational point of view, the Regional Development Council is managed by a president and a vice-president, rotative functions for a one-year mandate occupied by the representatives of the counties, as appointed by them. The president and vice-president must represent different counties.

The Council for Regional Development Secretariat is provided by the Regional Development Agency.

Regional Development Agencies are a non-governmental, non-profit, public utility entity with legal personality that acts on the subject of regional development. Agencies are organized and operate under the terms of the Regional Development Law (151/1998) and the statute of organization and

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functioning, approved by the Regional Development Council. The main tasks of the agencies are:

- develops and submits to the Regional Development Council, for approval, the regional development strategy, the regional development programs and the funds management plans;
- implements the regional development programs and fund management plans in accordance with the decisions adopted by the Regional Development Council, in compliance with the legislation in force, and are responsible for their realization;
- identifies deprived areas within the development region together with local or county councils, as appropriate, and submits the necessary documentation, approved in advance by the Regional Development Council, to the Ministry of Regional Development, Public Administration and European Funds and to the National Development Council regional;
- provides specialized technical assistance, together with the local or county councils, as the case may be, to natural or legal persons, with state or private capital, investing in disadvantaged areas;
- submits to the Ministry of Regional Development, Public Administration and European Funds proposals for financing, from the National Fund for Regional Development, for the approved development projects;
- acts to attract financial resources to the Regional Development Fund;
- manages the Regional Development Fund in order to achieve the objectives set out in the regional development programs;
- is accountable to the Regional Development Council and to the bodies empowered by law for the proper management of the allocated funds.

The level of economic and social development of a region is conditioned by the developments of the business environment, respectively by the economic and financial power, by the size and scope of activity of the companies in the region, and by the structure of the activities carried out at regional level. One of the most effective ways to streamline activities, with a major impact on regional development, is clusters.

Clusters are one of the most popular local and regional development concepts being defined as geographic agglomerations of interconnected companies, specialized service providers, or institutions associated with a domain, present in a particular country or region. The main reason for the emergence of clusters is the need to increase the productivity that underpins the competitiveness of companies. Their development is a new priority and direction in economic

policy, focusing on past efforts in terms of macroeconomic stabilization, privatization, opening up the market and reducing the costs of a business.

In the literature, an opinion exists according to which clusters can affect competition in three ways: first, by increasing the productivity of companies based in the same area; second, by increasing the degree of innovation of companies; third, by stimulating the formation of new enterprises within the cluster.

Geographic, cultural and institutional proximity offers companies the opportunity to develop partnerships, provides them with access to better information, strong incentives, and other benefits that are more difficult to achieve if they are at a significant distance.

Clusters are also called "competitiveness poles" and express the concentration of public or private enterprises, research centers and educational institutions in geographical terms. They are associated in the form of a partnership and are subject to a common development strategy. The cluster is also regulated by Romanian legislation: a group of producers, users and beneficiaries which implements good practices in the European Union in order to increase the competitiveness of economic operators.

Among the benefits of the clusters are the following:

- Increased level of competitiveness in order to meet the new economic challenges.
- Increased productivity and employment rate in the region by interconnecting people, skills, skills and knowledge.
- Increased economic efficiency (it's easy to work with a network with customers and suppliers).
- Innovation is stimulated: interaction with customers creates new ideas and great pressure on innovation).
- There is a constraint on SMEs from large companies.
- Ensuring the ability to influence educational profiles to meet the needs of qualified human resources companies.

In the global market competition, the chances of a country or region's economic success rely on the specialization of supply and the focus of development efforts on key areas where competitive advantages, resources and skills are held. In this situation, "innovative clusters" are the basis for success, as they are a combination of entrepreneurial dynamism, close links between the main actors of innovation - institutions and companies with top-level knowledge.

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For the local economy clusters can increase not only competitiveness but also income, can provide quality jobs, develop investment in research and innovation and promote potential winners. And the state can use funding projects more efficiently by supporting start-ups, innovative companies, implementing effective public policies (for health, education, infrastructure, etc.).

The Romanian funding programs include the National Strategic Reference Framework, the National Strategy for Research and Development 2007-2013, the National Strategy for Sustainable Development of Romania, strategies for regional development.

UNIVERSITIES can become actors with a very important role in the regional development process of the region where they are located, not only because of the educational processes involving different socio-professional categories, but also because of the research potential they have. The eligibility conditions, the know-how available to them and the opportunities for accessing research funding, through funding programs that other types of organizations / institutions can not access, provide universities with a major competitive edge in the regional development process.

The location of universities in a certain spatial context allows them to test certain development and planning theories, to participate in the intra-community dialogue as a partner to be listened to through the solutions proposed, both for solving crises and for achieving certain targets planned by the cities or regions where they operate.

According to the report presenting the results of the implementation of the project *Research on the involvement of Romanian universities in urban restructuring and regional development (2007 - 2010)*, no. 91-028 / 2007, financed under the *4 Partnerships Program in the priority areas 2007-2013*, obviously a relatively important space is given to the way universities are involved in the field of urban restructuring.

Regional development is based on a well-defined policy, on an institutional framework and on operational instruments, which makes a good part of European funds directed to this objective.

Structuring the Romanian higher education on three main cycles is based on the reorganization of the content of the study programs, by identifying and defining the general knowledge, respectively the competencies, such as the specific vocational schools, in order to meet the labor market requirements. Specialized studies highlight a first factor of distortion: the concentration of university infrastructure in nine university centers, which hold more than $\frac{3}{4}$ of the total number of students and teachers. Bucharest has three times as many students as its share, given that it holds

less than 10% of the country's total population. However, it should be noted that there is a very high training potential in Bucharest and that, as a rule, capital cities have representation functions, even in the field of research or university, which go beyond national boundaries, which is why we can say that this share does not seem overly exaggerated. However, the trend of the last 15 years shows a drop in the share, from about 38% to about 32%.

Increasing the degree of involvement of universities in regional development processes can be achieved through the implementation of measures such as:

- Support research-development-innovation universities and their involvement in the creation and development of regional, national and transnational clusters;
- Active participation of universities in substantiating, evaluating and implementing regional strategies for sustainable development and innovation;
- Helping universities to increase their social responsibility at regional and local level.

The main advantages of involving universities in the regional development process can be synthesized as follows:

- Creating appropriate conditions for the practical use of the results of scientific research obtained in universities;
- Making better use of human potential;
- Increasing the visibility of universities in research activity;
- Supporting the regions in the development of indigenous technologies and in their superior valorisation;
- Developing new opportunities for the business environment;
- Increasing the involvement of local stakeholders in technology transfer of research results;
- Improving both fundamental and applied research;
- Contributing to improving teachers' performance and the quality of information they provide to students;
- Increasing the competitiveness of the Romanian higher education internationally;
- Providing better correlation of the theoretical and practical aspects in the university curricula;
- The growing role of universities in the development of regional / local communities is visible;
- Ensuring a better interaction with the economic environment;
- Contributing substantially to improving and diversifying student practice programs;

- Favoring collaboration with the private environment to stimulate technology transfer;
- Providing the necessary framework for university-level research oriented;
- Developing centers of excellence in research.

2.1.4. Regional governance in the context of smart specialization

In November 2009, the European Commission published the "Knowledge for Growth" report by an EU Advisory Group of Experts who sought to find an alternative to public policies aimed at spreading public investment in knowledge and innovation - research, education, public support for business research and development, etc. - quite low in the fields of technological research, such as biotechnology, ICT and nanotechnology. The report also mentions that national governments, and in particular regional governments, should encourage investment in areas that would "complement other productive assets of the country to create future internal capacities and comparative inter-regional advantage." This strategic proposal has been devised as "smart specialization" and has spread rapidly, being adopted in the framework of the EU 2020 Agenda, with its objectives of smart, sustainable and inclusive growth. Indeed, research and innovation strategies for smart specialization (RIS3) are proposed as an ex-ante conditionality for future EU Structural Fund programs to pool resources on research and innovation in order to maximize the impact of structural funds. However, the issues raised by smart specialization far outweigh the discussion in the EU context. A number of countries, within the OECD or not, are now interested in Smart Specialization as a way to manage their economies beyond the crisis by mobilizing regional dynamism in innovative and knowledge-based economic development.

Although initially relatively simple as a concept - focusing public resources on knowledge-based investments on specific activities to enhance comparative advantage in existing or new areas - the conceptual and strategic implications of smart specialization are more complex and cover three distinct areas:

- the fundamental role of scientific, technological and economic specialization in the development of comparative advantage and, in general, in stimulating economic growth;
- policy information to identify areas of comparative present and future advantage;
- governance arrangements that play an essential role for regions, private sector stakeholders and entrepreneurs in translating strategies for specializing in economic and social outcomes.

In this respect, smart specialization is a regional policy framework for innovation-based growth. Having said that, many of the cornerstones of the smart specialization approach are not new and

have been part of a wider discussion on innovation, industrial policies and regional economic development for a long time.

What distinguishes smart specialization from traditional industrial and innovation policies is mainly the process defined as "entrepreneurial discovery" - an interactive process in which market forces and the private sector discover and produce information about new activities, and the government evaluates results and designates institutions to implement action plans and strategies. Smart specialization strategies are therefore go far beyond traditional industrial policies. In addition, emphasis is placed on "knowledge-based activities", both public (for example, education, public research) and private, and not on certain industries. This broader approach offers more scope for the market to determine and lead to downstream elections. However, the operationalization of entrepreneurial innovation processes from a political perspective is a major challenge and requires the collection and analysis of various information that is often held by entrepreneurs or incorporated in public companies and institutions. Incentives and tools for disclosing - whether passively or actively - this information (eg through stakeholder consultations, public-private partnerships, IPRs) will be essential.

Like traditional industrial policy, smart specialization strategies aim to address market / system and coordination failures. But traditional industrial policies required significant levels of information to justify support for subsidies, and there is a tendency to implemente these tools in vertically integrated sectors with stable technological paradigms. Instead, smart specialization recognizes the lack of perfect information, the level of advancement of a given activity, and the relative risks to politics. It therefore focuses on supporting entrepreneurs by identifying regional knowledge-based strengths and using a more exploratory approach where public policy makers listen to market signals using a range of evaluation tools (eg SWOT analysis, surveys) and mechanisms, such as public-private partnerships.

While the central principle of the concept of smart specialization has been rapidly accepted by the EU's political community, particularly with a view to increasing synergies and avoiding double funding at national and Community level in the field of research and innovation, the implicit idea of smart specialization has amplified the concerns of specialists. These include:

- **Government / State Funds Beneficiaries:** In this case, the extent to which smart specialization determines governments to favor certain R & D / technology and innovation activities at the expense of a market-based resource allocation needs to be analyzed. Indeed, the experience with industrial policy in the OECD countries has shown that any

policy involving "winner choice", such as helping businesses to produce renewable energy technologies through subsidies or taxes, is difficult to implement and generate very large costs, from a social point of view.

- **The effects of competition:** Another important concern is the recipe for a division of labor caused by the policy of reducing the gap between the top regions and the regions lagging behind, due to the assumptions about the role of technology in traditional or peak sectors. A policy that targets public research and development in a field such as agriculture can deepen inter-regional disparities by reducing competition and market / performance-based selection. Indeed, a certain "duplication" is a secondary effect of competition and can be societally beneficial.
- **Decrease in yields:** Another concern stemming from the concentration of R & D investment is that of "declining profitability" of R & D.

To alleviate some of the preoccupations of smart specialization, scholars and policy-makers emphasize that it is a vertically-oriented political framework for setting priorities at regional level that combines the bottom-up process and vice versa in setting priorities for public investment in knowledge. They also emphasize that smart specialization depends on general policies (eg competition, trade policy, labor market policy and education and skills) and horizontal innovation policies (eg R & D tax credits). Action strategies can be applied equally to all activities that relate to different types of innovation support, and which can have effects in industry, education, etc. An important issue is then selecting the relevant areas where the government will focus its efforts.

The general principles of a smart specialization strategy in the context of regional development and governance can be summarized as follows:

Focusing public investment on R & D and knowing the specific activities is essential for regions / countries that are not leaders in any of the major scientific or technological fields. Previous policies tended to promote "investment in knowledge" to a limited extent (eg higher education and vocational training, public and private sector research and development), without having much impact on any field. However, focusing on smart specialization refers to the concentration of knowledge-based investments on "activities" - those "business functions" carried out by firms whose activity varies from product design to end-use and beyond (for example design, production and support for the end consumer). These activities (eg goods or services) can be undertaken by a single firm or split between different companies (suppliers) and concentrated in one location or spread across global value chains (OECD, 2013).

Intelligent specialization is based on a **process of "entrepreneurial discovery"** and identifying areas where a country or region excels or has the potential to excel in the future. It will enable entrepreneurs who are able to combine the necessary knowledge about science, technology and engineering with market knowledge, with the potential to identify and invest in the most promising activities. In this learning process, entrepreneurs must play a leading role in discovering promising future areas of specialization, as adaptations required for local skills, materials, environmental conditions and market access conditions are unlikely to be based on knowledge and, instead, will involve the collection of localized information and the formation of social capital assets. An implication for policy-makers is that this requires the provision of political tools for collecting "entrepreneurial knowledge" embedded in the region to turn them into political priorities. In this context, entrepreneurs are not just people who create new companies, but also innovators in established companies, in academia or in the public sector.

Specialized diversification involves concentrating and allocating resources to specialized activities that provide a comparative advantage based on the differentiation of operations and products across global markets.

The specific properties of general purpose technologies (GPT) are the basis of "smart specialization." The invention of a GPT extends the frontier of inventive possibilities for the whole economy, while "co-invention of applications" changes the production function of a particular sector. These regions are important for upstream and downstream upgrading of the value chain. Top regions invest in inventing a GPT or a combination of different GPTs (for example, bioinformatics). Regions must not "imperatively" drive these technologies to their benefit. In fact, adherent regions are often advised to invest in "co-invention of applications" around a GPT. Benefits of GPTs in general also require coherence with education and training policies to build capacity.

Coordination of multi-government and regional and interregional policies: establishing common objectives for the development of regional strategies and adequate allocation of public funds. Smart specialization strategies are, by their nature, linked by complementary activities at a horizontal level and require a horizontal policy coordination. But they are especially co-defined by the "vertical" alignment of entrepreneurial activity, group partnership, regional development strategy and interregional and international agreements, which are part of a multilevel governance structure for a smart specialization. Therefore, setting common goals is a powerful governance mechanism for vertically aligning these strategies without jeopardizing the process of market-oriented allocation of resources. This coordination of multilevel governance requires the

synchronization of both national strategies with regional strategies and the synchronization of different regional strategies (eg innovation strategies, research strategies, industrial strategies) to support regional priorities.

Models of structural change: Structural changes, not just capital accumulation, are a factor of economic growth. Because of this, smart specialization aims to accelerate structural change by encouraging the transformation of economic activities from a structural perspective. This may mean, in some cases, the modernization of existing industries or the possibility for long sectors to improve their competitiveness through the adoption of ICTs, but new frontier zones may be developed for the countries at the forefront.

Since 2009, due to the global financial and economic crisis, the concept of smart specialization has gained new meaning in the debates on New Industrial Policy, New Growth Sources and New Approaches to Economic Challenges. For example, the Organization for Economic Co-operation and Development (OECD) has recommended member countries to address the smart specialization process from the following points of view:

- at structural level, the OECD urged member countries to analyze the structure of national and regional activities in order to make the economies more competitive;
- at the social level, to tackle inequality and lack of jobs;
- in an environmentally-friendly way, to promote a growth path that takes actual account of environmental constraints;
- at institutional level, to tackle the current shortage of trust in institutions and markets.

Smart specialization presents a series of frameworks / actions / strategies that adapt many of these objectives, focusing on promoting structural change in the economy, investing in knowledge-based assets and better governance in the policy-making process of ITS policies. Although smart specialization has emerged in the EU context of market integration, regional cohesion and the European Research Area, similar strategies which are based on targeting public investment, and top-down and bottom-up initiatives are also visible in other regions and states, such as in Australia, Michigan or California in the United States, Korea and Singapore.

Strategies to concentrate investment in knowledge-based assets, on specific activities, through a process led by entrepreneurs, have also found a fertile base in a large number of OECD member states as a result of the confluence of different developments. On the one hand, many OECD countries have entered a period of slow growth, high unemployment, falling demand and high public deficits, and innovation has become the key to relaunching growth and investment, in particular

GPT), which are seen as ways of revitalizing existing industries and stimulating downstream innovation, including service innovation (eg ICT for public health).

On the other hand, globalization and progress in ICT enable companies to fragment their output into the global value chain. Therefore, the relevant unit in economic analyzes is not industry or sector, but "business function" or "activity" along the supply chain (eg design, research and development, procurement, operations, marketing and customer service). Countries tend to specialize in certain "business functions" or "activities" rather than in certain industries (for example, assembly operations for China or business services for India). This increase in GVC illustrates why specialization is no longer only in industries but in certain functions or activities specific to the value chain (OECD, 2012).

At the same time, the crisis has also highlighted the vulnerability of global value chains to supply and demand shocks, and has also forced OECD governments to look more closely at where economic value is created within global value chains and whether knowledge transfers can be capitalized and maintained at regional, local level by strengthening the links between local and foreign actors. Regional development and, above all, "local growth" are considered to be particularly important in innovation and specialization strategies, given the share of agglomeration savings (OECD, 2011). **The smart specialization approach responds to the need to better position regions / regional clusters in global value chains, also in the case of regions where local and regional production systems are more relevant.**

According to the Organization for Economic Cooperation and Development, each country's **governance and regional development strategy** should be based on:

- *promoting and developing entrepreneurship*, supported by a very good selection of entrepreneurial initiatives implemented in each region. The smart specialization approach requires an "entrepreneurial selection" of market opportunities (for example, to minimize failures and to avoid inappropriate policy decisions).
- *promoting platforms and networks of general purpose technology (GPT)*. Taking into account the range of applications of general purpose technologies, technology platforms involving public and private actors, as well as the organization of standards settings, can boost productivity in existing sectors, or help to identify or identify sectors where resources are concentrated.
- *Planning with tools and infrastructures based on diagnosis and indicators*. Smart specialization requires regions and countries to maintain an infrastructure and an

indicator base. Also, in most technological areas there is a match between technological and economic performance. However, there are cases where some areas are economically strong in the country, but from a technological point of view they are very poorly developed. This information could help decision makers assess the sustainability of traditionally strong sectors or highlight areas where research capacity is high but the level of economic development is low. Also, new activities can be identified that match the existing capacities in the region, although these opportunities have not been capitalized before.

- *Strategic governance for smart specialization.* Three types of strategic capabilities are needed to understand future opportunities:
 - the ability to identify strengths throughout the development region;
 - the ability to align political actions and build a critical mass;
 - the ability of regions to *develop a vision and implement the strategy*.

Therefore, the role of strategic intelligence as a tool for governing smart specialization is important. In practice, the link between policy instruments and prioritization is not explicit in the vast majority of regions and countries. Many decision-makers find it difficult to move from "the prioritization process" to the process of developing policy instruments and the corresponding budget. In most cases, the prioritization process is disconnected from the budget process. Additional governance challenges arise in creating two-way communication channels, attracting and employing qualified staff in agencies and ministries (this is a major challenge especially for smaller and more remote regions, in the context of constraints on public finances and public sector employment).

Opening up to other regions: The region's specialization strategy should integrate the fact that other regions are also involved in knowledge-creation activities and that duplication could lead to less efficiency and, ultimately, failure. Therefore, cooperation opportunities with other regions with complementary capabilities and strategies should be identified (eg the cross-border cooperation of Brainport Eindhoven in the Netherlands with Leuven in Belgium on ICT and LifeTec & Health).

While such strategies provide a specific way to trigger the spillover effects and cluster policy networks, smart specialization policies also aim to overcome these policies, highlighting the interaction between framework conditions and innovation policies needed to accelerate structural

change by deepening existing capabilities, but above all by creating new capabilities. The key to this is the focus on developing clusters around key enabling technologies.

In regions with high innovation capabilities, with a rich network of well-organized institutions and stakeholders, one of the key challenges for policy-makers is how to make a balanced choice of **'smart' priorities**, taking into account strengths, as well as flexibility and openness to new opportunities. In many such situations, public R & D investment is geared to a large number of priority areas. In less advanced regions, the main challenge is to provide the appropriate framework conditions to build capacities to stimulate entrepreneurial development, as well as to mobilize stakeholders to interact with and / or cooperate with the government. In such regions, more generally, generic, general policies are implemented rather than policies specific to the field of innovation.

