INSTRUMENTS TO SUPPORT THE QUATERNARY SECTOR IN THE ROMANIAN CONTEXT

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ABSTRACT

The aim of this paper is to identify the link between industrial parks, clusters, incubators and those branches of activity generating/ potential generating growth and jobs in Romania. Through a theoretical approach of the issue and given the data available at national level, this undertaking was focused on the role of competitiveness in developing economic sectors based on smart specialisation, on the quaternary sector support instruments, as well as on the impact business incubators, clusters and industrial parks have on increasing employment by stimulating the emergence and development of SMEs. The tertiary sector is both condition and consequence of the technical progress and the link between services and material production is made by advanced technologies included in the quaternary sector. The government can support the development of this sector in particular by expanding the hard and soft infrastructure, educating and training skilled workforce, supporting research and development etc. Clusters, industrial parks and business incubators are the link between territorial and sectorial development and some branches of activity in the smart specialization field are advantaged. These branches are: bio-economy, information and communication technology, space and security, energy, environment and climate change, Eco-nano-technologies and advanced materials, and health. Clusters, industrial parks and business incubators can really make the difference when it comes to creating the necessary environment for a proper functioning of horizontal and vertical collaboration, leading to the emergence and development of industries generating progress.

Keywords: territorial and sectorial development, competitiveness, the quaternary sector, clusters, industrial parks and business incubators.

1. Competitiveness - a premise for the development of smart specialization economic sectors

The National RDI Strategy 2014 – 2020 nominates the following categories as smart specialization areas: bio-economy, information and communication technology, space and security, energy, environment and climate change, Eco-nano-technologies and advanced materials and health. Underlining the importance of converging policies and public and private initiatives for the development of these areas, in order to identify the economic sectors with potential for smart specialization, the justification document of the National Competitiveness Strategy (SNC)[1]2014 – 2020 included three main criteria:

- **The structural dynamics of the economy** that placed new sectors in competitive positions (positions 1-3): Tourism and eco-tourism, Textiles and leather, Wood and furniture*;*
- **The dependence of the economy in terms of employment and added value of the traditional sectors with competitive advantages** (positions 4-6): Creative Industries, Automotive industry and components;
- **The increasing role of innovation and technological development in the integration of global value chains** (positions 7-10): Health and pharmaceutical products, energy and environmental management, Bio economics (agriculture, forestry, fisheries and aquaculture), biopharmaceutical and biotechnology.

The leading role is held by the projects creating competitiveness poles initiated in 2009 by the Ministry of Economy, Trade and Business Environment[2]. An environment that favours innovation and the creation of innovative jobs is generated by a constant dynamics of the entrepreneurship, together with the existence of potentially competitive sectors such as electrical and electronic equipment sector, automotive, the ICT sector, textiles and *clothing* industry, food, furniture, etc. and smart specialization such as bio-economy, information technologies and communications, energy and the environment, eco-technologies.

[1] The National Strategy for Competitiveness (SNC) is a strategic document of the Ministry of Economy, developed in consultation with both the private sector and the line ministries (especially the Ministry of Agriculture and Rural Development, Ministry of National Education and Research, Ministry of Regional Development and Public Administration) to correlate interventions for competitiveness, given the national fields of excellence, including in terms of territorial dimension and rural development.

[2] **Ministry of Economy, Trade and the Business Environment,** "Situation analysis on existing and potential competitiveness poles in Romania", 2011

On top of these there is the increasing share of start-ups active in the industry as well as the registration of the progress, lower for the moment, of the central government contribution in creating a sustainable entrepreneurial environment.

In the process of building a knowledge-based economy, with a reduced impact on the environment, increasingly higher funds are needed for R & D and technology transfer. In Romania, approximately 60% of the research expenditure is made by the state (unlike advanced economies where the private sector has a share of approx. 70%), and approximately 70%[3] of the total funding supports activities that do not exceed the stage of technological development, which contrasts with only 1% for marketing of RDI products and 2% for product development, which are the essence of innovation and initiative in business. The private sector also has a rather reduced contribution to innovation activities.