Translating into practice the regional development strategy and smart specialization generates many problems, especially from the point of view of harmonizing objectives and developing specific policies. Governments often do not start from scratch and do not adapt the set of policies available to the new strategy. In many situations, the regional authorities are trying to streamline the architecture of regional development policies and their correlation with the smart specialization strategy. It should also be noted that policy simplification also contributes to better prioritization of the action lines and areas of intervention.

There seems to be no specific policy tools for smart specialization. Practical experiences illustrate how regions and countries use the "traditional" set of innovation policy tools and adjust their mix of policies to address specific areas, challenges and opportunities. What is specific to smart specialization is focusing on entrepreneurial policies, cluster development support, including facilitating bottom-up strategic processes within a wider mix of policies. A critical impact solution, but also difficult to implement for the smart specialization and prioritization, is the removal of support for certain activities. This raises dissatisfaction within certain groups of stakeholders who expect to receive support from their government. For example, in Lower Austria, two cluster initiatives initially benefiting from public support have been abandoned due to the low support provided by companies active in their sectors. Practical experience demonstrates that in many situations the criteria for selecting certain areas or activities are difficult to define and are not always very clear and transparent. In addition, in some cases, various government actors in a country or region engage in more strategic processes without coordination, leaving room for a broad interpretation of policy prioritization.

Studies conducted in the field of smart specialization and regional governance clearly highlight the fact that it is not only entrepreneurs who are creating new businesses. In terms of innovation, the role of entrepreneurs in this field can also be met by academia, research organizations, networking associations, etc. and needs the organizational power and the firm commitment of all parties involved in the regional development process. If structural change is the goal of smart specialization strategies, it is necessary to assess and facilitate the expansion of individual potential "discoveries". A good that should not be underestimated is the social capital available in the regions. Self-organization of clusters and other "free networks", the desire to cooperate and develop joint processes and direct interaction between governments and stakeholders has proven to be very important in dynamic regions.

The need to develop links with regions and nations across borders is evident in most countries. The internationalization of businesses and individual groups is on the political agenda. However, reality shows that the implementation of common strategies in the field of smart development is affected by a number of obstacles. Although important progress has been made in collecting data and developing indicators to monitor the innovative performance of regions and countries, there is still a challenge to develop adequate evaluation frameworks for smart specialization strategies and policies. Most of the evaluation efforts are program-oriented and project-oriented. The impact of these policies is largely long-term and difficult to assign to the overall process of strategy development and implementation.

2.1.5. The Regional Innovation Consortium and its role in the context of regional governance

The partnership structure proposed to coordinate the governance of the Regional Framework Document / Smart Specialization Strategy of the South-East Region during 2014-2020 will be called the Regional Innovation Consortium.

The Regional Innovation Consortium (RIC) is a consultative structure, without legal personality, coordinated by the South-East Regional Development Agency, consisting of academic and research institutions, innovative enterprises, public authorities and civil society representatives, with a role in advising and monitoring the RIS3 Strategy awithin each development region, endorsing the regional framework document elaborated for the programming of the Axis 1-Technology Transfer Promotion, the Regional Operational Program (ROP) 2014-2020, approving the RIS3 Priority Portfolio for each region, analysing analysis and prioritizing projects for innovation and technological transfer structures, according to Axis 1, ROP 2014-2020. The number of members of

the Regional Innovation Consortium is up to 40 persons and the proposal regarding its structure is presented in Annex 2 to this Strategy - Indicative list of member institutions in the Regional Innovation Consortium (RIC).

The role of the Regional Innovation Consortium is to:

- provide feedback on the structure and mix of policies included in South-East RIS3 Strategy;
- approve the South East RIS3 Strategy;
- approve the Regional Conceptual Note elaborated for the programming of the Axis 1, ROP 2014-2020;
- endorse the portfolio of priority projects of the South East RIS3 Strategy;
- analyze and prioritize the projects for the innovation and technological transfer structures, according to Axis 1, ROP 2014-2020;
- proposes estimated date of possible processes for updating / reviewing the South East RIS3 Strategy;
- helps to identify the sources of information needed to monitor and evaluate the South East RIS3 Strategy;
- proposes possible structural and legislative changes;
- proposes and monitors interregional cooperation initiatives;
- endorses the Annual Implementation Reports of the South East RIS3 Strategy;
- identifies and attracts funding sources for the South East RIS3 Strategy evaluation studies.

The Regional Innovation Consortium comprises representatives of the following categories of institutions / entities / organizations:

- **Research / education:**
 - State accredited higher education institutions and their research and development structures;
 - School Inspectorates;
 - Research and development institutes;
 - Research and Development Institute, operating (headquarters or subsidiaries with legal personality) in the South-East region;
 - Institutes, centers or research-development centers subordinated to the Romanian Academy or branch academies;

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- Other institutes, centers or research-development centers, organized as public institutions;
- Other public or public law institutions which have research-development as their object of activity or legally constituted structures associated to the subject;
- Institute or research-development centers without patrimonial purpose, recognized for public use;
- Other institutes, centers or research-development centers, organized as legal entities of private law, without patrimonial purpose;
- ***Entrepreneurship:***
 - Cluster management entities;
 - Technological transfer entities;
 - Companies that have RDI activity;
- ***Public administration:***
 - Local public authorities;
 - Metropolitan areas;
- ***Civil society / users:***
 - Associations and employers' federations of the areas identified as competitive in the development region in which the consortium is constituted;
 - NGOs / CCIA;
 - LAGs / FLAGs;

The tasks of the Regional Innovation Consortium and its members are established in accordance with the provisions of the Methodology for the elaboration of the Framework Document for the Strategy for Regional Innovation and Research for Smart Specialization issued by the Ministry of Regional Development and Public Administration (MDRAP) on 29.06.2016 and with the Implementation Mechanism for Priority Axis 1 Promotion of Technological Transfer, Regional Operational Program 2014-2020, issued by MDRAP on 08.06.2016:

- a) participates and provides views, suggestions and observations in the consultation process on the elaboration and updating of South-East RIS3 Strategy;
- b) approves the Regional Framework Document elaborated for the programming of the Axis 1, ROP 2014-2020;

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- c) analyzes the portfolio of priority projects of South-East RIS3 Strategy;
- d) monitors the RIS3 strategy and how it is implemented at regional level;
- e) contributes to identifying the sources of information needed to monitor South-East RIS3 Strategy;
- f) provides information on the projects implemented at the level of the development region in accordance with the RIS3 priorities;
- g) proposes possible structural and legislative changes necessary for the implementation of South-East RIS3 Strategy;
- h) informs the management of the institution that it represents about the tasks and activities carried out within the RIC and ensures that its position in relation to the decisions, documents debated or elaborated within the RIC, is consistent with the official point of view of the institution / organization which is represented within the RIC;
- i) disseminates to the other institutions and organizations with which they are in institutional relations the relevant information related to the activity of the Regional Consortium, priorities and measures in South-East RIS3 Strategy;

The selection of the representatives in the RIC will have the following stages:

- identification by South East RDA of entities active in the process of entrepreneurial discovery and preparation of a list of proposals (categories of entities with possible applications);
- publishing this list of proposals on www.adrse.ro for public consultation;
- the submission by the RDA of invitation letters for the nominated institutions and the publication of an announcement on www.adrse.ro on the open call for applications for the appointment of persons, members and alternates in RIC;
- the collection by South East RDA of fax and e-mail applications;
- activation of the selection board for the applications received;
- selection of applications based on administrative, eligibility and quality criteria;
- approval of the composition of the RIC by the South East Regional Development Council;
- publication of the final results regarding the appointment of the members and alternates in the RIC and the RDC component.

The organization and operation rules of RIC are approved by its members in the first Consortium meeting.

2.2. Quality of governance

The concept of "quality of governance"

The quality of governance is a relatively new concept that has become more and more important, becoming one of the most important and used indicators to measure the economic and social progress achieved in a region.

According to specialized studies, "quality of governance" is the major determinant of several variables associated with the welfare of individuals in a country / region. Although the number of studies and initiatives to assess the quality of governance is relatively low, the literature defines "governance quality" as an expression of how a government provides the citizen with the strategies, policies and development priorities of a country or region. Essentially, it is about the quality and added value that those strategies and policies can create at a region's level, and less about their quantitative dimension. The quality of governance is the best way to highlight the context in which a national or regional government implements its strategies and policies in an efficient, impartial and non-corrupt manner. In recent years, interest in the concept of "quality of governance" has become increasingly academic in the first place, as evidenced by the large number of publications dealing with this topic. On the other hand, the quality of governance is a very good indicator that can be used to measure the good governance and health of public institutions from the perspective of the development process. This latter aspect is highlighted by the fact that a growing number of national and international institutions are conducting studies on the quality of governance. In this respect, a number of working tools and indicators have been developed, which help to collect and quantify data and information on the quality of governance. However, it should be noted that some of the information has a very subjective character, based on citizens' perceptions of corruption control, the rule of law, and "bureaucratic quality" or "government effectiveness."

The basic factors defining the quality of government of a country or region concern the public sector, the protection of property rights, the existence of sound and impartial rules and the effectiveness in impartial management of public goods and services. Starting from this approach, many specialists claim that the theoretical foundation of this concept is impartiality - all citizens are treated equally by the state, regardless of gender, age, ethnicity or religion. That is why the measurement of the quality of government should be based on what the government of a country or regions is doing and whether it provides all citizens with impartial services and policies.

As with many latent social science concepts such as "quality of life" or "freedom", the concept of governance quality and its subcomponents can not be measured directly and is often based on subjective perceptions of citizens. For example, corruption is clandestine, and impartiality is difficult to analyze simply by simply referring to the country's legal code. The general principles of the quality of governance are based on the perceptions and experiences of public sector citizens, and the extent to which people are treated impartially, without corruption, while receiving quality services delivered in an efficient manner.

Measuring the quality of governance

Studies on the quality of governance highlight the fact that in the countries / regions with a high quality of government, citizens' welfare levels are high, being members of an efficient economy and providing a high standard of living with education better, higher-level healthcare and research-innovation outcomes.

Although "governance quality" is a relatively new and current concept, both from the point of view of specialists 'concerns and from the point of view of the way in which governments put their resources and strategies for economic and social development at the service of citizens' welfare, data and information on the quality of governance and its measurement are not very numerous. There is an acute shortage of data and information, especially as regards to the quality of governance at regional level. This is because the studies conducted have focused exclusively on the national level, focusing on developing countries, considering that national differences are much more important than those at regional level, and the differences between regions in Western countries are quite small. In recent years, increased attention has been paid to regional differences research, as it has been found that even in Western countries there may be significant gaps between regions.

The main indicator to help measure the quality of governance at European level is the **European Quality of Government Index (EQI)**. The data and information used to calculate the value of the European Quality of Governance Index is collected through surveys conducted at regional and / or national level by research institutes, national and international non-governmental organizations. Moreover, depending on the degree of specialization of research on governance, research institutes or governmental organizations have developed specific indicators to measure "good governance", such as: World Governance Indicators (WGI), the Corruption Perception Index CPI (Transparency International).

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The studies on the quality of governance at the level of the 27 EU Member States highlight four groups of states grouped according to the quality of governance. Romania and Bulgaria form the fourth cluster of countries according to the quality of governance.

Secondly, the quality of government can be influenced by the size of a region (population number, area of that region), and social trust is always associated with the quality of governance. Last but not least, the administrative system of a country, namely the degree of political decentralization (regional administrative authority or federalism), is associated with the quality of regional governance and the existence of disparities between regions of the same country, considering this point of view.

The quality of governance is measured on the basis of four pillars:

1. Corruption control;
2. The rule of law;
3. Government efficiency;
4. Responsibility

Also, the World Governance Indicator is calculated for all European Union Member States, and their ranking according to the values of this indicator is shown in the table below:

Table no. 25 Ranking, by cluster, of the EU Member States according to the quality of governance

EU ranking	Global ranking	Country	Government Quality Score (QoG) Total	Equivalent Non-EU countries
1	1	Denmark	1.978	Switzerland
2	2	Sweden	1.915	Switzerland
3	3	Finland	1.909	Switzerland
4	6	Netherlands	1.834	New Zealand
5	11	Luxembourg	1.747	Canada
6	12	Austria	1.701	Australia
7	13	United Kingdom	1.628	Singapor
8	14	Irland	1.628	Singapor
9	15	Germany	1.620	Singapor
10	19	France	1.403	USA
11	20	Belgium	1.368	Barbados
12	23	Malta	1.268	Japan

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EU ranking	Global ranking	Country	Government Quality Score (QoG) Total	Equivalent Non-EU countries
13	27	Spain	1.103	Chile
14	28	Portugal	1.084	Chile
15	29	Ciprus	1.077	Saint Lucia
16	30	Estonia	1.043	Saint Lucia
17	32	Slovenia	0.994	Israel
18	36	Czech Republic	0.826	Uruguay
19	41	Hungary	0.759	South Coreea
20	45	Slovakia	0.651	Botswana
21	46	Latvia	0.608	Costa Rica
22	48	Greece	0.574	Cape Verde
23	50	Lithuania	0.563	Cape Verde
24	51	Poland	0.552	Qatar
25	53	Italy	0.480	South Africa
26	74	Bulgaria	0.100	Panama
27	78	Romania	0.059	Ghana

Source: Charron N., Lapuente V., Dijkstra (2012), Rothstein, Charron, Lapuente (2013)

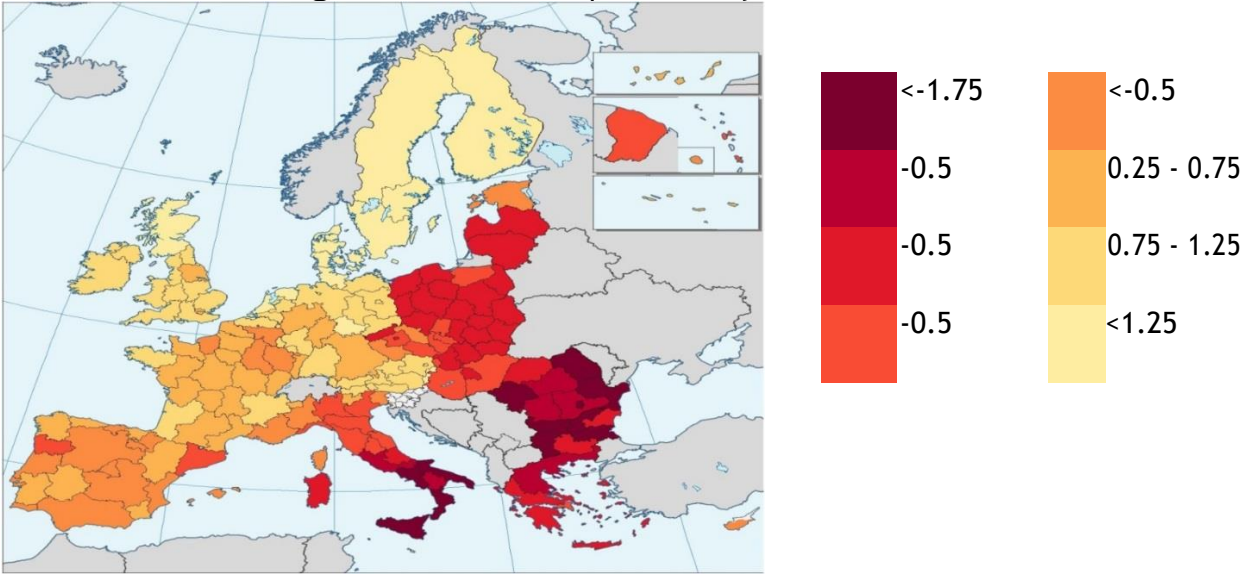
According to the data in the previous table, Romania ranks last in the ranking of the states in the European Union, depending on the quality of government. The underlying causes of such a situation are closely related to the high level of corruption registered in our country and highlighted by the European institutions in different country reports. The functioning of the rule of law is also frequently affected by political, bureaucracy and corruption decisions. Regarding the quality of global governance, it is highlighted that in this regard, Romania is very close to countries such as India, Ghana and Colombia, which are considered countries with low quality governance.

În an attempt to provide a common reference framework and a common methodology, on the basis of which the national score can be calculated, and to allow comparisons between countries or regions, the studies on the quality of governance at EU level the focus on three types of services that citizens benefit from and which are managed by the state. These are education, health and law enforcement services, with a range of issues related to how they are funded and administered politically and administratively at national and regional, county or local levels. In the opinion of the specialists, the three public services are essential to assess the quality of governance in a country or region and allow regional differences to be highlighted to a sufficiently relevant level.

As far as Romania is concerned, the only region considered to have a quality of government above the EU average is the North-West region. The Central and Northeast regions are considered to have a satisfactory governance quality, weaker than the Northwest region and below the EU average. The good quality of governance in the North-West region is supported by the level of high economic development recorded in the region. From the point of view of the quality of governance, the Northwest region scores 1.03 in the European Quality of Governance Index. The North-West region is coming from the point of view of the quality of governance from the regions of Sardinia (Italy) and Prague (Czech Republic). However, in terms of combating corruption, the North West region scores the lowest score among all regions in the EU member states, at which the "Study on Quality of Governance and Corruption from a European perspective" (Charron, 2013) was conducted, the score on the anti-corruption component 3.12. The Bucharest-Ilfov region, although considered to be the most developed region in Romania, has the weakest quality of governance among all regions of Romania, the value of the European Governance Quality Score being negative, EQI -0.12.

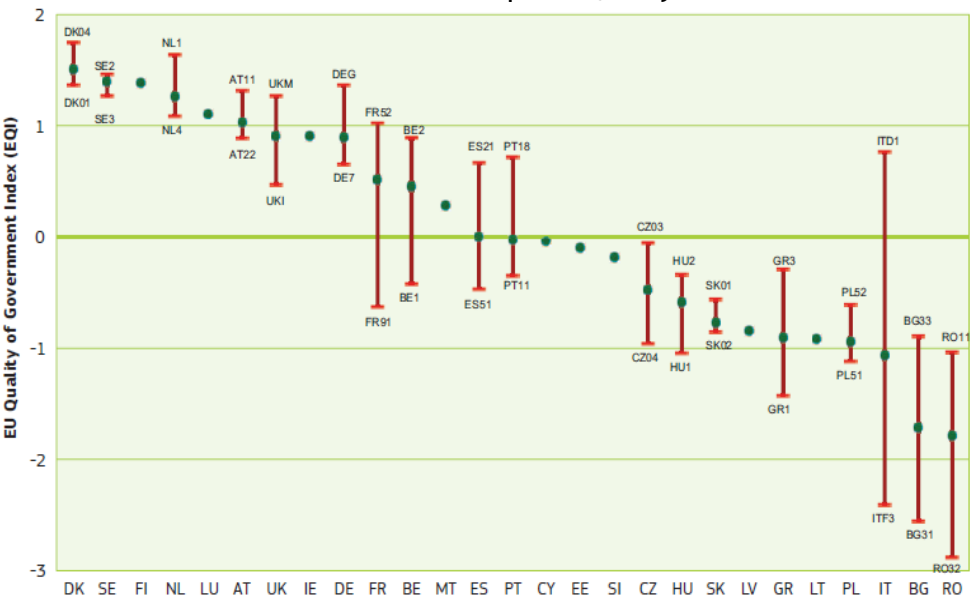
According to the "Study on Governance Quality and Corruption from a European Perspective" (Charron, 2013), Romania resembles Italy, given that there are significant differences between the regions in terms of the quality of governance. The North-West Region is considered by investors as one of the most attractive regions in Romania. According to the estimates of the National Prognosis Commission, the Bucharest - Ilfov Region will record in 2017 a GDP per capita of 19,926 euros. For the South-East Region, CNP estimates 7,655 euros, for South Muntenia - 6,646 euro, for South-West Oltenia - 6,377 euro, West - 8,951 euro, North-West - 7,478 euro and Center - 8,090 euro. As for the unemployment rate, the highest percentage could be registered in the South-West Oltenia region, namely 8.1%, followed by South-East and South Muntenia by 6.6%, North-East by 6 , 3%, Center - 4.7%, Northwest - 3.5%, West - 3.2% and Bucharest - Ilfov - 1.8%.

Figure no. 165 European Quality Governance Index



Source: Charron, Lapuente, Dijkstra 2012

Figure no. 166 Governance Index of European Quality - Differences between Regions



Source: Charron, Lapuente, Dijkstra 2012

Analyzing the data presented in the previous tables and figures, it can be seen that countries with a high quality of governance are generally countries where the level of human development is high. Secondly, the impartiality of public institutions and the proper functioning of the institutions of the rule of law contribute to increasing the quality of governance in those countries. In conclusion, we can say that there is a direct relationship between the quality of governance in a country / region and the level of its economic and social development. The higher the level of economic and social development, the better the quality of government.

It can also be seen that countries with a higher quality of government are economically and socially developed, but they are low-income countries compared to other countries such as Germany, France, Romania, Spain, Poland . With regard to the demographic factor (population), it can be said that countries / regions with a small population are easier to administer and run through good laws, compared to countries / regions with a very large population.

Types of regional government

In general, national authorities have a major impact on the process of regional governance and, in particular, on the quality of governance. National authorities intervene in economic, social, administrative and cultural development through a large number of instruments that regulate the taxation system, the labor market, the functioning of the rule of law institutions and the business environment. Depending on the way in which national authorities intervene at regional level, there are several types of regional government:

- Governance by authority;
- Governance through provisions;
- Governance by providing opportunities;
- Self-governance.

Governance by authority

Authoritarian governance is characterized by the fact that the regional / local development objectives and priorities are centrally stabilized and fully implemented at local level, without taking into account the specificities of that region. Local / regional authorities / collectivities can not take decisions or acts without consulting the central authorities or without even asking for their approval.

Western Greece is a relevant example where the legislative powers are centralized at national level, so regions can be considered as "governed by authority". The specificity of this type of

government is the fact that the central level limits the action directions existing at the level of the region. Therefore, the region is not considered a key agent, but rather a supporting actor. The design of funding strategies and functions is mainly national competences. The responsibility of regional and local levels of governance in SMEs and entrepreneurship policy is to a large extent linked to a representative role and advisory activities. However, they have certain competences in several relevant areas, such as ERDF planning and programming, employment, social policies, etc. Most often, regional and local institutions are consulted by national authorities in the development phase of the strategy.

Governance through provisions

Governance through provisions is characterized by the existence at regional level of bodies, institutions representing the interests of enterprises and employees in the region but also of local communities and having the freedom to take action and the power to make decisions when it comes on the implementation of regional development strategies and policies. The active involvement of strong regional actors has as their main effect the improvement of communication between the central and the regional level, the assumption of responsibility and the proactive involvement of local communities in the regional development process. Local communities receive support and are always consulted on the development of the strategy at regional level. This type of governance allows for the implementation of inter-regional cluster development strategies.

The governance of the Helsinki-Uusimaa region relies heavily on regular interactions and is highlighted by the importance of exchanges of resources and services. In particular, the reciprocity of funding exchanges is highlighted. Also, this type of government focuses on encouraging initiatives and ownership of tools used to optimize and effectively achieve regional strategy and policy objectives. As a result of decentralized administration, the region has administrative powers and duties. Local authorities also have regulatory powers.

Governance by providing opportunities

The main feature of governance through the provision of opportunities is the existence of regional authorities with autonomy in the design and implementation of regional policies. For example, in the Flanders region of Belgium there is a parliament and a regional government. In the case of governance through the provision of possibilities, the decision-making control is held at regional level and not at central or local level. Thus, specific policies can be developed and implemented at the regional level on employment, investment promotion or the development of small and medium

sized enterprises, tailored to the specific needs and needs identified at the level of the region. At regional level, each category of organizations / bodies with an important role in the regional and local development process (municipalities, entrepreneurs' associations, employment agencies, local and regional councils, banks / investment funds, etc.) .

In Northern Ireland, the regional governance strategy envisages the possibility for the 11 regional councils to implement and adapt the SME development strategy and policies (developed by the NILGA Local Government Association). Moreover, the regional entrepreneurial strategy focuses on the entrepreneurial skills of the members of society. A specific regional education agency (Young Enterprise NI), which implements entrepreneurial programs in schools, has the same line of action. In the UK, there is no complete and absolute transfer of autonomy, but there are exceptions specified in the provisions governing development at local level.

Self-governance

Self-governance is the right and ability of local communities to set general interest objectives, namely local / regional development priorities, to promote their traditions and customs and to approve their investments for public works or the establishment of public services industrial, agricultural, commercial, etc. with a view to sustainable development. Local / regional authorities may take decisions or acts without consulting the central authorities or without asking for their approval.

In South Denmark, all stakeholders involved, ie regional and local authorities, as well as research institutions and universities and, in particular, businesses themselves, form a single body. The "Growth Forum" is responsible for SME policy and entrepreneurship through initiatives in the area of entrepreneurship, education and employment policy. It is currently the most prominent example of self-government available in Europe.

Conclusions

Although the concepts of "regional governance" and "quality of governance" are relatively new, concerns about defining them, and especially their quantification, are becoming more and more numerous and attract the attention of an increasing number of specialists.

Specialist studies highlight the fact that superior governmental quality in a country or region is the expression of the welfare level of the population in that country / region. The quality of governance is influenced by a number of factors such as:

- The level of economic and social development;

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- Degree of administrative decentralization and decision-making;
- The functioning of the institutions of the rule of law;
- Corruption control;
- Effectiveness of government strategies and policies;
- The cultural dimensions of the analyzed country / region;
- The demographic situation of the country / region;
- Area / size of country / region

From the point of view of the quality of governance, Romania ranks last in the ranking of the member countries of the European Union, being surpassed even by Bulgaria. Of the eight development regions existing at the level of Romania, the North-West region has the highest quality of government, while the opposite is the Bucharest-Ilfov region (Table 2), which has the lowest level of government quality, although it is the most economically and socially developed region, but the functioning of the rule of law institutions is flawed and the control of corruption is reduced.

Chapter III. Development of a global vision for the future of the region

The smart specialization of a region encompasses a collective process of knowledge based on the results of the ability to attract, generate and transfer knowledge and information, involving the different categories of stakeholders in the region.

Moreover, the region's smart specialization must be built on a sound analysis of regional assets and technologies and must be based on a strong partnership between businesses, public entities and knowledge institutions - such partnerships are recognized as essential for success.

In order to develop a vision for the smart development of the South-East Region, desk and field research activities were carried out at the level of the South-East Region, involving key actors from the region (representatives of the quadruple helix), attempting a strategic approach to economic development through specific support for research and innovation in specific areas. Thus, the identification of areas with significant strategic potential, the development of stakeholder governance mechanisms, the establishment of strategic priorities and the use of smart policies to maximize the knowledge-based development potential of the South-East Region were sought.

In order to have a significant impact on the economic development of the region, the smart specialization strategy must focus on a limited number of areas with innovation potential so that they are properly developed and capitalized in order to generate a considerable impact on the region and to produce greater added value in the territory.

The purpose of this smart specialization strategy is to identify those areas where the South-East Region can develop by capitalizing on research, innovation, and science, so as to make a significant contribution to increasing the competitiveness of the region. Smart specialization priorities, which will be detailed in the next chapters, will encompass areas with competitive, real or potential potential that will directly contribute to increasing the innovation and development of the region by mobilizing material and human resources in the field of research, thus reaping the specificities of the South-East Region.

Thus, in the future, the Southeast Region is to become competitive by capitalizing on research, development and innovation results, and by creating long-term partnerships between research organizations and the private sector that become functional and focused on around science and

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technology research infrastructures and programs. By capitalizing on the results of research carried out by academic institutions, entrepreneurship based on innovation can be activated, which will lead to the development of the region and increase its competitiveness.

The smart specialization vision for the South-East Region, which is created for a defined time frame, is designed to provide a general context for regional decision-makers through which they can plan their future development actions using tools and appropriate techniques to guide development efforts towards those areas identified as having regional innovation potential.

The development scenarios analyzed for the South-East Region represent the starting point for developing an appropriate vision in the field of smart specialization, which is to substantiate the proposed innovation priorities and the specific objectives associated with them.

This vision aims to create a future scenario for the region, presenting its role and position in this future. The vision must be broad enough to accommodate realistic priorities and specific development methods, for economic renewal and transformation of the region.

In creating the smart specialization vision of the South-East Region, the analysis and adoption of one of the three categories of scenarios was the main starting point:

- Development based on the current benefits (testing the results of science, applying state-of-the-art technology or a mix of them);
- Socio-economic transformation (through reconversion, identification of new frontiers);
- Recovering gaps: by creating knowledge-based capabilities / abilities.

Development scenario	Development scenario description
Development based on the current benefits (testing the results of science, applying state-of-the-art technology or a mix of them)	Scenario no. 1 presents the development potential of the region, starting from the current status of economic diversification and the full utilization of the current skills of the labor force present in this region, also bringing the latest technologies in order to increase the level of innovation and create a baselin that can be built on during next generations.
Socio-economic transformation (through reconversion, identification of new frontiers)	enario involves diversifying economic development for the South East Region by identifying new economic opportunities from both the business and the workforce. Transforming the region's resources into high added-value products and services will also have positive effects across the region, bringing its competitiveness to a European and global scale. The region can thus

Development scenario	Development scenario description
	ensure a socio-economic sustainability at national level by raising GDP per capita and bringing prosperity in the long run.
Recovering gaps: by creating knowledge-based capabilities / abilities	Scenario no. 3 aims to reduce the development gaps in the region by recovering the gaps from other development regions of Romania, relying primarily on the acquisition of new skills for the South-East Region labor force. Knowledge-based skills in other regions is a determinant of the socio-economic development gaps compared to the South-East Region

Selection of development scenario for the region

Taking into account the three scenarios that could be adopted for the intelligent development of the South East Region, as well as a number of factors that condition the implementation of this strategy at a regional level (such as the current level of development of the region, the applicability of the scenario at regional level , the proposed timeframe for implementing the strategy's initiatives), it was identified the best development scenario for the South-East Region, based on the information in the following table.

In order to measure the relevance of each factor that influences the development of the region, a scale of 1-3 was used where 1 - less relevant, 2 - relevant to some extent, and 3 - very relevant.

Development scenario	Current level of development of the region	Applicability of the scenario	The target time frame	Relevance of the scenario
Development based on the current benefits (testing the results of science, applying state-of-the-art technology or a mix of them)	1	3	2	6
Socio-economic transformation (through reconversion, identification of	1	1	1	1

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Development scenario	Current level of development of the region	Applicability of the scenario	The target time frame	Relevance of the scenario
new frontiers) Recovering gaps: by creating knowledge-based capabilities / abilities	1	2	2	4

Thus, the proposed scenario for the South-Eastern Region envisages the development of the region on the basis of the current advantages, specifying that it is recommended to implement integrated initiatives by involving all categories of relevant actors at regional level, to capitalize the competitive advantage of the region and to guide actions at territorial level to those areas considered to bring added value to economic activity in the region.

Existing potential in the economic sectors within the region

Taking into account the existing potential in the economic sectors of the region and in order to present the optimal development scenario for the South-East Region, the development scenario of the region will be described from the economic, socio-demographic and research perspective, considering the initiatives to be implemented towards smart specialization. The projected scenario targets 2023 and aims to present realistic objectives, with development forecasts being grounded in the analysis of the trend driven by the evolution of the socio-economic indicators, analyzed up to the last available year, and by the foreseen impact of the strategy implementation.

In order to establish the projected targets for 2023, the characteristics of the region and its development potential were taken into account, the evolution of the indicators being realistically predictable, following the same development trend as in the last years analyzed.

Thus, the development scenario for the South East Region for the following years is presented below.

Analyzed indicators	Current situation	Foreseen development for 2023
GDP	At the level of the South East Region, the Gross Domestic Product (GDP), expressed in millions of lei, was 75,239.3 million lei in 2014, which represents 11.26% of Romania's GDP and about 0.12% of the EU 28 GDP.	The economic development of the South East Region is also supported by the orientation of regional initiatives towards the research and development areas. The focus of the action plan and of the investments at the level of the areas of specialization proposed within

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Analyzed indicators	Current situation	Foreseen development for 2023
	The South-East region is ranked fourth in terms of regional GDP, the level recorded in 2014 being 2.3 times lower than the GDP of the Bucharest-Ilfov Region, the most developed of the eight regions of the country.	the strategy will contribute to the increase of the RDI activities' importance in the economy of the region. By implementing the measures and actions proposed by this strategy, it is forecasted that in 2023, the region's GDP will increase with about 30% compared to the region's value in 2015.
Active local units	From the point of view of the number of active local units, the South-East Region ranks fourth at national level, with a total of 59,845 active local units. The areas of activity in which most of the local units active in 2015 in the South-East Region are: Wholesale and retail; repair of motor vehicles and motorcycles (22,529), Manufacturing (5,509) and Transport and storage (5,405).	Real and sustainable economic growth is generated by the continuity of investments in competitive areas at regional level. It is envisaged that the active local units will contribute to the development of research, development, innovation, in a more sustained and continuous environment, which is why their presence within the South-East Region is an important factor for increasing the regional competitiveness. Following the implementation of the initiatives proposed by the present strategy, in 2023, the number of local active units will increase by about 8% compared to the value recorded in 2015.
Innovative businesses	In the South-East Region, the number of innovative enterprises decreased from 1108 in 2012 to just 560 in 2014. According to Inobarometer 2011, the South-East Region had an innovation degree of 28.84%, being on the 5th place at national level.	The number of innovative enterprises in the South East Region is an important conditionality for the region to become innovative, competitive and knowledge-based. For this reason, and taking into account the evolution of the indicator on the number of innovative enterprises in the South-East Region during the analyzed period, the value of this indicator is expected to increase by approximately 2.5 times compared to the value from 2014.
Expenditures for RDI activity	In the Southeast Region, during the period 2010-2015, R&D expenditures decreased from 89,095 thousand lei in 2010 to only 63,871 thousand lei in 2015. Moreover, the South-East	In order for the region to become more competitive at national and European level and to achieve a higher degree of innovation, it is necessary for it to increase its spending on research,

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Analyzed indicators	Current situation	Foreseen development for 2023
	Region is the region with the lowest R&D expenditures in Romania. Among the main explanations of this situation, which can be identified without a detailed analysis of the causal factors, are: the reduced number of institutions whose main object is research and development, the small number of researchers and personnel involved in research activities, the low number of competitions to obtain funding for research activities, the low interest of business companies in the region for research and development activities.	development and innovation in the coming period. As demonstrated in the socio-economic analysis carried out, there is a direct interconditionality between the increase in RDI spending at regional level and the GDP per capita growth at regional level. Thus, following the implementation of the initiatives proposed by the strategy, in 2023, the value of the research, development and innovation activities is expected to register a 40% increase compared to the 2015 value.
Labor force	The Southeast Development Region ranks sixth in the 2015 level in terms of the human resources employment rate (62.8%), registering higher values only compared to the North-East (57.6%) and South Muntenia (59.6%) regions. Also, over the analyzed period, the employment rate of labor resources in the South-East Region showed the same positive trend registered at national level, increasing by 9.5 percent in 2015 compared to 2010.	The implementation of initiatives specific to the smart specialization process of the South-East region will, to a certain extent, influence the evolution of socio-demographic indicators regarding the occupancy rate of the labor force. Considering the contribution of the smart specialization process to the economic development of the South-East region, the employment rate of human resources in 2023 is predicted to be characterized by an increase of more than 25% compared to the value from 2015.
Number of researchers	At the level of the South-East region, the number of researchers in 2010-2015 increased from 1,302 researchers to 1,364. As for the number of R & D technicians and assimilated staff, a slight downward trend is observed in the Region between 2010 and 2014, with a slight increase in 2015 when 209 employees were registered. Interestingly, the number of other R & D employees in	The impact of implementing the regional innovation process may have a slightly positive effect on the indicator relative to the number of registered researchers at the regional level. This development is also supported by the slightly less noticeable increase in the number of researchers over the time frame analyzed. Thus, following the implementation of the initiatives proposed by the strategy, in the year 2023, the number of

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Analyzed indicators	Current situation	Foreseen development for 2023
	the South East Region tripled between 2010 and 2015, from 142 in 2010 to 450 in 2015.	researches registered in the South-East Region will increase by about 10% compared to the value registered in 2015.

The most relevant aspects regarding the future development of the South East Region are listed below:

- Issues related to the state of the economy at regional level: it is important that, in the future, special attention is paid to cooperation initiatives between the different categories of key stakeholders so as to provide the basis for ensuring the success of the South East Region's innovation strategy, from the economic perspective of the territory concerned. Special emphasis should also be placed on the visibility and promotion of existing initiatives and investment opportunities for the private environment in the region. In this respect, continuity of investment in competitive and innovative areas at regional level is welcomed, considering that support for potential investors in the region should be continuous and should use transparent mechanisms and instruments properly managed by decision-makers in the region.
- Aspects related to the socio-demographic situation of the region: as it can be seen from the socio-economic context analysis of the South-East Region, the research, development and innovation activities within the region do not have a significant share in the public or private environment, taking into account that these activities are addressed to a specialized and limited workforce in the region. However, the RDI field may have a considerable impact on the region, especially in terms of RDI related activities (RDI input, translating research results into prototypes, pilot projects, etc.), to support an integrated development that strengthens and emphasizes multidirectional cooperation between academia, the private environment, the public and civil society.

The vision of smart specialization strategy and its overall goal

The South-East Region capitalizes the economic and social opportunities specific to the territory and provides the optimal framework for the development of partner initiatives through the involvement of representatives of the quadruple helix (academia, the public environment, the private sector, civil society) so that, integrated actions of smart specialization in the specific fields

can be implemented at regional level, which are to determine on a medium and long term, a real growth of the region's competitiveness.

The general objective of the Smart Specialization Strategy of the South-East Region is to provide a favorable framework for key actors in the region which, by developing concrete action initiatives in the fields of smart specialization, will have a positive impact in relation to the sustainable development of the region.

In order to fulfill the vision of smart specialization in the South East Region and to ensure that its impact is disseminated at territorial level, a number of hypotheses that may affect and condition the achievement of the proposed objectives should be considered, such as:

- Increasing the motivation of the labor force involved in carrying out the research, development, innovation activities at regional level;
- Promoting the results of research activities and encouraging the implementation of the developed solutions, especially involving the academic environment and the private environment;
- Establishing sustainable operational partnerships in the fields of smart specialization through the involvement of the quadruple helix (academia, public environment, private environment, civil society);
- Encouraging public and private entities to support increased spending on research, development, innovation;
- Establishing and promoting tax incentives for private sector representatives conducting RDI activities.