The government can support the private sector by expanding the hardware and software infrastructure, through education and training of a skilled workforce by supporting research and development etc. Therefore, a public funding of 1 % that could contribute to the increased demand of research in the private sector can be ensured; SMEs can be supported to launch innovative products or services through funds venture capital, grants, cooperation projects and entrepreneurship can be stimulated in the creative industries by creating incubators / cluster / accelerators and by supporting the development and start-ups in such fields. The fact that the authorities can stimulate the phenomenon of clustering not only through direct interventions, but also through indirect measures, such as regulating the operation of networks, supporting the integration of enterprises in clusters and RDI activities is a major benefit important[4].

2. Theoretical guidelines

Starting from two criteria, labour productivity and the introduction of technical progress, the quaternary sector is added to the sectoral grouping of national activities proposed by Jean Fourastie (primary sector - agriculture, fishing, forestry and mining; the secondary sector - industry, construction; tertiary sector). The quaternary sector includes the types of services with the highest degree of technical progress: research services, computer services, telecommunications, joining those in education, health and culture. Even with this additional sector, the area of services is much broader,

[3] The World Bank (2011) "Romania Functional Review. Research, Development, and Innovation Sector", Final Report, 31 May, p. 42

[4] Foreign investors in activities with high added value such as Renault, Continental and Bosch even if they found in Romania skills at relatively low cost, continue to cooperate closely with universities and to invest in training of their employees, expanding their research cluster beyond areas where are located.

being found in the first two sectors of the economy (transport, maintenance / repair in the manufacturing units, management services, for internal needs research, etc.) and their capacity for renewal. Therefore, there is an intertwining / interdependent relationship between the sectors. The tertiary sector, with its diverse and complex structure, is currently both a condition and a result of the technical progress. This sector is a branch of the world economy and enjoys the most dynamic development, which surpasses both primary and secondary sectors. Considering the fact that the services with an increased intelligence contribution (such as in education, scientific research, banking, IT, research and development, top management) generate technical progress and contribute decisively to the economic growth, the tertiary sector and the quaternary service, detached from the former, tend to occupy the central place in advanced economies, registering a migration towards these sectors with a significant increase of employees. The link between services and production is made by high technology contained in the quaternary sector. Having an important role in the development of innovative sectors, clusters, industrial parks and business incubators are true engines of economic growth and employment.

3. Industrial parks, business incubators and clusters in the Romanian sectoral context

Unlike industry and agriculture, the development and placement of the services provided by the quaternary sector depend primarily on the location, the number, the financial resources, the ability to communicate of consumers (population, businesses, etc.) and secondarily on the availability of raw materials / labour force. Thus, the link between the sectoral and the territorial development is mainly done through clusters, industrial parks and business incubators[5]. We have encountered constraints in obtaining updated information on the number and the areas of activity of industrial parks, clusters and incubators, as there is no unified database at the country / regions / districts level to outline a picture of them in the Romanian sectoral context.

"Incubators" and "clusters" are new concepts, especially from the legal point of view, for most Romanian entrepreneurs, but their awareness is growing. There are two types of incubators: those operating in industrial parks and those functioning as business centres, as in the case of smaller towns such as Sfântu Gheorghe, Dorohoi or Alba Iulia.

Business incubators and clusters interact on multiple levels. For example, six clusters were generated within the business incubator in Sfântu Gheorghe town. Cluster management takes place within the business incubator. Thus, in every region

[5] The representatives of the Association of Business Incubators and Centers in Romania (AICAR), the Cluster Association in Romania (CLUSTERO) and the Association of Industrial Parks (APITSIAR) signed a partnership agreement since 2012.

where there are business incubators, promoting clusters is imposed by it and this breathes new life into the economy. Through business incubators, a local company[6] can be enhanced and through clusters, it can be promoted at national and international levels[7]. Aware of this interdependence, since 2012, representatives of the Association of Business Incubators and Centres in Romania (AICAR), Cluster Association in Romania (CLUSTERO) and the Association of Industrial Parks (APITSIAR) signed a partnership agreement.

The importance of developing business incubators that are supporting the entrepreneurs has begun gaining awareness not long ago. At the end of 2015 the most famous Romanian business incubators were: The Program "Incubators in the Department for Small and medium business environment and tourism"; ”Incubated - the Business Incubators and Technology Project”, part of the multiannual national program to establish and develop technology and business incubators in Romania[8]; ”ASE start-up - Business Incubator of the Academy of Economic Studies”; ”Gemini Foundry Solutions - IT development and consulting business”; ”CREICA – Incubator” in the Innovation Park in Cluj, a regional business dedicated to companies working in the creative industries.