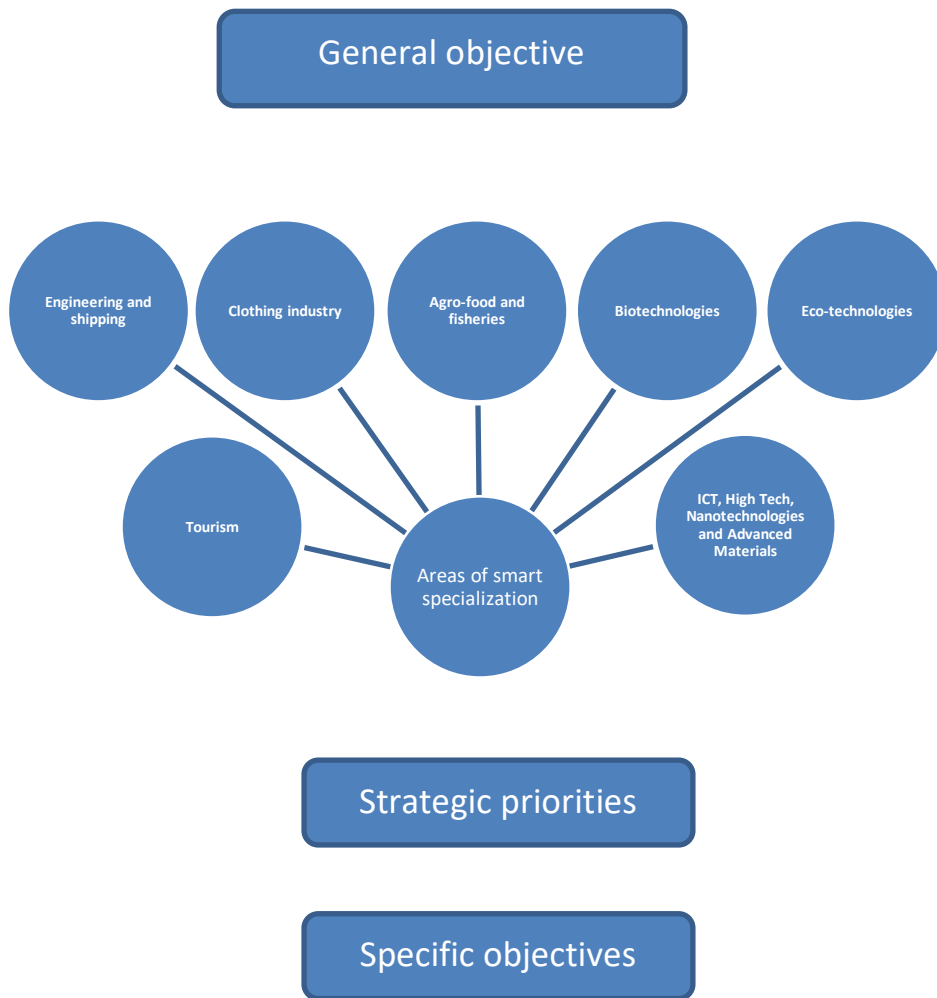
Chapter IV. Strategic priorities for smart specialization

The identification of priorities at the level of the South-East Development Region was carried out through a detailed analysis of the activities undertaken previously in the process of identifying the priority areas of smart specialization in the region. Thus, attention was focused on a limited number of R & D and innovation priorities, validated by previous entrepreneurial discovery. These priorities will be the areas where the region can actually excel. Priorities have been established with regard to the notion of innovation considered broadly, not only in terms of new products, but also in terms of new processes, new industries, social innovation, new business models and business practices.

The general objective of the Smart Specialization Strategy of the South-East Region is to provide a favorable framework for key actors in the region which, by developing concrete action initiatives in the fields of smart specialization, will have a positive impact in relation to the sustainable development of the region.

In the context of this general objective of the Strategy, a number of strategic priorities have been defined to support its implementation through concrete and achievable objectives. These were divided into cross-cutting priorities and priorities for smart areas.

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Cross-cutting (horizontal) priorities are the following:

1. Supporting the application of Key Enabling Technologies (KET) at the level of smart specialization domains;
2. Supporting the implementation of information and communication technology (ICT) at the level of smart specialization domains;
3. Support for the enterprises implementing research, development and innovation activities;
4. Supporting innovative clusters;
5. Development of human capital involved in RDI activities.

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Cross-cutting (horizontal) priorities	Areas of smart specialization mainly influenced by the implementation of this priority	Counties where significant added value would be generated
Supporting the application of Key Enabling Technologies (KET) at the level of smart specialization domains	Engineering and shipping; Biotechnology; Eco-technologies; ICT, High Tech, Nanotechnologies and Advanced Materials.	Brăila, Buzău, Galați, Vrancea, Tulcea, Constanța
Supporting the implementation of information and communication technology (ICT) at the level of smart specialization domains	Engineering and shipping; Agri-food and fishing industry; Biotechnology; Eco-technologies; ICT, High Tech, Nanotechnologies and Advanced Materials.	Brăila, Buzău, Galați, Vrancea, Tulcea, Constanța
Support for the enterprises implementing research, development and innovation activities	Engineering and shipping; Clothing industry; Agri-food and fishing industry; Biotechnology; Eco-technologies; Tourism; ICT, High Tech, Nanotechnologies and Advanced Materials.	Brăila, Buzău, Galați, Vrancea, Tulcea, Constanța
Supporting innovative clusters	Engineering and shipping; Clothing industry; Agri-food and fishing industry; Biotechnology; Eco-technologies; Tourism; ICT, High Tech, Nanotechnologies and Advanced Materials.	Brăila, Buzău, Galați, Vrancea, Tulcea, Constanța
Development of human capital involved in RDI activities	Engineering and shipping; Clothing industry; Agri-food and fishing industry;	Brăila, Buzău, Galați, Vrancea, Tulcea, Constanța

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Cross-cutting (horizontal) priorities	Areas of smart specialization mainly influenced by the implementation of this priority	Counties where significant added value would be generated
	Biotechnology; Eco-technologies; Tourism; ICT, High Tech, Nanotechnologies and Advanced Materials.	

Priorities for smart specialization areas (strategic priorities):

1. Reducing environmental pollution by using biotechnologies
2. Increasing the quality and quantity of food products through agro-food biotechnology
3. Supporting the adoption of SMART CITY solutions at the regional level
4. Innovative solutions in the shipbuilding and repairing field with minimal impact on the environment
5. Digitalization of ports and shipping transport and reducing the harmful environmental impact
6. Supporting the research, development and innovation to capitalize on alternative energy sources
7. Investments in eco-technologies to reduce the environmental pollution
8. Innovative solutions to promote the tourism
9. Supporting product and process innovation in the clothing industry

In order to ensure consistency between the general objective of the strategy and the smart specialization priorities defined, more specific objectives have been identified, applicable to all identified priorities:

Specific objectives

1. Increasing the share of expenditures with research, development and innovation activities in regional GDP;
2. Increase the number of public-private partnerships conducting RDI activities;
3. Increase the number of staff involved in RDI activities within RDI entities;
4. Creating mechanisms to facilitate the transfer of RDI results to potential users: economic agents, public institutions, NGOs, etc.

5. Increase the number of entities that apply essential generic technologies to the work done.

In the following paragraphs, the transversal priorities and those identified in the areas of smart specialization proposed within the Smart Specialization Strategy of the South-East Development Region will be described, and these will be translated into a series of specific measures.

Strategic Priority 1. Reducing environmental pollution by using biotechnologies

Biotechnologies ensure a rapid diversification and growth of food, energy, and pharmacologically active compounds through the biodegradation of organic waste, with a significant long-term impact on the quality of life and the protection of the environment. Thus, the main objective of biotechnologies is the development of biotechnological methods, means and products for increasing the quality and quantity of bioresources in the context of climate change and the growing demand for quality food. Biotechnologies have a positive impact on the environment, while also contributing to the economic growth of a region.

The development of biotechnologies will lead to fundamental changes in the agri-food sector, which are so necessary for environmental protection. Thus, genetic material manipulation technology anticipates a way to achieve richer crops by transferring nitrogen fixation genes to plants of major interest in terms of nutrition. Environmental biotechnology is a new way to evaluate and solve emerging environmental problems. Treating pollution as a result of inappropriate use of resources will entail finding optimal solutions for waste recycling and reuse, resulting in both pollution reduction and increased profits³³.

At regional level, support for biotechnology entities must materialize through a series of **measures**:

- Supporting the establishment of enterprises that have as their object research and development in biotechnology;
- Supporting investments to acquire the equipment and technologies needed to develop biotechnologies;
- Support for training activities of staff employed in organizations that develop and use biotechnologies;
- Facilitate partnerships with national or international entities active in the field of

³³ Dabu, C.M

biotechnologies where the RDI element is integrated, in order to ensure an exchange of experience and / or specialist staff;

- Support the implementation of transregional or transnational cooperation projects with other functional partner structures in the field of biotechnologies;
- Informing public and private research entities about the national and international funding sources available for developing and strengthening RDI activities in biotechnology.

Strategic Priority 2. Increasing the quality and quantity of food products through agro-food biotechnology

One of the challenges of Romanian agriculture is the adaptation to new technologies and the adoption of innovative practices, while the necessary funds can be obtained through the National Programme for Rural Development (NRDP) 2014-2020. The concept of the Partnership for Innovation in Agriculture is closely linked to the European Commission's Europe 2020 Strategy, the document underlining the role of research and innovation as key elements in the European Union's adaptation to the challenges of the future. Against this background, the South-East Region's agricultural development strategy should take into account the role of innovation as an indispensable element in the process of regional development and the achievement of competitive advantage.

The National Rural Development Program 2014-2020 contains a series of action measures aimed at innovative processes through the establishment and development of operational groups, the main purpose of which will be the development of pilot projects, new products, processes and technologies in the agricultural sector (sub-measure 16.1). Working groups will be created by local actors and will include farmers, researchers, consultants, businesses or NGOs to develop applied research projects to solve certain problems or exploit certain opportunities in the agri-food sector.

Improving the performance of the agricultural sector through innovative businesses will have positive effects on micro and macroeconomic stability, help to balance food consumption and agrifood security, increase the share of commercial agricultural holdings and generate jobs, including the absorption of surplus labor force in agriculture.

Support for smart specialization must be achieved through a set of instruments covering the whole spectrum of creative activities, from idea to market, and the enhancement of collaboration and partnerships between different actors. One of the areas of intelligent specialization for the strategic cycle 2014-2020, identified on the basis of scientific and commercial potential, is the

bioeconomy, an area benefiting from the huge potential of Romanian agriculture, in the context of a more active local food industry and growing standards, and global trends such as high demand for food. Smart specialization involves a complex effort to explore and select priority investment areas with economic and innovative potential.

Among the most important initiatives and **actions** that can be put into practice in better promoting innovation in the agri-food sector, can be mentioned:

- Establishing hydroponic farms (hydroponic farming can be considered a more modern branch of agriculture because it involves both the cultivation of vegetables and the growth of fish (aquaculture). Fish-derived nutrients feed plants for natural and rapid growth, while vegetables help cleaning of water. No fertilizer, pesticides or other chemicals required);
- Establishing clusters / operational groups in the agri-food sector at the level of the South-East Region;
- The use of industrial waste (paper) as a compost can be an innovative, future solution for soil fertilization and environmental protection in the rural communities of Europe.
- Creating safe, affordable and nutritionally optimized food products by capitalizing on existing and / or insufficiently exploited resources and their sustainable use, thus contributing to increasing the added value of the agri-food sector and jobs in rural areas, food quality and nutrition and, implicitly, to the health of the population;
- Renewing public confidence in food quality and safety by promoting the adoption of environmentally friendly and health-friendly solutions;
- Development of innovative value chains in the agri-food sector;
- Providing financial support to farmers, informing them and training them in order to promote innovation and knowledge transfer in the agri-food sector;
- Development of local, regional and national systems for conditioning, storage, processing and sustainable use of agro-food products;
- Development of regional and national refrigeration chains in order to increase the storage capacity of raw materials and food products;
- Improving research infrastructures in the agri-food sector and encouraging public-private partnerships.
- Purchase of equipment to reduce the impact of fishing on ecosystems;
- Acquisition of software and systems for monitoring production activity within aquaculture units;

- Acquisition of equipment and improvement of working and safety conditions for aquaculture workers;
- Purchase of modern equipment for processing fish and by-products, but also to improve the quality, safety and traceability of the products;
- Acquisition of software and monitoring systems for processing unit management;
- Increasing production capacity by re-introducing abandoned surfaces into the circuit;
- Development of logistics for specialized storage and transportation;
- Increase in the number of first sale centers for fish;
- Promotion and implementation of organic aquaculture.

Strategic Priority 3. Supporting the adoption of SMART CITY solutions at the regional level

SMART cities mean cities that are more enjoyable, inclusive and where technology is not a luxury but simplifies the existence of locals and local government. Smart and Technologized means more educated, healthier, less expensive, more involved in everything the public administration process means, more opportunities for business and citizens, benefits that translate into an improvement of the quality of life - an easier interaction, friendly people with the city, with the environment, with the peers and oriented towards a future supported by integrated smart technologies. The concept goes beyond the relationship between citizens and public service providers and provides the tools that encourage citizens to be more active and to participate more in the community life. For example, to provide feedback on road conditions, adopt a healthier lifestyle, or participate as volunteers in various social activities. In this way, the Smart City will be a more attractive place to live, work and recreate.

At the level of the South-East Development Region, the city of Constanta will benefit from SMART solutions consisting of intelligent parking and street lighting solutions based on LED technology, a pillar with multiple components, including a charging socket electric vehicles and sensors for environmental monitoring, as well as free wi-fi internet. Besides, the fact that there is also a software park in Galati creates the premises for the development of partnerships in order to identify, develop and implement the best SMART solutions in the region.

At regional level, support for entities active in the development and implementation of SMART CITY solutions must materialize through a series of **measures**:

- Supporting investments to purchase the hardware and software tools needed to conduct RDI activities in the field of SMART CITY solutions;
- Support for staff training activities in order to develop the skills needed in the SMART CITY adoption process;
- Facilitate partnerships with national or international entities active in the development and implementation of SMART CITY solutions;
- Supporting IT clusters for the development of SMART CITY solutions at regional level;
- Supporting the implementation of transregional or transnational cooperation projects with other functional partnership structures for the implementation of SMART CITY solutions.

Strategic Priority 4. Innovative solutions in the shipbuilding and repairing field with minimal impact on the environment

The South-East Development Region has a particular development potential through the shipbuilding industry. In this area, the shipbuilding and repairing activity of ships where numerous investments of major importance have been made in the last years. In the region one can find the most important shipyards from Romania in Constanta, Midia, Mangalia, Braila, Galati and Tulcea. The long tradition of naval construction has led to the development of educational programs offering highly qualified specialists, sustained research and qualified design. Romanian shipyards are generally specialized in the construction of ships for freight. The main types of ships built here are bulk carriers, cargo tanks, cargo ships, fishing vessels, sea trailers, pushers and barges. The professionalism of Romanian shipbuilders is recognized internationally, Romania being the preferred destination for the production of technical and commercial ships in Europe. At the same time, the related industry has, in recent years, seen a spectacular dynamics that supports the performance of shipyards. All these arguments demonstrate the need for smart specialization of the South East Development Region in the shipbuilding industry and the importance of prioritizing the construction subsection and ship repair.

The main **measures** by which shipbuilding and ship repair can be sustained for a smart specialization of the region are:

- Supporting investments for procurement of equipment, hardware and software tools needed for research and development and innovation in shipbuilding and ship repair;
- Facilitating the participation of innovative companies and R & D organizations in the region

carrying out shipbuilding and ship repair activities in various international partnerships;

- Supporting training activities of the staff involved in RDI activities that have as final objective the development of the field of shipbuilding and ship repair;
- Informing RDI entities regarding national and international funding sources in shipbuilding and ship repair;
- Supporting public-private partnerships for research and development and innovation in the field of shipbuilding and ship repair.

Strategic Priority 5. Digitalization of ports and shipping transport and reducing the harmful environmental impact

Harbours and shipping are essential for European transport affairs, for Europe's competitiveness, with huge potential for job creation and investment attraction. Europe's harbours are transit points to the European continent. 74% of non-EU goods are transported via harbours. They are equally important for intra-European trade. Each year, 37% of intra-EU goods traffic and 385 million passengers pass through harbours.

More than 1200 commercial sea harbours operate around 70,000 kilometers off the coast of the Union. Europe is one of the world's densest maritime regions. The EU harbour industry has a significant economic impact on employment and on the activity in the harbour industry itself (direct impacts), downstream of the distribution chain (indirect impacts) and across the EU economy (induced impacts)³⁴.

Digitalization of harbours is a priority of the region because, according to the European Commission, Europe's harbours face 3 major challenges:

- By 2030 there is a 50% increase in goods handled in EU harbours. This growth is an opportunity for growth and more jobs: the Commission estimated that between 110,000 and 165,000 new jobs could be created in harbours by 2030. However, Europe's harbours need to adapt to face an increase in traffic.
- The nature of business activity is changing.
- There are very significant performance gaps between Europe's harbours. At present, three of the best European harbours, Antwerp, Hamburg and Rotterdam represent one fifth of all

³⁴ European Commission, 2013

goods arriving in Europe at sea. The performance gap produces enormous inefficiencies - longer distances, diversions of traffic, longer trips at sea and land, and eventually more transport and more agglomerations to the detriment of EU citizens and the economy. Unless action is taken, this will worsen as traffic increases.

In the context of the accelerated growth of goods handled in harbours, the direction of digitization of shipping is absolutely necessary. All the more so since competitiveness, decarbonisation and digitization are the guiding principles underpinning EU maritime transport policy by 2020 and beyond. These principles seek to ensure that maritime transport remains an attractive way to transport goods and people, making it even more environmentally friendly. It should also be a catalyst for investment and innovation.

The main **measures**, by which digitization of harbours and shipping and the reduction of the harmful impact on the environment for a smart specialization of the region can be achieved, are:

- Supporting investment for the procurement of hardware and software tools needed to digitize harbours and shipping;
- Facilitating the participation of RDI entities in the region engaged in the digitization of shipping in various national and international partnerships;
- Supporting the training of staff involved in RDI activities aiming at digitization of harbours and shipping.
- Informing RDIs on national and international funding sources for harbours and shipping digitization;
- Supporting public-private partnerships for RDI in the field of digitization of harbours and naval transport.

Strategic Priority 6. Supporting the research, development and innovation to capitalize on alternative energy sources

Renewable energy sources (wind energy, solar energy, hydropower, ocean energy, geothermal energy, biomass and biofuels) are alternatives to fossil fuels that help reduce greenhouse gas emissions, diversify energy supply and reduce dependence volatile and unreliable markets for fossil fuels, especially oil and gas. European Union legislation on the promotion of renewable sources has evolved significantly in recent years. At present, there are many energy sources that are renewable and environmentally friendly. In Romania, solar energy is used to produce

heat for the preparation of hot water during the hot period. There are already solar houses in several locations.

In the South-East Development Region, Dobrogea became the largest wind farm in Central and Eastern Europe, with Constanta County being hauled with hundreds of turbines with a power of 2.5MW in areas such as Cogealac, Fântânele, Cave, Independence, Chirnogeni, Siliștea, Târgușor, The Cross. One of the largest functional wind farms in Constanta County is in the Cogealac-Fântânele area with 240 turbines and a total installed capacity of 600 MW, while a reactor of the Cernavoda Nuclear Power Station has an electric power of about 700 MW.

Thus, innovation is promoted to capitalize on alternative energy sources for the adoption and implementation of concrete **actions**, such as:

- Increasing investment in demonstration projects and stimulating the demand for innovative technologies;
- Development of energy-crop agricultural crops to obtain products such as biofuels (biodiesel, ecological diesel) and electric or thermal energy;
- Carrying out experimental research on the use of marine energy produced by the Black Sea (wave energy);
- Carrying out investments in the transport infrastructure of energy produced from renewable sources;
- Developing support schemes for the use of renewable energy for electricity and heat;
- Supporting research, development, innovation in the energy sector, focusing on increasing the energy and environmental efficiency.

Strategic Priority 7. Investments in eco-technologies to reduce the environmental pollution

Transforming our economies from linear economies into circular economies offers the opportunity to reinvent them and make them more sustainable and competitive. This will stimulate investment and bring benefits both in the short and long term for the economy, the environment and citizens alike. In Romania, the efficient use of resources is low and the circular economy remains poorly developed. Along with Bulgaria and Estonia, "resource productivity" (the economy's efficiency in using material resources to produce wealth) was the lowest in the EU in 2015, standing at 0.31 EUR / kg compared to the EU average of 2, 0 EUR / kg. Not so much the lack of resources as the lack of efficient management of the available resources is what poses problems for the sustainable

development in Romania. Romania is lagging behind in adopting the relevant planning tools for waste management. Its waste disposal rate is highest in the EU (82% in 2013). This indicates that resources are not kept in the economy when a product has reached its end of life. A more circular economy, ie focused on recycling and re-use, as well as more efficient use of resources, would help to stimulate investment. It would also generate short- and long-term benefits for the environment, employment and the economy as a whole.

Environmental protection includes several **activities** aimed at better maintenance or restoration of a clean environment by collecting, recycling and treating waste, preventing emissions of pollutants, noise or reducing the presence of pollutants in the environment.

- Construction / rehabilitation / modernization / extension of the water and wastewater infrastructure;
- Construction / rehabilitation / modernization of treatment plants;
- Applying ecological solutions for wastewater collection and treatment, including in the case of the Danube Delta and the Black Sea;
- Using collected solid waste, including composting, as well as sludge from sewage treatment plants;
- Development of risk maps;
- Elaborating a regional action plan in the case of accidental pollution of the Danube River;
- Updating management plans for protected areas;
- Use of pollution prevention technology (video monitoring of high risk areas);
- Making investments in environmental quality monitoring systems;
- Organizing competitions / project ideas ideas in ecoinnovation.

Strategic Priority 8. Innovative solutions to promote the tourism

The European Regional Development Fund (ERDF) supports the competitiveness, sustainability and quality of tourism at regional and local level. Tourism is undoubtedly closely linked to the use and development of natural, historical and cultural capital and to the attractiveness of cities and regions as living, working and leisure activities. At the same time, it is also closely related to the development, innovation and diversification of visitors' products and services.

Tourism has not been included as a thematic objective in the European Structural and Investment

Funds regulations as it is more a means or a sector rather than an objective. However, the regulations provide many opportunities for smart investment in tourism.

Tourism will continue to occupy an important place at the level of ERDF planned investments and related investments for the conservation, protection, promotion and development of natural and cultural heritage, with an allocation from the ERDF of around EUR 8 billion.

In the new emerging landscape of smart regional specializations in Europe under the smart specialization platform, many regions give priority to their own smart specialization strategies for the innovation of tourism services and business models, and will allocate substantial funds to achieve this goal. They will focus their efforts, for example, on the development of competitive niche markets and brands, including tourism for the elderly ("third-age economy") or eco-tourism, by improving their value chains in the tourism sector, by targeting some more advanced market segments and diversifying tourism to reduce their dependence on seasonal tourism.

These regions have comprehensive strategies to achieve a higher added value not only by investing in tourism innovation but also by stimulating more significant repercussions on other sectors such as the cultural and creative industries, the agri-food sector, construction etc.

In this context, it is considered that for the development of tourism at the level of the South-East Development Region, by developing innovative solutions, a series of specific **measures** should be implemented, such as:

- Creation and development of a regional tourism brand;
- Development of cruise tourism;
- Development and promotion of value-added tourism products (ecological tourism, gastronomic tourism, balneary tourism, conferences and congresses tourism, cultural tourism, archaeological tourism, etc.);
- Promotion of thematic tourism, such as beekeeping tourism in the Caraorman area, hiking in the Letea Forest;
- Promoting eco-tourism in protected areas such as Letea, Matita-Merhei, Fortuna;
- Local valorisation of traditions, handicrafts workshops, promotion of lesser-known areas and specific activities;
- Development of programs for the valorization and preservation of villages with a natural, architectural, monumental or agrarian-ecological character;
- Rehabilitation and modernization of the slopes of localities located on the banks of the

Danube: Brăila, Galati, Tulcea, Mahmudia, Sulina for the access of leisure boats, cruises and yachting;

- The development of new innovative routes (among the most well-known innovative routes that have been developed in the South-East Development Region, can be mentioned: Bicycle Vineyard Road (Vrancea), Canal by Delta: Innovative Methods of Nature Interpretation (Tulcea)
- Promoting innovation and diversifying products, processes and services, as well as their specialization for niche markets, to overcome temporary dependence on low value added and to ensure economic activity and off-season jobs;
- Informing small entrepreneurs about the opportunity to access funding sources to promote innovation in tourism;
- Strengthening guarantee and counter-guarantee instruments to stimulate investment in tourism (including rural lending);
- Implementation of innovative technical solutions for the simplification of tourist activities on the one hand and on the other hand for the increase of tourist's security (mapping of tourist routes with GPS);
- Development of e-tourism in order to ensure the best possible promotion of the existing tourism potential in the South-East Region, especially for attracting foreign tourists;
- Development of tourism for fishing, by creating / improving the specific infrastructure for recreation and accommodation;
- Developing workshops for making fishing gear, building boats and capitalizing on new fishery resources;
- Creation of accommodation units (camping or boarding houses), public catering establishments specialized in serving fish products (pontoon restaurant, cherhana), recreational areas specialized on fishing activities;
- Building a network of locations for the promotion and valorisation of local identity (museum-fishing village, information point, exhibition center, specialized guide, etc.).

Strategic Priority 9. Supporting product and process innovation in the clothing industry

In a knowledge-based economy, the future of the clothing industry will increasingly depend on the industry's ability to assimilate innovation in order to streamline production processes, organizational

structures and commercial operations in close correlation with the changing needs of customers.

The studies and analyzes carried out at the level of the textile industry show that the South-East Development Region has a very high development potential in the clothing sector. Regarding the actual **measures** to promote and use innovation in clothing, we can mention:

- Using advanced IT solutions in the production process;
- Introducing the use of digital-fashioning, or the possibility of the customer to personalize the product in the virtual environment, and to deliver the product as soon as possible;
- Use of innovative materials, biomaterials and functional textiles for medical use;
- Creating and promoting local brands (eg SIMIZ Fashion, Focșani);
- Obtaining multifunctional products, using nanotechnologies and microelectronics, which form a value chain using advanced materials with multi-sectoral applications, eg products with dirt removal properties, respirable Lotus-effect nanostructures;
- Creating technological incubators in the clothing and textile sectors by capitalizing on non-reimbursable financing opportunities;
- Development of dual education through the implementation of partnerships between private companies and specialized vocational schools in the South-East Region;
- Financing research-development-innovation projects in the textile and clothing sector for creating and testing experimental products included in the "smart textiles" category (light shirts, energetic clothing, sweater that checks the health of the individual, etc.).

Horizontal priority 1. Supporting the application of Key Enabling Technologies (KET) at the level of smart specialization domains

As defined by the European Commission, the essential generic technologies or Key Enabling Technologies - KET refers to micro/nanoelectronics, photonics, nanotechnology, industrial biotechnology, advanced materials and advanced manufacturing technologies. Being a trend in the developed world economies, KETs are constantly associated with a highly intensive RDI process with fast innovation cycles, high capital expenditures, and highly qualified labor³⁵.

From the perspective of Horizon 2020 Programme, the industrial and economic competitiveness can only be ensured through essential generic technologies. With applications across multiple industries,

³⁵ Guide to Research and Innovation Strategies for Smart Specialisation (RIS3), 2012

KET can bring regional innovation and support the economic growth. At the level of the entire European Union, countries are confronted with the difficulty of translating knowledge into concrete products and services. Production based on KET is declining, with European patents being extensively exploited outside Europe.

At regional level, the support offered to the entities that implement RDI activities for the development and application of key enabling technologies can represent a set of specific measures, with some examples being given below:

- Support for investments in the procurement of equipment, hardware and software tools necessary for KET research, development and innovation;
- Facilitating the participation of innovative companies and R&D organizations in the region in European initiatives and setting up pilot lines in European consortia with the effect of expanding the supply of technological services, scientific expertise and access to modern equipment;
- Support for the training activities of the staff involved in RDI activities in order to develop skills necessary for the application of essential generic technologies;
- Informing the entities that implement RDI activities on national and international funding sources that can be used to develop and implement KETs;
- Promotion of tax benefits and facilities for enterprises engaged in KET activities.

Horizontal priority 2. Supporting the implementation of information and communication technology (ICT) at the level of smart specialization domains

Currently the human resources and the information are the most important assets of an organization. It is impossible to develop an organization and implicitly a region or country without the use of information and communication technology. In this context, the smart specialization of a region is dependent on ICT, regardless of the field of smart specialization identified.

The Romanian ICT industry produces computing, data and telecommunication equipment, software and services with a positive growth rate. In the software sector, the development is remarkable, and the number of specialists is steadily increasing. At the level of the South-East Development Region there are numerous university centers that prepare ICT specialists, but there is also the software park in Galați and various other organizations that can offer jobs. This high-skilled ICT

workforce can contribute to the economic development of the region and to the implementation of ICT in all the identified areas of smart specialization.

The main measures through which the implementation of information and communication technology (ICT) can be supported at the level of smart specialization domains are:

- Supporting investments for procurement of hardware and software tools necessary for the technology computerization and transfer;
- Facilitating the participation of research, development and innovation entities that implement Ict activities in the region in various national and international partnerships;
- Support for the training activities for the personnel involved in RDI activities that have the ultimate goal of computerization;
- Informing the RDI entities on national and international funding sources in the ICT field;
- Support to create and ensure the functioning of integrated electronic platforms at the regional level to ensure the dissemination of RDI activities results and to allow the posting of announcements to identify potential partners for RDI project submission.

Horizontal Priority 3. Support for the enterprises implementing research, development and innovation activities

This priority seeks, first of all, to facilitate the access to financial instruments for enterprises in order to support investment in research, development and innovation, in particular the private ones. Often, the SMEs face difficulties in obtaining loans or in attracting private capital due to the risk they present, due to the low reimbursement capacity as a result of worsening the economic and financial situation, due to the reluctance of financial institutions and due to the limited guarantees they can offer. In addition to the difficult access to finance, the SMEs still face difficulties in gaining access to new technological developments, to knowledge and technology transfer, or to staff with advanced skills (technological risk).

The financing of some innovative technological projects that aim to achieve product or process innovation will contribute to the financial stability of businesses that want to be performing on the market through the production and marketing of new or substantially improved products.

Supporting the innovative enterprises should be linked to the development priorities identified in the South-East Region so that investment in R&D and innovation generates economic growth,

primarily at local level.

The support offered for the innovative enterprises can come in various forms, for example taking a series of **specific measures**, some of which are presented below:

- Supporting the investments in the procurement of equipment, hardware and software tools necessary for innovation and / or research / development;
- Supporting the acquisition of patents by small and medium-sized enterprises in the South-East Region;
- Supporting the training activities of the staff employed to develop the necessary skills in the innovation process;
- Support for marketing activities to identify supply and access to existing demand for the planned innovative product or market niches that can be accessed through innovation in the production process;
- Informing the business community about the national and international funding sources usable for implementing innovative ideas;
- Promoting the tax advantages and facilities for the companies implementing RDI activities;
- Facilitating partnerships with national or international entities activating in similar areas of activity where the RDI element is integrated, in order to provide an exchange of experience and/or specialized staff;
- Developing innovation advisory services in the form of integrated service packages (consultancy, assistance and training services in terms of knowledge transfer, acquisition, protection and use of intangible assets, use of standards and regulations that contain them).

Horizontal Priority 4. Supporting the innovative clusters

From the perspective of many economic and business experts, based also on the experience of other European economies, the clusters can boost the economic development and bring an added value.

There are currently 12 clusters in the South-East region that are specialized in various fields such as tourism, transport, shipbuilding, clothing, sustainable development, bio-economy, IT, alternative energy, health. In line with the areas of smart specialization identified, it is important to strengthen the existing partner networks by increasing the number of co-operative projects implemented and by strengthening the management and communication capacity at the functional

clusters. It should also be mentioned that other new clusters can be developed at the level of the South-East Region in areas such as: food industry, viticulture and petrochemical industry.

Supporting the activity of innovative clusters and other economic cooperation structures must be based on a diversified, modern infrastructure and endowed at European standards both at regional and local level. It is necessary to expand and support the activity of innovative clusters and other structures and networks of cooperation as well as economic promotion activities in the South-East Region. It is also desirable to promote as efficiently as possible the innovative clusters and other cooperation structures and networks as catalysts for the economic development and smart specialization in the region. In addition, in the context of the smartt specialization of the South-East Region, the development or creation of new niches is essential, and this can be achieved through an inter- and cross-sectoral approach.

In order to support the activities of the functional clusters and to develop the activities of the emerging clusters, a series of **specific measures** can be implemented, such as:

- Promoting the activity of innovative clusters to expand the partner network with new members;
- Supporting the use of specific management tools to increase the involvement of members in the implementation of technological transfer and know-how actions;
- Supporting the clusters to develop new services and facilities for the active members;
- Supporting the implementation of transregional or transnational cooperation projects with other functional partner structures;
- Developing partnerships and cooperation platforms between the research and the economic environment through access to infrastructure at European standards;
- Developing cooperation with scientific and technological parks; incubators; design centers, etc. to promote entrepreneurship in emerging industries.

Horizontal Priority 5. Development of human capital involved in RDI activities

The smart growth, with a strong focus on education and the development and valorisation of research, development and innovation, is a vector of convergence in increasing competitiveness and quality of life in all the development regions. In this sense, the human resources in this area have the greatest contribution, while supporting the improvement, diversification and valorisation of

their competences, becomes a priority not only at national level but also at regional level.

The specific objective of this priority is to increase the number of researchers and the staff assimilated at the level of the research institutes and the economic agents implementing the RDI activities.

In order to stimulate the human resources active in the field of RDI, a series of **specific measures** can be implemented, such as:

- Attracting talented young people towards the research career by organizing competitions with prizes for the innovative solutions;
- Supporting the organization of specialization courses to extend the knowledge base for the researchers and the assimilated staff;
- Supporting temporary staff exchanges between the public and private research entities;
- Support offer to coopt specialists (researchers with international recognition) in order to co-ordinate the research teams;
- Support for the implementation of an integrated regional system for the award and recognition of notable RDI results obtained by the researchers and assimilated staff;
- Stimulating the interest of highschool and university students in the RDI sector through study visits, internships and involving them in research activities and projects within the entities implementing activities in the field;
- Supporting the scientific training of the staff implementing research activities;
- Creating university jobs to attract renowned researchers or academics;
- Encouraging the attraction of advanced foreign researchers to lead projects in a host institution in the South East Region;
- Integrating the PhD students and young PhDs into RDI projects;
- Conducting thematic research, at the researchers' initiative, supported by the public institutions directly interested by these results.

Chapter V. Definition of policy mix and the action plan

The elaboration of the Action Plan for the South-East Development Region has the role of establishing concrete tools and ways to support the achievement of the specific objectives set in the Smart Specialization Strategy of the South-East Development Region. We reiterate below the specific objectives of the strategy, as defined in Chapter 4, as:

1. Increasing the share of expenditures for research, development and innovation activity in the regional GDP;
2. Increasing the number of public-private partnerships implementing RDI activities;
3. Increasing the number of staff involved in RDI activities at the level of RDI entities;
4. Creating mechanisms to facilitate the transfer of RDI results to potential users: economic agents, public institutions, NGOs, etc.
5. Increasing the number of entities that apply Key Enabling Technologies within the implemented activities.

The Action Plan of the South-East Development Region in the context of smart specialization consists of a set of pilot projects proposals in the field of research, development, innovation, transmitted by the key actors in the region that activate in the field of RDI and which can contribute to the efficient implementation of the smart specialization strategy. The proposals for smart specialization pilot projects are directly linked to the strategic priorities for smart specialization established at the regional level. The proposed project portfolio emphasizes the role of the key actors in the region within the entrepreneurial development process and it is an instrument through which the strategy can be effectively implemented and orientated towards achieving the proposed objectives and results. In addition to this role, the Action Plan of the South-East Development Region aims to identify the potential sources of funding and the eligible beneficiaries.

The Strategy Action Plan proposes to target the efforts of the key players in the South-East Development Region to achieve common objectives and to act in a coordinated and coherent manner to reach the results and to create synergies in the identified fields of smart specialization.

5.1. Key lines of action corresponding to the identified priorities

As a result of the exhaustive analysis carried out for the elaboration of the Smart Specialization Strategy of the South-East Development Region, a set of priorities (9 strategic priorities corresponding to the fields of smart specialization and 5 horizontal priorities) were identified and proposed and then there were established its specific objectives, that were later transposed into concrete measures and specific lines of action for the regional development.

The key action lines outlined below are the most relevant measures from the proposed set for each strategic priority, which have a high degree of maturity and can be immediately transposed into project ideas or concrete implementation actions.

The Smart Specialization Strategy for South-East Region

Strategic priority		Key action lines (Priority measures)	Specific objectives
Strategic Priority 1. Reducing pollution by using biotechnologies	Priority 1. environmental by using	<ul style="list-style-type: none"> Supporting the creation of enterprises that have as object the research and development activities in biotechnology; Supporting the training activities of the staff employed in organizations that develop and use biotechnologies; Facilitate the partnerships with national or international entities active in the field of biotechnologies where the RDI element is integrated, in order to ensure an exchange of experience and / or specialized staff; 	1. Increasing the share of expenditures for reserach, development and innovation activity in the regional GDP; 2. Increasing the number of public-private partnerships implementing RDI activities; 3. Increasing the number of staff involved in RDI activities at the level of RDI entities; 4. Creating mechanisms to facilitate the transfer of RDI results to potential users: economic
		<ul style="list-style-type: none"> Establishing clusters / operational groups in the agri-food sector at the level of the South-East Region; Improving research infrastructures in the agri-food sector and encouraging public-private partnerships. 	
		<ul style="list-style-type: none"> Supporting investments to purchase the hardware and software tools needed to implement RDI activities in the field of SMART CITY solutions; Support for the professional training activities in order to develop the skills needed in the SMART CITY adoption process; Supporting IT clusters for the development of SMART CITY solutions at the regional level; 	
		<ul style="list-style-type: none"> Supporting the investments for procurement of equipment, hardware and software tools needed for the research, development and innovation in shipbuilding and repair field; Support for public-private partnerships for research, development and innovation in shipbuilding and ship repair field. 	

The Smart Specialization Strategy for the South-East Development Region

Strategic priority	Key action lines (Priority measures)	Specific objectives
Strategic Priority 5. Digitalization of ports and shipping transport and reducing the harmful environmental impact	<ul style="list-style-type: none"> • Support for investment in procurement of hardware and software tools needed to digitalize the ports and shipping transport; • Facilitate the participation of R&D and innovation entities in the region that are engaged in digitization of shipping in various national and international partnerships; • Support for the development of public-private partnerships for research and development in the field of digitization of ports and shipping. 	<p>agents, public institutions, NGOs, etc.</p> <p>5. Increasing the number of entities that apply Key Enabling Technologies within the implemented activities.</p>
Strategic Priority 6. Supporting the research, development and innovation to capitalize on alternative energy sources	<ul style="list-style-type: none"> • Development of energy agricultural crops - crops addressed to obtain products such as biofuels (biodiesel, ecological diesel) and electric or thermal energy; • Realization of experimental research on the use of marine energy produced by the Black Sea (wave energy); • Realization of investments in the transport infrastructure of energy produced from renewable sources; 	
Strategic Priority 7. Investments in eco-technologies to reduce the environmental pollution	<ul style="list-style-type: none"> • Use of pollution prevention technology (video monitoring of high risk areas); • Realization of investments in the environmental quality monitoring systems; • Organizing competitions / project ideas in ecoinnovation. 	
Strategic Priority 8. Innovative solutions to promote the tourism	<ul style="list-style-type: none"> • Promoting the ecological tourism in the protected areas; • Developing new innovative routes; • Implementation of innovative technical solutions for the simplification of tourist activities on the one hand and on the other hand for the increase of tourist's security (mapping of tourist routes with GPS); • Development of e-tourism in order to ensure the best possible promotion of the existing tourism potential in the South-East Regions, especially for attracting foreign tourists. 	
Strategic Priority 9. Supporting product and process innovation in the	<ul style="list-style-type: none"> • Using advanced IT solutions in the production process; • Creating technological incubators in the clothing and textiles sector by capitalizing on non-reimbursable financing opportunities; 	

The Smart Specialization Strategy for the South-East Development Region

Strategic priority	Key action lines (Priority measures)	Specific objectives
clothing industry	<ul style="list-style-type: none"> Financing research and development-innovation projects in the field of textiles and clothing for the creation and testing of experimental products, from the category of "smart textiles" (light shirts, energetic clothing, powders that check the health of the individual, etc.). 	
Horizontal priority 1. Supporting the application of Key Enabling Technologies (KET) at the level of smart specialization domains	<ul style="list-style-type: none"> Support for investments in the procurement of equipment, hardware and software tools necessary for KET research, development and innovation; Support for the training activities of the staff involved in RDI activities in order to develop skills necessary for the application of essential generic technologies. 	
Horizontal priority 2. Supporting the implementation of information and communication technology (ICT) at the level of smart specialization domains	<ul style="list-style-type: none"> Supporting investments for procurement of hardware and software tools necessary for the technology computerization and transfer; Support to create and ensure the functioning of integrated electronic platforms at the regional level to ensure the dissemination of RDI activities results and to allow the posting of announcements to identify potential partners for RDI project submission. 	
Horizontal Priority 3. Support for the enterprises implementing research, development and innovation activities	<ul style="list-style-type: none"> Supporting the acquisition of patents by small and medium-sized enterprises in the South-East Region; Supporting the training activities of the staff employed to develop the necessary skills in the innovation process; Developing innovation advisory services in the form of integrated service packages (consultancy, assistance and training services in terms of knowledge transfer, acquisition, protection and use of intangible assets, use of standards and regulations that contain them). 	
Horizontal Priority 4. Supporting the innovative clusters	<ul style="list-style-type: none"> Promoting the activity of innovative clusters to expand the partner network with new members; Supporting the use of specific management tools to increase the involvement of members in the implementation of technological 	

The Smart Specialization Strategy for the South-East Development Region

Strategic priority	Key action lines (Priority measures)	Specific objectives
	transfer and know-how actions; <ul style="list-style-type: none"> • Developing cooperation with scientific and technological parks; incubators; design centers, etc. to promote entrepreneurship in emerging industries. 	
Horizontal Priority 5. Development of human capital involved in RDI activities	<ul style="list-style-type: none"> • Attracting talented young people towards the research career by organizing competitions with prizes for the innovative solutions; • Supporting temporary staff exchanges between the public and private research entities; • Support for the implementation of an integrated regional system for the award and recognition of notable RDI results obtained by the researchers and assimilated staff; • Integrating the doctoral students and young PhDs into RDI projects. 	