Of the eight types of business incubators that can be established according to Law no. 102/2016, we present those that we have identified as potentially having most elements of innovation:

- Technology business incubator: SMEs with potential technological growth;
- Academic business incubator: SMEs with activity consisting in applying / using the results of research and development activity from an university / research institutes or develop the entrepreneurial initiative from academia, aiming at keeping young people in the community and the commercialization of technologies developed by students and university;
- Social business Incubator: uses entrepreneurship and innovation to create a social impact.

[6] For example, in Hungary and Austria there are incubators that are exclusively centers of clusters.

[7] Cauea C., 15 Mai 2013, "The business incubators will bring new life to the national economy" http://www.business24.ro/start-up/infiintare-firma/interviu-incubatoarele-de-afaceri-vor-aduce-un-suflu-nou-economiei-la-nivel-national-1528775

[8] It is an initiative coordinated by the Agency for Implementation of Projects and Programs for SMEs (AIPPIMM) and implemented by United Nations Development Programme (UNDP) in collaboration with Local and Regional Authorities

The 70 industrial parks with the title given by the Order of the Minister and Government Decision operating since 12.02. 2016[9] are not uniformly distributed at the county level. From a total of 41 counties, 14 counties do not have on their territory any industrial park, namely: Brăila, Buzău, Caraş-Severin, Călăraşi, Covasna, Harghita, Ilfov, Maramureş, Mehedinţi, Suceava, Teleorman, Tulcea, Vaslui and Vrancea. The counties with the largest industrial parks are (in descending order): Prahova (14), Brasov (10), Cluj (9), and Dâmboviţa (4). We mention 12 industrial parks are currently being developed in the counties of Galaţi, Braşov, Bistriţa-Năsăud, Cluj-Napoca (3), Vâlcea (2), Olt, Timiş, Mureş, Dolj and Bihor.

The distribution of operational industrial parks on the same date, according to the development regions is not uniform, either. Thus, South-Muntenia region has the most industrial parks, 22, and the fewest, two industrial parks, are in the South East region, as much as in the smaller region Bucharest-Ilfov. The following regions are in descending order: Centre with 16 industrial parks, Northwest with 15 industrial parks, Southwest with 6 industrial parks, and Northeast with 4 industrial parks and West with 3 industrial parks.

Regarding the number of science and technology parks (PST) authorized[10], the most recent list is from March 2012[11] and includes only four PST: PST Iaşi-Tehnopolis, PST Timişoara - TIM Science Park, Micro Nano Technologies PST, and PST Galaţi - Software Park Galaţi. Among the new technological and business incubators currently operating as accredited unities and temporarily authorised for a period of five years, within the innovation and technology transfer, according National Authority for Scientific Research of the Ministry of Education and Scientific Research, four are located in Bucharest. The cities of Sfântul Gheorghe, Craiova, Râmnicu Vâlcea and Braşov host five other technology and business incubators. Without legal form, they work within research institutes and universities, with one exception. This exception is the technology and business incubator functioning at IPA SA Bucharest, with its headquarter at Craiova. The temporary authorization for a

[9] Ministry of Regional Development and Public Administration, General Directorate of Public Administration, http://www.dpfbl.mdrap.ro/documents/parcuri_industriale/Parcuri_industriale_cu_titlu_si_proiecte_de_infrastructura_Phare.pdf

[10] Minister of National Education and Scientific Research has the task, in addition to give the functioning authorization, monitoring and evaluation of activities in the science and technology parks. This activity is done every two years by the Commission for authorization, constituted at the level of state authority for research and development, based on the activity report drawn up by the park administrator and approved by members of the joint venture, and after a visit made by the Commission in the park location. Costs related to this visit are charged to the budget of the Authority.

[11] Minister of National Education and Scientific Research, National Authority for Scientific Research and Innovation, Technology Transfer and Infrastructure Department

period of five years expires in 2016 for five of them. The accredited fields of activity are varied and range from Technology and machinery for agriculture and food industry to Software and electronics; from Machine building, textile, automation, information and communication technologies to Chemistry, cryogenics, nuclear, ecology, tourism, mountain tourism; from Energy efficiency of industrial processes and systems of renewable energy to environmental protection, wood and biotechnologies, biomaterials.