5.2. Target groups, actors involved and their responsibilities

The target groups defined for implementing the strategic priorities established in the current strategy are:

- Entrepreneurs, SMEs, Spin-offs and Start-ups;
- Big companies in the region;
- Business networks and clusters established at regional level;
- Organizations that are members of business networks and clusters established at regional level;
- Professors in the regional education system;
- Highschool students, students and master students in the regional education system.

The implementation of the Smart Specialization Strategy of the South-East Development Region will be realized through a partner structure that will be defined and established by the South East Regional Development Agency, named the Regional Innovation Consortium (RIC).

The RIC will be responsible for coordinating the governance process of the Smart Specialization Strategy of the South East Development Region (SSIR / RIS3), in accordance with the provisions of the Methodology for the elaboration of the Framework Document for the Regional Smart Specialization Research and Innovation Strategy developed by the Ministry of Regional Development, Public Administration and European Funds. Also, the Regional Innovation Consortium of the South-East Development Region (RIC South-East) is a consultative structure, without legal personality, whose role will be both in endorsing the Regional Framework Document elaborated for programming the financing from the Regional Operational Program (ROP) 2014-2020, Axis 1 - Promotion of Technological Transfer, realization of South-East RIS3 Project Portfolio, and the monitoring of RIS3 Strategy.

The Regional Innovation Consortium will be composed of representatives of the following categories of institutions / entities / organizations:

- Research / education;
- Entrepreneurship;
- Public Authorities;
- Civil society.

The structure of the Regional Innovation Consortium is proposed in Annex 2 of this Strategy.

Smart Specialization Strategy of South-East Development Region

The Regional Innovation Consortium has the following tasks, according to the provisions of the Methodology for the elaboration of the Framework Document for the Regional Smart Specialization Research and Innovation Strategy:

- participate and provide points of views, suggestions and observations in the consultation process on the elaboration and updating of South-East RIS3;
- approves the Regional Framework Document elaborated for the programming of the financing under Axis 1, ROP 2014-2020;
- analyzes the portfolio of priority projects of South-East RIS3;
- monitors the South-East RIS3 strategy;
- contributes to identifying the sources of information needed to monitor the South-East RIS3;
- provide information on the projects implemented in the South-East Region in accordance with the RIS3 priorities;
- proposes possible structural and legislative changes necessary for the implementation of RIS3 South-East;
- informs the management of the institution it represents about the tasks and activities carried out within the RIC and ensures that its position in relation to the decisions, documents discussed or elaborated within the RIC, is consistent with the official point of view of the institution / organization it represents within the RIC;
- disseminates to other institutions and organizations with which they are in the institutional relations the relevant information regarding the activity of the Regional Consortium, priorities and measures of the South-East RIS3;
- proposes to complement this Regulation with other tasks and responsibilities.

5.3. Proposed timeframe and indicators

The proposed timeframe for implementing the Smart Specialization Strategy of the South-East Development Region is 6 years covering the period 2018-2023. This period allows the correlation of the indicators established in the strategy with the Program indicators monitored by the South-East RDA within the 2014-2020 ROP and the 2014-2020 COP, their values being reported in 2023.

It is also to be mentioned that the proposed interval allows the measures to be implemented simultaneously, no relationship of interdependence is foreseen between them or any priority order.

The indicators for monitoring the Smart Specialization Strategy of the South-East Development Region are presented in Chapter 6 of this Strategy.

5.4. Delivery mechanisms and projects

The implementation of the Smart Specialization Strategy of the South-East Development Region is conditioned by the implementation of the established priorities and measures, transposed in project ideas that are applicable and achievable at regional level, involving key actors in the field of research, development and innovation.

Thus, a portfolio of projects containing the most relevant RDI projects (Annex 1 to this strategy) was realized, following the survey applied among the regional stakeholders, representatives of the quadruple helix (public authorities, education / research, civil society, entrepreneurship).

Moreover, the project portfolio can be complemented by the ideas already expressed by the regional actors through the letters of intent submitted for funding under Priority Axis 1: Promoting Technological Transfer (Regional Operational Program 2014-2020).

5.5. Financing sources

Focusing on R&D activity represents a trend and a priority for the European countries, which have led in recent years to allocating funds dedicated exclusively to R&D, innovation and smart specialization activities. Thus, on 30th of November 2011, the European Commission presented a package of measures to boost innovation and competitiveness research in Europe, launching the Horizon 2020 Programme for investment in research and innovation with a budget of over € 80 billion. This program brings together all EU research and innovation funding and focuses on turning scientific discoveries into innovative products and services that offer business opportunities and seek to improve people's lives.

However, the activity of R&D in Romania is still at an early stage of funding, also taking into account the fact that in the last 20 years there has been insufficient funds allocated for RDI activity. The situation has seen a number of improvements in recent years, especially since the first funding scheme for research projects was launched, namely the National Plan for Research, Development and Innovation (1997), which introduced RDI terminology (research, development and innovation). The National Plan for Research, Development and Innovation for the period 2007-2013 (NP II) was the main instrument by which the National Authority for Scientific Research (NASR) implemented the National Strategy for Research, Development and Innovation. This plan is continued with the National R&D and Innovation Plan for the period 2015-2020 (NPRDI III). NPRDI III focuses on a series of principles concerning the annual provision of RDI public resources, the involvement of private sector investment in the RDI field, the compliance with the priority areas

specified in NSRF 2020, strengthening the research fields in which Romania has visible results, the predictability of the framework regulation, sustainability of investment in human resources, transparency and accessibility of information and independent evaluation, in the public interest.

At the level of Romania, the funds for research and development come from several programs, which are managed by the Ministry of Education and Scientific Research and the Ministry of Regional Development, Public Administration and European Funds.

The research, development and innovation activity at national level is thus funded through the *Regional Operational Program 2014-2020* (ROP 2014-2020) through Priority Axis 1: Promoting Technological Transfer and through the *Competitiveness Operational Program 2014-2020* (COP 2014-2020) through the Priority Axis 1: Research, Technological Development and Innovation (RDI) in support of economic competitiveness and business development, the source of funding being the European Regional Development Fund (ERDF). At the same time, the RDI activities are also funded from the *Human Capital Operational Program 2014-2020* (HCOP 2014-2020) through Priority Axis 3 - Jobs for Everybody and Priority Axis 6 - Education and Competencies.

Other possible financing sources that could support the research, development and innovation activities in the South-East Region are represented by the Cross-border Cooperation Programs (eg the Interreg V-A Romania-Bulgaria Program, the Black Sea Cross-border Cooperation Program), which although do not have dedicated axes for RDI, they support this area even tangentially.

The National Rural Development Program also supports the field of innovation, having a priority area of intervention directly targeting the innovation process: Field of Intervention 1A) Encouraging innovation, cooperation and the creation of a knowledge base in the rural areas.

Furthermore, another plan supporting R&D activities is the Sectoral Plan for R&D in Agriculture and Rural Development 2015-2018, "Agriculture and Rural Development - ADER 2020", which is oriented towards supporting innovative activities in the agricultural field. The plan is developed by the Directorate General for Food Industry and aims at identifying solutions tailored to the specific regional agro-ecological and climatic conditions that correspond to the current state of rural development of Romania, being designed to run for a period of 4 years, between 2015 and 2018.

This chapter presents briefly the main sources of funding for research, development and innovation activity in Romania, and more information and details on these programs and funding schemes can be found on the websites dedicated to the specific funding programs. The funding programs addressed in this strategy are:

- Horizon 2020;
- National Plan for Research - Development and Innovation 2015 - 2020 (NPRDI III);
- Regional Operational Program 2014-2020 (ROP 2014-2020);
- Competitiveness Operational Program 2014-2020 (COP 2014-2020);
- Human Capital Operational Program 2014-2020 (HCOP 2014-2020);
- Sectoral Agriculture and Rural Development Plan - ADER 2020;
- Interreg V-A Romania-Bulgaria Program;
- Black Sea Cross-Border Cooperation Program;
- The Danube Program 2014-2020.

Horizon 2020 Programme³⁶

Short description of the Programme:

Horizon 2020 is the most complex research and innovation program ever implemented by the EU. This will lead to more great innovations, discoveries, and world premieres, bringing the great ideas from laboratories to the market. It is available a financing of 80 billion euros for 7 years (2014-2020) - in addition to private investments and national public investments that this funding will attract.

The structure of the Programme:

A. *Scientific Excellence*

The scientific excellence, a competitive industry and addressing societal challenges are the core elements of Horizon 2020. The specific funding will ensure that the best ideas are quickly brought to market and used in the cities, hospitals, factories, shops and homes as soon as possible

The main actions financed under this objective are:

- **Border research funded by the European Research Council (ERC)**

The research driven by curiosity at the frontiers of knowledge rarely explicitly supports the development of commercial products, the scientific discoveries stimulate innumerable innovations. However, the frontier research is often the first area for which funding is reduced in times of economic hardship. That is why, through the ERC, the EU wants to boost

³⁶ <http://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020>

https://ec.europa.eu/programmes/horizon2020/sites/horizon2020/files/H2020_RO_KI0213413RON.pdf

the investment levels. Excellence is here the only criterion for EU funding for individual researchers or team of researchers.

Financing: 13,095 billion EUR

- **Marie Skłodowska-Curie Actions**

The actions for training and career development contribute to the evolution of well-known researchers. The support is given to young and experienced researchers to enhance their career and skills through training or internships in other countries or in the private sector. Thus, they acquire new knowledge and experiences that enable them to fully develop their potential.

Financing: 6,162 billion EUR

- **Future and emerging technologies**

Maintaining the ability to develop new cutting-edge technologies will help Europe to maintain its competitiveness and create new highly skilled jobs, a proactive approach and one step ahead of others. EU funding is designed to help Europe become the best environment for responsible and dynamic multidisciplinary cooperation on new and future technologies.

Financing: 2,69 billion EUR

- **World Class Infrastructure**

The research equipment can be extremely complex and costly so that only one team of researchers - or even one country - can not afford to buy it, build it or operate it on their own. They can cost millions of euros and require the skills of leading experts around the world. EU funding helps pooling the resources for such large-scale projects, providing researchers across Europe with access to very modern and new infrastructure, to make possible the new and fascinating research actions.

Financing: 2,488 billion EUR

B. Leadership position in the industrial sector

In order to be the best in its field, Europe needs to invest in promising and strategic technologies, such as those used in advanced manufacturing and microelectronics. However, the public funding is not enough: the EU must encourage the business community to invest more in research and target those areas where it can work together with the public sector to stimulate innovation.

The main actions financed under this objective are:

- **Leadership position in generic and industrial technologies**

Horizon 2020 supports the revolutionary technologies needed to stimulate innovation in all the sectors, including information and communication technologies (ICT) and space domain.

The small and medium-sized enterprises (SMEs) - a key source of jobs and innovation - benefit from special attention under Horizon 2020. They can collaborate on projects within a consortium and can be supported through a dedicated tool, specifically designed for smaller businesses with a high innovation potential. The SME toolkit will be the key to achieving this goal by providing support to individual SMEs or SME consortia to assess the market viability of their ideas at the high risk stage and to help them develop more these ideas in a later phase. Financing is also available for counseling and guidance for businesses to identify and attract the private investors.

Financing: 13,557 billion EUR for the entire action

Financing: at least 3 billion EUR allocated for the SMEs tool

- **Access to risk financing**

Innovative enterprises and their organizations often face difficulties in accessing funding for new high-risk ideas or developing such ideas. Horizon 2020 contributes to remedying this "innovation gap" through loans and guarantees, as well as by investing in innovative SMEs and medium-sized small enterprises. The support is acting as a catalyst for attracting private funding and risk capital for research and innovation.

Financing: 2,842 billion EUR

C. Societal Challenges

The EU has identified seven priority challenges where specific investment in research and innovation can have a real impact for the benefit of citizens:

- **Health and welfare**

Investing in health research and innovation will help us stay active, develop new, safer and more effective treatments, and maintain the sustainability of our health and care systems. They will provide doctors with the tools for more personalized medicine and will bring advantages in the prevention and treatment of chronic and infectious diseases.

Financing: 7,472 billion EUR

- **Food security and sustainable use of biological resources**

In the EU, agriculture and forestry together with the food and bio-industrial sector provide a total of 22 million jobs and have a role in rural development and in the management of European natural heritage. The investments will be made to strike a balance between the use of renewable and non-renewable resources of land, sea or ocean origin, the transformation of waste into valuable resources and sustainable production of food, animal food, bioproducts and bioenergy.

Financing: 3,851 billion EUR

- **Sustainable energy**

Being the world's second largest economy, Europe is extremely dependent on the rest of the world for energy supply - a fossil fuel-based energy that accelerates climate change. That is why the EU has set ambitious climate and energy targets. EU funding through Horizon 2020 will have a key role to play in achieving these goals.

Financing: 5,931 billion EUR

- **An ecological and integrated mobility**

The transport issues - congestion, road safety, air pollution - have an impact on our daily lives and health. To address these issues, Horizon 2020 contributes to creating a sustainable transport system adequate to a modern and competitive Europe.

Financing: 6,339 billion EURO

- **Combating climate change, the environment, efficient use of the resources and raw materials**

. Addressing climate change is a cross-cutting priority of Horizon 2020 and it has 35% of the total budget allocated to the whole program. Waste and water are special priorities. Currently, the waste represents 2% of the EU's greenhouse gas emissions. Stimulating growth in the water industry by only 1% could create up to 20000 new jobs.

Financing: 3,081 billion EUR

- **Europe in a changing world - inclusive, innovative and reflective societies**

Horizon 2020 funds research actions on new strategies and governance structures to overcome the prevailing economic instability and ensure Europe's resilience to future crises, demographic change and migration trends. The financing also supports new forms of innovation such as open innovation, innovation in business models, public sector and social innovation to meet social needs. By supporting research and innovation on European heritage, identity, history and culture, and Europe's role in the world, the EU is also building "reflexive societies" to explore common values and their contribution to a common future.

Financing: 1,309 billion EUR

- **Safe societies - protecting the freedom and security of Europe and its citizens**

EU research and innovation actions are developing new technologies to protect societies while respecting private life and fundamental rights - two key values representing the core of the EU security research. These technologies have significant potential for stimulating economic activity by creating new products, services and jobs.

Financing: 1,695 billion EUR

D. Spreading excellence and extending participation

Research and innovation are essential for economic prosperity, so measures are needed to ensure the convergence and improvement of the innovation performance of all the Member States and their regions. Experience shows that when economic crises impose constraints on national budgets, disparities in innovation become more apparent across Europe. Exploiting the potential of Europe's talent pool and maximizing and sharing the benefits of innovation across the Union is the best way to strengthen Europe's competitiveness and its capacity to respond to societal challenges in the future.

Specific measures under Horizon 2020 include:

- creating teams that combine excellent research institutions and lower-performance homologous institutions to create or upgrade centers of excellence;
- twinning of institutions, including staff exchanges, expert visits and training courses;
- establishing "SEC academic positions" to attract renowned university experts to high-potential institutions;
- a policy support mechanism to improve national and regional research and innovation policies;
- fostering access to international networks for researchers and innovation in excellence;
- strengthening the transnational networks of national contact points (NCPs) to inform potential participants.

Financing: 816 million EUR

E. Science with and for society

An effective cooperation between science and society is needed for the recruitment of new talents for science and the association of scientific excellence with social awareness and accountability. This means to understand the issues from all the perspectives. That is why Horizon 2020 supports projects that involve citizens in the process of defining the nature of research that affects our

everyday lives. A wider understanding between the expert and non-specialist communities on the objectives and modalities of their achievement will maintain scientific excellence and enable society to share results.

Financing: 462 million EUR

F. Nuclear research for the benefit of all citizens

The EU research activities in the field of nuclear fission focus on safety and security, medical research, radiological protection, waste management, industrial uses of radiation, including many other areas such as the use of radiation in the agricultural sector. The EU research actions in the field of nuclear fusion are designed to demonstrate that fusion can become a viable source of energy for large-scale commercial exploitation within a reasonable timeframe by bringing together all stakeholders' efforts within a single joint European program .

Financing: 1,603 billion EUR

The National Plan of Research-Development and Innovation 2015 - 2020 (NPRDI III)³⁷

Role:

The National Research, Development and Innovation Plan III for the period 2015-2020 is one of the main instruments for implementing the National Strategy in this field.

Objectives:

The implementation of the National Research, Development and Innovation Plan III aims at achieving the following objectives:

- Transformation of the national RDI system into a functional, efficient national system of innovation with performance and impact at the European average for the systems in this category. In this respect, it is aimed, among others, the stimulation of the cooperation between the institutions of the public RDI system and the economic operators, as well as the encouragement of commercial exploitation of inventions and other scientific results,

³⁷ <http://www.research.ro/ro/articol/1434/programe-nationale>

<http://www.fonduri-structurale.ro/stiri/15694/planul-national-de-cercetare-dezvoltare-si-inovare-iii-pentru-perioada-2015-2020-aprobat-de-guvern>

especially by the Romanian legal persons.

- Ensure critical mass of researchers in the system and develop new generations of competitive researchers at international level.
- Increase the level and efficiency of public funding by concentrating resources on sectors of economic relevance and research potential (especially smart specialization areas) and stimulating private R&D expenditures through public co-financing to reach a level of 1% of GDP.
- Modernizing the administration of research and increasing the capacity of the central administration in the field.

Budget:

The total budget of the National Research, Development and Innovation Plan III for the entire period will be maximum 15 billion Ron and will be provided from the state budget funds, non-reimbursable external funds and partners' contributions to the projects.

Structure:

The National Research, Development and Innovation Plan III includes five programmes:

- Development of the national R&D system (the main types of projects to be implemented are doctoral/post-doctoral research projects, stimulating young independent teams, awarding of research results, complex projects for the reintegration of diaspora researchers, investment projects in research and development infrastructure of regional, national or pan-European interest, scientific and technological specialization projects etc.).
- Increasing the competitiveness of the Romanian economy through research, development and innovation (there will be considered projects that provide support for the development of models / solutions for new or significantly improved products, technologies, methods, systems, services, for the execution of prototypes / pilot installations, support for the outsourced research, in partnership with public research organizations, for the manufacturing / application / operation of products, new technologies / systems to the economic operator or other category of project beneficiary etc.).
- European and international cooperation, a program that supports the participation in international research projects in order to facilitate the mobility of researchers and their

access to programs and research institutions not available in Romania.

- Fundamental and frontier research, which aims at maintaining and developing niche domains, where Romanian fundamental research has a competitive advantage and a critical mass of researchers.
- Research in areas of strategic interest, support program led by institutions with a role of scientific coordination in areas of strategic interest for the formation and development of research institutions and national components in areas of strategic interest for Romania.

Programme 1 - Development of the national RD system

The objectives of Programme 1:

- developing human resources, infrastructure and institutions;
- increasing the efficiency of the use of resources in public organizations by developing mechanisms for monitoring and evaluating the quality and relevance of RDI activities;
- increasing the attractiveness of the system and opening the research organizations towards the international community;
- modernizing public administration in the research sector

Beneficiaries:

- Privat beneficiaries:
 - R&D units organized as enterprises
 - Enterprises, as well as their structures, implementing research and development activities
 - Authorised private higher education institutions, or their structures
 - Non-governmental organizations implementing research and development activities
- Public beneficiaries:
 - Research institute or centers organized within national societies, national companies and autonomous administrations
 - International research and development centers created under international agreements

The budget of the state aid scheme: 3,600 million Ron for the period 2015-2020

Types of projects that can be financed:

- Research projects: PhD/Post-PhD, including industrial PhD, Stimulation of creating Young Independent Teams, Scholarships for Young Researchers, Mobility of Researchers, Awarding the Research Results;
- RDI Support: Institutional Development, Investments, Integration and Interconnection.

Programme 2 - Increasing the competitiveness of the Romanian economy through RDI

The objectives of the Programme:

- stimulating the progress of the enterprises on the value chain and of the partnerships with public universities by maximizing added value in the production of innovative goods (technologies, products, services) based on scientific research (own or outsourced);
- increasing the ability of enterprises to absorb ultimate technology and adapt these technologies to the needs of target markets;
- creating a stimulating environment for the private sector initiative through entrepreneurship tools, support for the marketing of R&D results and the establishment of partnerships between economic operators, research organizations and the dissemination of knowledge, and possibly local public authorities;
- supporting smart specialization processes by concentrating resources in sectors of economic relevance and proven research potential through public-public and public-private partnerships - that lead to concentration, efficiency and effectiveness and to unlocking the identified potential;
- developing RDI activities in areas of general social interest, in order to increase the capacity of the public research sector to respond to the global challenges that affect Romania's economy.

Beneficiaries:

- Privat beneficiaries:
 - R&D units organized as enterprises
 - Enterprises, as well as their structures, implementing research and development activities
 - Authorised private higher education institutions, or their structures
 - Non-governmental organizations implementing research and development activities

- Public beneficiaries:
 - Research institute or centers organized within national societies, national companies and autonomous administrations;
 - International research and development centers created under international agreements.

The budget of the state aid scheme: 1.500 million Ron for the 2015 - 2020 period

Type of projects that will be financed under the scheme:

- Demonstrative experimental projects (concept demonstration);
- Experimental development projects;
- Projects of transfer to the economic operator;
- Projects of capitalization at the economic operator;
- Innovation circles;
- Oriented partnerships;
- Innovative clusters;
- Competence Centers;
- Contests;
- Technological platforms;
- Technological Transfer Centers;
- Training of human resources for technological transfer;
- Scientific park.

Programme 3 - European and international cooperation

The objectives of the programme:

- increasing the international competitiveness of Romanian research in attracting external funding for research;
- strengthening the national research-development and innovation system by enhancing international scientific co-operation;
- Romania's participation in the EU Framework Program for Research and Innovation - Horizon 2020, Joint Programming Initiatives (JPIs), European Innovation Partnerships

(EIPs), other European and international bilateral and multilateral initiatives, programs, organizations and conventions;

- representing Romania in pan-European and international research organizations and programs;
- increasing Romania's visibility in the field of research, development and innovation.

Beneficiaries

- Private beneficiaries:
 - R&D units organized as enterprises
 - Enterprises, as well as their structures, implementing research and development activities
 - Authorised private higher education institutions, or their structures
 - Non-governmental organizations implementing research and development activities
- Public beneficiaries:
 - Research institute or centers organized within national societies, national companies and autonomous administrations;
 - International research and development centers created under international agreements.

The budget of the state aid scheme: 3.000 million Ron for the 2015 - 2020 period.

Type of projects that will be financed under the scheme:

- Demonstrative integrated, innovative projects: supporting the participation of Romanian entities in joint technology initiatives with the aim of developing favorable conditions for investments in the field of knowledge and innovation at national level, in order to stimulate the competitiveness at European level, growth and employment work.
- RD projects and specific support: projects that are usually implemented for a limited period and are selected by the joint enterprise following open calls and competition.
- Specific support projects: collaboration and project partnership integration within the thematic areas.

Programme 4 - Fundamental and frontier research

The objective of the programme:

- developing fundamental research in the areas in which Romania established its national priorities through NSRDII 2020;
- increasing the qualitative performances and improving the international visibility of the scientific results in the areas where Romania has a research potential and where the results comparable with those of the EU countries have been obtained - increasing the contribution of Romania to the development of the European Research Area (ERA);
- developing emerging fields in which Romania has an interest in realizing scientific frontier research activities, contributing to technical and technological development and to improving the quality of life;
- adoption of international evaluation standards for fundamental research projects.

The main types of projects are:

- fundamental research projects;
- school of advanced studies;
- frontier research projects - tool for supporting the scientific results with applicative potential, to accelerate the transformation into new technologies of economic or social value;
- complex frontier research projects (including ERC-like, with the maintenance of the Romanian host institution and the proposed budget, condition for keeping the validity of the ERC assessment);
- "exploratory" Workshops - designed to identify the research niches.

Programme 5 - Research in areas of strategic interest

The objectives of the programme:

- supporting the participation of Romanian research institutions in international scientific institutions and programs to increase the national research capacity in areas of strategic interest;
- identifying research, technological and industrial niches at national, European and global

level;

- using international research and development resources through joint participation in European scientific organizations and programs to solve problems of strategic interest for Romania;
- obtaining visible and impact-oriented scientific results through international cooperation, knowledge transfer and technology with strategic applications;
- promoting industrial innovation in the sectors of strategic interest, development and diversification of applications of research in industrial activities;
- effective communication between research, educational, industrial and economic institutions in Romania, by popularizing scientific results in fields and sectors of strategic interest.

Types of projects:

- research, development, innovation projects;
- experiments, modeling, measurements or specific analyzes (not included in the RDI projects category);
- support projects for research;
- management support projects.

The budget of the state-aid scheme: 300 million Ron for the 2015 - 2020 period.

Regional Operational Programme 2014-2020³⁸

Role: The Regional Operational Program (ROP) 2014-2020 is the successor of the Regional Operational Program 2007-2013 and one of the programs through which Romania will be able to access European Structural and Investment Funds from the European Regional Development Fund (ERDF) in 2014-2020.

The Regional Operational Program (ROP) 2014-2020, managed by the Ministry of Regional Development, Public Administration and European Funds as Managing Authority, was adopted by the

³⁸ Ministerul Fondurilor Europene, <http://www.fonduri-ue.ro/>

European Commission (EC) on June 23, 2015.

Objectives:

The general objective of the ROP 2014-2020 is to increase the economic competitiveness and improve the living conditions of local and regional communities by supporting the development of the business environment, infrastructure and services for the sustainable development of the regions so that they can manage resources efficiently and capitalize on its potential for innovation and assimilation of technological progress.

PA 1 Promoting the technological transfer

Investment Priority 1.1. Promoting the investments in R&I, developing links and synergies between businesses, research and development centers and higher education, in particular promoting investments in product and service development, technology transfer, social innovation, eco-innovation and public service applications, stimulating demand, networking and clustering and open innovation through smart specialization, as well as support for technological and applied research activities, pilot lines, early product validation, advanced production and first generation capacities, especially in the field of generic technologies and the diffusion of general-purpose technologies

Specific objective: Increasing the innovation in companies by supporting innovation and technology transfer entities in smart areas of expertise

The allocated value 165 mil. EURO (FEDR)

Types of activities

Creating, upgrading and expanding innovation and technology transfer infrastructures, including endowment

Potential beneficiaries

Legally-constituted entities that develop or create a technology transfer infrastructure.

The Competitiveness Operational Programme 2014-2020³⁹

Role: The Competitiveness Operational Program (COP) supports investments that address the needs and challenges of low levels of economic competitiveness, in particular with regard to (a) insufficient support for R & D and innovation (RDI), and (b) underdeveloped ICT infrastructure and implicitly poorly developed services, thus positioning itself as a factor generating horizontal interventions in the economy and society, capable of enhancing growth and sustainability.

Objective: The general objective of the COP is to contribute to the overall objective of the Partnership Agreement by supporting RDI and ICT for competitiveness and development. The COP proposes solutions to the needs and challenges related to the low level of economic competitiveness at national level, notably with regard to (a) insufficient RDI support and (b) underdeveloped ICT infrastructure and therefore poorly developed services. These two shortcomings, along with other structural weaknesses, such as the fragile business environment or low productivity in industry and services, make it impossible to use the existing competitive potential.

Priority Axis 1 - Research, Technological Development and Innovation (RDI) supporting the economic competitiveness and business development

1.1. Promoting investments in R&I, developing links and synergies between businesses, research and development centers and higher education, in particular promoting investment in product and service development, technology transfer, social innovation, eco-innovation and public service applications, stimulating demand, networking and clustering and open innovation through smart specialization, as well as supporting technological and applied research activities, pilot lines, early product validation actions, advanced production capacities and first generation capabilities, particularly in the field of key enabling technologies and the diffusion of general use technologies

SO 1.1 Increasing RDI capacity in smart specialization areas and health

SO 1.2 Increasing Romanian participation in research at EU level

SO 1.3 Increasing private investment in RDI

SO 1.4 Increasing the knowledge transfer, technology and staff with RDI skills between the public

³⁹ Ministerul Fondurilor Europene, <http://www.fonduri-ue.ro/>

research and the private environment

Action 1.1.1: Large RD infrastructures

Beneficiaries:

- R&D public institutions or universities - for type "a" projects
- companies with RD activity mentioned in the statute - for type "b" projects
- entities managing innovative cluster structures for type "c" projects.

Action 1.1.2: Dezvoltarea unor rețele de centre CD, coordonate la nivel național și racordate la rețele europene și internaționale de profil și asigurarea accesului cercetătorilor la publicații științifice și baze de date europene și internaționale

Developing RDI networks, coordinated at national level and connected to European and international networks and providing researchers with access to scientific publications and European and international databases

Beneficiaries:

- Public and / or Private Research Organizations (RD and higher education institutions) - for GRID type projects
- The RoEduNet Administration Agency - for the RoEduNet development project
- ANELIS PLUS for the project dedicated to the access of researchers to international scientific databases.

Action 1.1.3 Creating synergies with RDI actions of the EU's Horizon 2020 framework program and other international RDI programs

Beneficiaries:

Public and / or private law research organizations and large, medium or small enterprises wishing to apply and / or have a steady participation in EU research framework programs or other international R&D programs.

Action 1.1.4 Attracting staff with advanced skills from abroad to strengthen the RD capacity

Beneficiaries:

Public and / or Private Research Organizations and Large, Medium or Small Entities with RD activity as stated in the Statute

Action 1.2.1: Stimulating companies' innovation demand through RDI projects run by businesses individually or in partnership with R&D institutes and universities for the purpose of product and process innovation in economic sectors with potential for growth

Beneficiaries:

The action is primarily aimed at the following categories of applicants:

- Large, medium or small enterprises for which the RD activity is not the main activity. The R&D activity may not exist in the business object of the enterprise
- Spin-offs: Businesses to be set up on the basis of a result obtained from a research project of a public law research organization (RD institution or higher education institution). This action will fund "spin-off" projects that provide a researcher or group of researchers with the opportunity to get away from the public institution where they have developed a research project and achieved a result in order to continue within the firm of the solution investigated until its completion in order to produce and market the results on the market
- Innovative start-ups: Businesses that are up to 3 years old in the year of submitting the project and have a business plan based on a RD result or industrial property right
- Innovative start-ups (defined in accordance with Block Exemption Rule No.651 / 2014 Article 22, paragraph (2), combined with Article 2, paragraph (80)).

Action 1.2.2: Credit instruments and risk capital measures in favor of innovative SMEs and market research organizations responding to market demands

Beneficiaries:

According to the ex-ante evaluation in accordance with Article 37 of Regulation (EU) No 1303/2013

Action 1.2.3: Knowledge Transfer Partnerships

Beneficiaries:

The research organizations (RD and higher education institutions) whose activity has marketing

potential are the project beneficiaries (applicants) and the companies that access the offer of these organizations are the actual beneficiaries of the project activities.

Value assigned for PA 1: EUR 952.57 million

Human Capital Operational Programme 2014-2020

Role: The Human Capital Operational Program establishes the investment priorities, specific objectives and actions undertaken by Romania in the field of human resources, thus continuing the investments made through the European Social Fund in the period 2007-2013 and at the same time contributing to the achievement of the general objective of the Partnership Agreement (PA 2014-2020) - implicit of the European Structural and Investment Funds in Romania, namely to reduce the disparities in economic and social development between Romania and the EU Member States.

With planned integrated interventions in the field of employment, social inclusion and education, the HC OP will act as a means of stimulating economic growth and cohesion and will also support the achievement of the objectives established in other development challenges - competitiveness, infrastructure, administration and governance - contributing to the achievement of Romania's objectives in the context of the Europe 2020 Strategy for Smart, Sustainable and Inclusive Growth.

Priority Axis 3 - Jobs for all

Investment Priority 8iii. Self-employment, entrepreneurship and business start-ups, including micro-enterprises and innovative small and medium-sized enterprises

Specific objective 3.7 Increasing employment by supporting non-agricultural enterprises in the urban area

Activities

Support granted to individuals to open a business

- Granting financial support to individuals for setting up business - a non-refundable amount that can be supplemented by the possibility of recourse to financial products (their type

will be highlighted by ex-ante analysis

- Provide personalized counseling / consultancy services (eg business plan, legal advice, accounting, marketing, business improvement, business development, etc.), entrepreneurial training and other forms of support (eg mentoring), both at the setting-up phase of the business, as well as in the post-setting phase
- Support for already established SMEs (with a history of being functional up to one year) to create new jobs
- Granting subventions to create new jobs in the existing SMEs
- Providing counseling / consulting services (eg business plans, legal advice, accounting, marketing, business practices, business development, etc.), entrepreneurial training and other forms of support (eg mentoring) for developing the business.

Potential beneficiaries

- The administrators of the entrepreneurship scheme (if opting for this implementation mechanism)
- For financial instruments, potential beneficiaries could be highlighted by the ex-ante analysis in accordance with art. 37 of Regulation (EU) No. 1303/2013
- Individuals who intend to set up a business
- Non-agricultural SMEs in urban areas

Total allocated amount:

1,270,959,911 Euro for less developed regions

24,853,622 Euro for Bucharest-Ilfov Region

Priority Axis 6 - Education and competences

Investment Priority 10ii. Improving quality and efficiency and access to tertiary education and its equivalent in order to increase participation and levels of education, especially for disadvantaged groups.

Specific objectives:

6.7. Increased participation in tertiary and non-university tertiary education organized in higher education institutions authorized especially for vulnerable groups.

Activities

- Establishment and use of integrated packages of educational assistance and financial support measures including, for example: scholarships, mobility, networking and virtual distance learning communities, whose award will be conditioned by graduating tertiary / continuing the studies, in order to increase the number of students and graduates in tertiary education;
- Supporting access to tertiary education through joint activities with pupils, students and teaching staff (eg counseling, information activities, organizing visits to universities, etc.) as well as awareness raising campaigns to increase the participation rate in tertiary education and to ensure the understanding of the benefits that higher education offer in terms of job opportunities;
- Other innovative actions supporting participation in tertiary education, including transnational cooperation activities.

Potential beneficiaries:

- Ministry of National Education;
- Agencies, structures under the coordination / subordination of MNE and other public bodies with attributions in the field of higher education;
- Authorised public and private higher education institutions;
- Social partners in higher education;
- NGOs, including student associations.

6.8 Implementation of systemic measures in tertiary university and non-university education organized within authorised higher education institutions in order to facilitate the adaptation to the requirements of the labor market.

Activities:

- Updating the national system of external quality assurance / evaluation, through the involvement of the social partners. Analyzing and capitalizing on the results of previous studies / analyzes on the socio-professional insertion of graduates;
- Develop and implement a multi-level qualification system based on the promotion of flexible career paths with a focus on acquiring skills and competencies relevant to the labor market;
- Other innovative actions supporting access to tertiary education, including transnational cooperation activities.

Potential beneficiaries:

- Ministry of National Education and its subordinate authorities;
- Agencies, structures under the coordination / subordination of MNE and other public bodies with attributions in the field of higher education, including in the assurance and management of the quality and the National Qualifications Framework in Higher Education;
- Authorised public and private higher education institutions;
- Social partners in higher education (eg trade unions) / Social partners / trade unions / sector committees / institutions and organizations members of the Regional Pacts and Local Partnerships for Employment and Social Inclusion;
- NGOs, including student associations.

6.9 Improving the level of competencies of the teaching staff in tertiary university and non-university education organized within the authorised higher education institutions in terms of innovative educational content and modern and flexible learning resources.

Activities

- Specialized professional training for the teaching staff in tertiary university and non-university education organized in authorised higher education institutions in terms of innovative educational content and modern and flexible learning resources, through partnerships with economic agents, traineeships with agents economic exchanges, exchange of experience and dissemination of good practices;
- Capitalizing on the results of the previous teaching staff mobility programs of ERASMUS+ in order to complete their initial / continuing training in relation to the training areas established under this IP. The actions envisaged are also based on consultations with international research and business networks, complementing those at national level;
- Other innovative actions, through transnational cooperation activities in the areas of training, research and innovation.

Potential beneficiaries:

- Ministry of National Education and its subordinate authorities;
- Authorised public and private higher education institutions;
- Agencies, structures under the coordination / subordination of MNE and other public bodies

with attributions in the field of higher education, including the assurance and management of quality and the National Qualifications Framework in Higher Education;

- Social partners in higher education (eg trade unions).

6.10 Diversification of educational offers in tertiary university and non-university education organized in the authorised higher education institutions correlated with the labor market needs in the economic sectors / domains identified by CNS and NSRDI.

Activities

- Developing innovative educational offers in tertiary university and non-university education organized in authorised higher education institutions to promote quality learning experiences (eg modern and flexible learning resources, promoting entrepreneurship education, etc.) through the correlation with the labor market needs in the economic sectors with competitive potential identified according to the CNS and in the fields of smart specialization according to NSRDI.

Potential beneficiaries:

- Authorised public and private higher education institutions;
- Partners for higher education in public and private and non-governmental environments.

Investment Priority 10iv. Increasing the labor market relevance of education and training systems, facilitating the transition from education to the labor market and strengthening training and training systems and their quality, including skills anticipation mechanisms, adaptation of curricula and the establishment and development of workplace learning systems, including dual learning systems and apprenticeship programs

Specific objectives:

6.13 Increasing the number of university and non-university tertiary education graduates that find a job as a result of access to learning to a potential job / research / innovation focusing on the economic sectors with competitive potential identified according to the NCS and the domains of

smart specialization according to NSRDI

Activities:

- Supporting the conclusion of sustainable partnerships with the private sector to facilitate the transition from education to work through the establishment of a functional system of practical internships at a potential employer, internship programs / workplace learning programs, etc. addressed to students and college students organized at higher education institutions (ISCED 4-7), by encouraging the employers to get engaged in workplace learning programs;
- Organizing and conducting practical learning programs, providing vocational guidance and counseling services focused on the acquisition of cross-cutting skills correlated with the needs of the labor market, entrepreneurial skills training through the simulated enterprise, especially in the economic sectors with competitive potential identified according to the NCS and smart specialization areas according to NSRDI for students (ISCED 4-8);
- Support for strengthening the partnerships between universities and research and innovation actors to stimulate the development of new doctoral and postdoctoral programs with direct applications in the economy, with particular attention to the economic sectors with competitive potential identified according to the NCS and smart specialization areas according to NSRDI, by providing financial support to PhD students and supporting researchers to get involved in post-doctoral research, through scholarships and support for internal and transnational mobility
- Network research and networking activities for young researchers in order to create synergies between research and innovation, especially in terms of complementarity with the economic sectors with competitive potential identified according to the NCS and the smart specialization areas according to NSRDI, in support of the internationalization tertiary education;
- Creating a coordinated information system in both directions: from companies / private sector to higher education institutions on their training needs and from business education institutions to respond to the needs of the private sector at regional / local level.

Potential beneficiaries:

- MECS and the relevant, subordinate / coordinated structures / agencies / bodies;

- Agencies, structures, bodies subordinated / coordinated by MECS and other public bodies with attributions in the field of higher education and scientific research;
- Authorised public and private higher education institutions;
- Doctoral and graduate legal schools, including partnerships between them and the private sector / RDI centers;
- Authorised Research Institute / Centers, including research institutes of the Romanian Academy;
- Romanian Academy;
- Employers;
- Professional Associations;
- Chambers of Commerce and Industry;
- Institutions and organizations that are members of the Regional Pacts and Local Partnerships for Employment and Social Inclusion.

Total allocated amount:

1,393,631,965 Euros for less developed regions

85.004.079 Euro for Bucharest-Ilfov Region

Interreg V-A Romania-Bulgaria Programme⁴⁰

Role: The Interreg V-A Romania-Bulgaria Programme aims to expand the region's horizons in order to achieve concrete and measurable results and to allow the region to become a region where people can live, study, work, visit and invest. The program supports the process of creating competitive and sustainable communities through the efficient use of resources, the promotion of profitable initiatives and the opportunities offered by the development of transversal and horizontal flows in the Danube / Black Sea corridor. The overall vision of the area covered by this program is that by exploiting its geographical position as a gateway to the eastern area of the Danube / Black Sea corridor and as a focal point in the wider context of the Black Sea-Danube-Rhine-Sea North to support the development of the cross-border area by improving accessibility,

⁴⁰ http://ec.europa.eu/regional_policy/ro/atlas/programmes/2014-2020/romania/2014tc16rfcb021
<http://www.interregrobg.eu/ro/program/program-date-generale.html>

promoting institutional cooperation and protecting and developing regional assets.

The total budget of the program is 258,504,126 euro (of which € 215,745,513 - ERDF) and the allocated funds are divided into the six priority axes:

1. A well-connected region (96,450,936 euros)
2. A green region (63,454,564 euros)
3. A secure region (€ 48,225,468)
4. A qualified and inclusive region (€ 17,767,279)
5. An efficient region (€ 12,690,913)
6. Technical Assistance (19,914,966 euros)

Specific objectives:

- improving the planning, development and coordination process of cross-border transport systems in order to ensure better connections to the TEN-T transport networks;
- increasing the safety of transport by river or sea;
- improving the sustainable use of natural resources and heritage;
- improving the sustainable management of ecosystems in the cross-border area;
- improving joint risk management across the border area;
- encouraging the integration of the cross-border area in terms of employment and labor mobility;
- increasing the cooperation capacity and efficiency of public institutions in the context of cross-border cooperation.

The Black Sea Cross-Border Cooperation Programme⁴¹

Role: The Black Sea Cross-Border Cooperation Programme aims to improve the living standards of people in the Black Sea Basin regions through sustainable growth and environmental protection.

Thematic objectives

1. Promoting business and entrepreneurship in the Black Sea Basin

⁴¹ <http://www.mdrap.ro/dezvoltare-regionala/-4970/-7572>

2. Promoting a coordinated environmental policy and reducing maritime waste by joint actions in the Black Sea Basin

The eligible area of the Programme:

Romania: South-East

Bulgaria: Severoiztochen, Yugoiztochen

Greece: Kentriki Makedonia, Anatoliki Makedonia Thraki

Turkey: TR10 (İstanbul), TR21 (Tekirdağ, Edirne, Kırklareli), TR42 (Kocaeli, Sakarya, Düzce, Bolu, Yalova), TR81 (Zonguldak, Karabük, Bartın), TR82 (Kastamonu, Çankırı, Sinop), TR83 (Samsun, Tokat, Çorum, Amasya) și TR90 (Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane)

Russia: Rostov Oblast, Krasnodar Krai, Republica Adygea

Ukraine: Odessa, Mykolaiv, Kherson, Zaporosh'ye și Donetsk Oblasts, Republica Crimeea, Sevastopol

Moldovia, Georgia, Armenia, Azerbaijan: the whole territory

The Danube Transnational Programme⁴²

Role: The Danube Region's transnational cooperation program aims to stimulate innovation and entrepreneurship, to preserve the natural and cultural heritage of the Danube region, to improve connectivity and support the transition to a low-carbon economy.

The Danube Transnational Program finances transnational cooperation projects in line with the priorities of the EU Strategy for the Danube Region (EUSDR).

The geographical focus of the program corresponds to the area covered by the strategy and includes regions from nine Member States (Austria, Bulgaria, Croatia, Czech Republic, Hungary, Germany, Romania, Slovakia and Slovenia) as well as from three non-EU countries (Bosnia and Herzegovina, Serbia and Montenegro).

Thematic priorities

The transnational program for the Danube region is based on four thematic priorities:

⁴² <http://mdrap.ro/dezvoltare-regionala/-4970/-7572/-7498>

1. An innovative and socially responsible Danube region: promoting innovation, knowledge transfer and entrepreneurship
2. An ecological Danube region: preserving and managing the natural and cultural heritage of the Danube region
3. A more connected and more energy-responsible Danube region: developing safe and sustainable transport systems, promoting energy efficiency
4. A well-governed Danube region: providing support for the implementation of the EU Strategy for the Danube Region and improving legal and policy frameworks to address major societal challenges such as labor market measures, education systems, demographic changes, etc.

Priority Axis 1 - Innovation and Social Responsibility in the Danube Region aims to achieve the following specific objectives:

- Improving the framework conditions for innovation
- Increasing competencies for innovation in the social environment and the business environment

Types of projects

The transnational cooperation projects must have the following characteristics:

- Partners from at least 3 participating states in the program
- Development, implementation, financing and staff with the input of all partners
- Transnational character of actions
- Pre-investment actions - no large investments, but possibly pilot projects

Eligible beneficiaries

- Local / regional / national authorities
- Public bodies
- European Groupings of Territorial Cooperation (EGTC)
- International organizations
- Private organizations, including SMEs

The National Rural Development Programme 2014-2020⁴³

Role:

The NRDP responds to 3 of the development challenges set out in the Partnership Agreement:

- Competitiveness and local development
- People and society
- Resources

Through the NRDP, 14 rural development measures will be financed with a financial allocation of 9.363 billion Euro, out of which 8.015 billion EAFRD and 1.347 billion national contribution.

The NRDP (funded by the European Agricultural Fund for Rural Development) supports the strategic development of the rural area through the strategic approach of the following objectives:

- SO1 Restructuring and increasing the viability of agricultural holdings
- SO2 Sustainable management of natural resources and combating climate change
- SO3 Diversification of economic activities, job creation, improvement of infrastructure and services for improving the quality of life in rural areas (P6)

The main rural development priorities for the 2014-2020 programming period:

- Modernizing and increasing the viability of agricultural holdings through their consolidation, market opening and processing of agricultural products;
- Encouraging rejuvenation of farmers' generations by supporting the setting up of young farmers;
- Development of basic rural infrastructure as a prerequisite for attracting investments in rural areas and creating new jobs and implicitly the development of the rural area.
- Encouraging the diversification of the rural economy by promoting the creation and development of SMEs in non-agricultural sectors in rural areas;
- Promoting the fruit sector as a sector with specific needs through a dedicated subprogram;
- Encourage local development under the responsibility of the community through the LEADER approach. LEADER cross-cutting competence improves competitiveness, quality of life and

⁴³ <http://www.pndr.ro>, www.madr.ro

diversification of the rural economy, as well as combating poverty and social exclusion.

In order to achieve the strategic objective 1, the following types of intervention will be financed through the NRDP measures:

- Establishing, extending and upgrading farm facilities (buildings, access roads, irrigation, pollution reduction and renewable energy technologies, storage facilities, marketing and processing, inclusion in the context of short chains, etc.) ;
- Investments in processing and marketing, including energy efficiency, marketing, storage, conditioning, adaptation to standards, etc .;
- Support for the restructuring of farms, especially small ones, and the rejuvenation of farmers' generations;
- Risk management in the agri-food sector;
- Counseling and training activities, through producer groups.

In order to achieve the strategic objective 2, the following types of intervention will be financed through the NRDP measures:

- Afforestation of agricultural and non-agricultural land and the realization of forest curtains on these lands;
- Compensatory payments to farmers who voluntarily undertake agri-environment commitments;
- Compensatory payments to farmers who voluntarily commit themselves to adopting or maintaining practices and methods specific to organic farming;
- Compensatory payments to farmers who voluntarily commit to continue their activity in designated areas as areas experiencing natural constraints or other specific constraints.

In order to achieve the strategic objective 3, the following types of intervention will be financed by the NRDP measures:

- Supporting the investments for micro-enterprises and small non-agricultural enterprises in rural areas;
- Improvement of local infrastructure (water supply systems, sewage systems, local roads), educational, medical and social infrastructure;

- Restoration and preservation of cultural heritage;
- Support for local strategies that provide integrated approaches for local development⁴⁴.

Measures related to innovation:

The NRDP 2014-2020 is structured on several areas of intervention, one of which is the 1A) Encouragement of innovation, cooperation and the creation of a knowledge base in rural areas.

The measures corresponding to this area of intervention are:

- M01 - Transfer of knowledge and information actions (art 14)
- M02 - Counseling services (art 15)
- M16 - Cooperation (art 35)

In order to encourage innovation, cooperation and the creation of a knowledge base in rural areas, support measures for knowledge transfer and information actions (M1), advisory services (M2) and cooperation (M16) are established.

The vocational training will support measures to restructure and modernize farms to increase competitiveness and productivity. Information and demonstration actions (MS 1.2) will support the encouragement of innovation and the consolidation of farmers' knowledge in innovative themes, methods and practices, but with practices leading to environmental protection. Targeted through SM 1.2, farmers will have access to knowledge and information to better manage the risks to which farms are exposed.

The advisory services will also support the restructuring and modernization of farms, the renewal of farmers' generations, the diversification of rural economic activities, and the organization of the agri-food chain through counseling and introducing new methods and practices into business development plans. Facilitating farmers' access to the value chain and promoting cooperation will be supported through SM 16.4. Encouraging innovation in the agri-food sector and the creation of a knowledge base will be supported by SM 16.1. by disseminating the results of the topics of innovation of the operational groups.

The establishment of the NRDP will also increase the awareness of agri-food and rural actors through dissemination activities such as conferences, seminars, newsletters, etc.

The choice and combination of these measures will complement the national public support for

⁴⁴ www.fonduri-ue.ro

vocational training and advice and promote the use of innovative methods and techniques.

Sectoral Plan ADER 2020⁴⁵

Role: The ADER 2020 Sectoral Plan aims to find solutions and provide solutions tailored to the specific regional agro-eco-climatic conditions that correspond to the current state of rural development of Romania. In the context of climate change, innovative solutions for adaptation of crop and livestock farming techniques and technologies should be found so that agricultural holdings can contribute to increasing the share of agriculture in the value of gross domestic product. It is also imperative to find viable solutions for the conservation and sustainable exploitation of Romania's agricultural resources (soil, water, plant genetic resources, animal genetic resources, labor force, financial resources). The mobilization of agricultural research efforts in order to address the challenges facing the Romanian society by the globalization phenomenon of the world economy on the one hand and the consequences of climate change call for a fundamental new approach to the research topics of the projects sectoral type.

General objectives:

- adaptation of plant cultivation and animal husbandry technologies to mitigate the effects of climate change;
- improvement of plant culture systems and technologies to ensure the sustainability of commercial farms in the context of increasing environmental performance,
- increasing the competitiveness of semi-subsistence farms;
- assessing the potential of public environmental goods offered by agricultural holdings in the context of harnessing local specificity for agro-livestock production;
- improving the management of agro-ecosystem resources in order to preserve the biodiversity and the degree of economic sustainability of the agricultural and zootechnical exploitation systems;
- developing the administrative capacity of central and local government, economic agents to develop and implement public policies, strategies and programs at national and regional level in the field of ensuring national food security and achieving the Europe 2020 strategic

⁴⁵ Order on the approval of the Sectoral R&D Plan for Agriculture and Rural Development of the Ministry of Agriculture and Rural Development, 2015-2018, "Agriculture and Rural Development - ADER 2020", Nr. 708 / 04.23.2015

objectives;

- sustainable development of animal husbandry, qualitative increase of the population of the farm species and efficiency of zootechnical production;
- improving and developing the range of food products and their safety in line with national and international requirements.

Chapter VI. Integration of monitoring and evaluation mechanisms

In order to ensure a successful and efficient implementation of the Smart Specialization Strategy of South-East Development Region, it is necessary, in addition to the relevance of the actions planned for regional development, to take into account the capacity to monitor and evaluate the results of the implementation actions proposed so as to ensure that the objectives established in the strategy are reached and that the level of compliance with the established action lines is constantly monitored. Also, if necessary, the monitoring and evaluation of the strategy will allow the future actions to be adjusted according to the context of their implementation so that the objectives and outcomes are achieved.

The monitoring process has the role of verifying that the activities are properly planned and whether the funds are properly used to obtain their immediate performance indicators. At the same time, the evaluation process has the role of analyzing the effects of the actions undertaken (their contribution to the observed changes and measured through the result indicator).

The monitoring activity for the implementation of the Smart Specialization Strategy of the South-East Region can be subsumed, from the perspective of the financial and human resources involved, to the monitoring activity of the implementation of the projects to be funded under the ROP 2014-2020 and COP 2014-2020, in the context of which activities and results of the strategy can be linked to these funding programs, managed at regional level by the South East Regional Development Agency.

Moreover, for monitoring the strategy, it is proposed to collect data and information from sources such as the National Institute for Statistics databases and the ROP and COP Annual Implementation Reports.

In the following section there are presented the indicators proposed at the level of the monitoring and evaluation system of the strategy. The time frame for implementing the strategy is the 2018-2023 period, and the milestones for its assessment are 2020 and 2023, when it is proposed to develop Monitoring Reports for the Smart Specialization Strategy of the South East Region, containing information about the period covered by the monitoring report, a description of the activities carried out in the monitoring process, a presentation of the measures and actions covered by the monitoring process, and opinions on the progress made in implementing the Smart

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Specialization Strategy. The monitoring reports will be discussed with members of the Regional Innovation Consortium in order to analyze the progress of the implemented actions and to formulate recommendations for the future implementation of the strategy. Furthermore, the Regional Innovation Consortium will also have the role of evaluating the implementation stage of the strategy, based on the proposed indicators.

In this context, a methodology for monitoring and evaluating the strategy is proposed, aiming to define a set of indicators that measure the level of innovation and the results proposed in the field of research, development and innovation. The mechanism proposed for monitoring the strategy envisages the definition of three categories of indicators, as follows:

- Context indicators, which have the role of placing the region's position compared with the national / European level;
- Result indicators that measure the contribution to the overall objectives and check whether the change occurs in the proposed direction (and the causes);
- Output performance indicators that measure the progress of the actions undertaken.

Considering that the Smart Specialization Strategy of the South-East Development region does not define an own financial plan, the indicators proposed for the monitoring and evaluation of the strategy will not have assigned numerical values, but they will be measured from the point of view of their evolution during the proposed period of time. Thus, the following evolutionary symbols are proposed:

Symbol for the evaluation of the indicator trend	Significance
+ +	Highly positive evolution of the indicator
+	Positive evolution of the indicator
+/-	Uncertain evolution of the indicator
-	Negative evolution of the Indicator
- -	Strong negative evolution

We also mention that the sources of information to collect data on the following indicators are:

- statistical data provided by the National Institute of Statistics (eg TEMPO Online Database);
- Statistical data provided by EUROSTAT;

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- Annual Implementation Reports of ROP 2014-2020 and COP 2014-2020 and other Operational Programs that fund RDI projects, that will be elaborated by the Managing Authorities / Intermediate Bodies (based on SMIS data).

a. Context indicators

In line with the development perspective from the smart specialization point of view at the level of the South-East Development Region, the context of regional development will be monitored from the perspective of two dimensions: economic and socio-demographic.

Nr. crt.	Dimension	Proposed indicator	Unit of measure	The estimated evolutive trend
1	Economic	The Gross Domestic Product at regional level	Ron	++
2		Active local units	Number	+
3		Innovative businesses	Number	+
4		Expenses with RDI activity	Ron	+
5	Socio-demographic	Workforce	Number	+/-
6		Researchers	Number	++

b. Result indicators

In order to provide specific indications for the implementation of the strategy, specific objectives have been defined, whose progress is quantified in the following output indicators:

Nr. crt.	Specific objective	Proposed indicator	Unit of measure	The estimated evolutive trend
1	Increasing the share of expenditures in the RDI activity in regional GDP	Share of expenditures with RDI activity in regional GDP	Percentage	++
2	Increase the number of staff involved in RDI activities at the	Number of staff involved in RDI	Number	++

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Nr. crt.	Specific objective	Proposed indicator	Unit of measure	The estimated evolutive trend
	level of RDI entities	activities		
3	Creating mechanisms to facilitate the transfer of RDI results to potential users: economic agents, public institutions, NGOs, etc.	Number of projects that facilitate the transfer of RDI results to potential users	Number	+
4	Increasing the number of entities that apply essential generic technologies in their work	Number of entities that apply essential generic technologies in their work	Number	+

c. Output indicators

At the level of the Smart Specialization Strategy of the South-East Development Region, 9 strategic priorities related to the fields of smart specialization and 5 transversal priorities have been defined, which will synergistically contribute to the achievement of the general objective and the specific objectives proposed within the strategy. For these priorities, the following set of immediate output indicators has been defined.

Nr. crt.	Priority	Proposed indicator	Unit of measure	The estimated evolutive trend
1	Strategic Priority 1. Reducing environmental pollution by using biotechnologies	Number of projects using biotechnologies to reduce pollution	Number	+
		Number of researchers involved in biotechnology development	Number	+
2	Strategic Priority 2. Increasing the quality and quantity of food products through agro-food biotechnology	Number of projects that created safe, affordable, and nutritionally optimized food	Number	+/-

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Nr. crt.	Priority	Proposed indicator	Unit of measure	The estimated evolutive trend
		Number of RDI personnel involved in the development and application of agro-food biotechnologies	Number	+
		Number of entities realizing food using agro-food biotechnology	Number	+
3	Strategic Priority 3. Supporting the adoption of SMART CITY solutions at the regional level	Number of functional partnerships for implementing SMART CITY solutions	Number	+
		Number of RDI staff involved in the development and implementation of SMART CITY solutions	Number	+
4	Strategic Priority 4. Innovative solutions in the shipbuilding and repairing field with minimal impact on the environment	Number of public-private RDI partnerships in the field of shipbuilding and ship repair	Number	+
5	Strategic Priority 5. Digitalization of ports and shipping transport and reducing the harmful environmental impact	Number of public-private partnerships for RDI in the field of digitization of ports and shipping.	Number	+
6	Strategic Priority 6. Supporting the research, development and innovation to capitalize on alternative energy sources	Number of projects using alternative energy sources	Number	+
7	Strategic Priority 7. Investments in eco-technologies to reduce the environmental pollution	Number of projects using eco-technologies to reduce environmental pollution	Number	+
8	Strategic Priority 8. Innovative solutions to promote the tourism	Number of projects promoting ecological tourism	Number	++
		Number of projects using innovative technical solutions to simplify tourist activities	Number	+

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Nr. crt.	Priority	Proposed indicator	Unit of measure	The estimated evolutive trend
9	Strategic Priority 9. Supporting product and process innovation in the clothing industry	Number of projects in the clothing field proposing innovative activities	Number	+
		Number of process innovations realized in the clothing industry	Number	+
		Number of product innovations realized in the clothing industry	Number	+
10	Horizontal priority 1. Supporting the application of Key Enabling Technologies (KET) at the level of smart specialization domains	Number of projects providing Key Enabling Technologies - KET	Number	+/-
		Number of RDI staff involved in projects providing key enabling technologies (KET)	Number	+
11	Horizontal priority 2. Supporting the implementation of information and communication technology (ICT) at the level of smart specialization domains	Number of contracts related to the consolidation of technology transfer partners relationships	Number	+
		Number of employees involved in ICT implementation at the level of smart specialization domains	Number	+
		Number of contracts / agreements to achieve technology transfer	Number	+
12	Horizontal Priority 3. Support for the enterprises implementing research, development and innovation activities	Total RDI spending at the level of smart specialization domains	Ron	+
		Number of employees performing RDI activities at the level of smart specialization domains	Number of persons	+
		Number of patents registered by private entities	Number	+/-
13	Horizontal Priority 4.	The number of new RDI-	Number	+/-

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Nr. crt.	Priority	Proposed indicator	Unit of measure	The estimated evolutive trend
	Supporting the innovative clusters	based services developed by clusters for active partners		
		Number partners registered to clusters	Number	+
		The number of new RDI clusters in smart specialization areas	Number	+
14	Horizontal Priority 5. Development of human capital involved in RDI activities	Number of RDI staff in the public and private environment	Number of persons	+
		Number of RDI staff benefiting from training	Number of persons	+

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