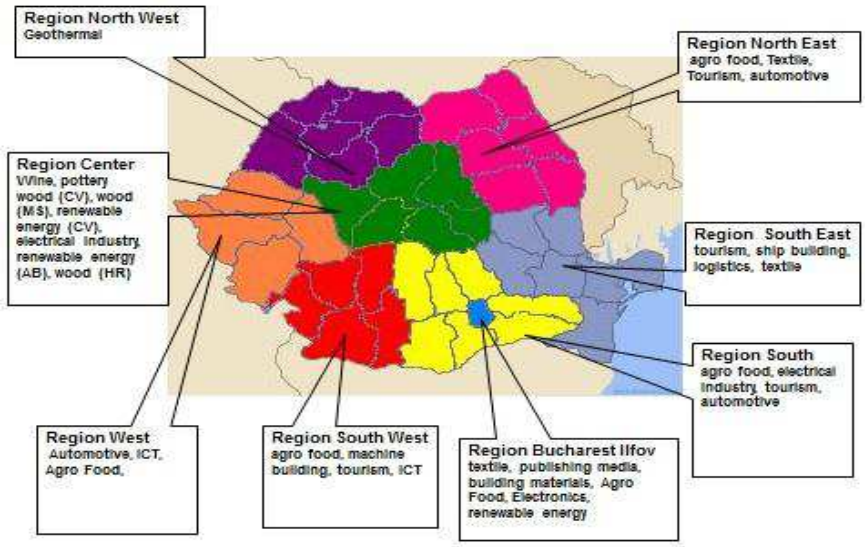
At EU level there is a tendency to unify the terms cluster (the Anglo-Saxon branch) and the pole of competitiveness (French branch)[12] with the innovative cluster. The qualitative analysis conducted in 2013 under the auspices of **Clustero.ro** [13], based on previous experience and on questionnaire-based interviews of relevant stakeholders[14], highlighted the following sectors as having a high potential for clustering: The automotive industry; The ICT industry; Agro-food sector; Logistics; Renewable energy; Textile industry; Wood and furniture industry. The Map no. 1 shows the distribution of clusters in Romania by region of development and by sectors of activity.

[12] The term "cluster" refers mostly to the industrial agglomerations and is focused on the concentration of businesses in the same field or related fields on employment, on specialization of the suppliers and regarding technology transfer and innovation. "Pole of Competitiveness" is an association of undertakings, research and development organizations and training, acting in partnership to implement a common development strategy. This strategy is built around innovative projects aimed to address one or more markets.

[13] Iorgulescu F., Coşniţă D. (2013) "The competitiveness of clusters in Romania" pp.10. ISBN: 978-973-0-15864-9; http://clustero.eu/wp-content/uploads/2011/11/analiza_competivitatii.pdf

[14] Autorităţi National authorities (Ministry of Economy, Trade and Business Environment, Ministry of Communications and Information Technology, National Authority for Scientific Research, Ministry of Regional Development and Tourism), regional (RDAs, county councils), local (municipalities); enterprises and branch associations; the academia (universities and research institutes), organizations with catalyst role (technology transfer centers, chambers of commerce, etc.).

The Map no. 1
The map of clusters / sectors of activity in Romania in 2013



Source: The competitiveness of clusters in Romania, Clustero.ro 11.2013, p.10, Editorial team: Daniel Coşniţă- Analysis Coordinator, Flavius Iorgulescu, ISBN: 978-973-0-15864-9

The abovementioned study revealed that the most active 17 clusters[15] were active especially in the sectors listed in Table. 1.

Tabel 1 The sectors of activity of the most active clusters

No.	**Sectors of activity**	Member Companies	No. of employees / association membership
1	**Machinery industry**	62 companies	34.180
2	**Electrotechnical industry**	61 companies	3.526
3	**Textile industry**	47 companies	5.260
4	**Energy**	45 companies	7.230

[15] both clusters members and non-member of the Cluster Association in Romania (CLUSTERO)

5	**Wood and furniture industry**	12 companies	407

Source: The competitiveness of clusters in Romania, Clustero.ro 11.2013, p.10, Editorial team: Daniel Coşniţă- Analysis Coordinator, Flavius Iorgulescu, ISBN: 978-973-0-15864-9 /The Romanian Statistical Yearbook, 2012 along with the data provided directly by clusters.

In Romania, clusters, meaning industrial agglomeration in certain geographic regions, were formed spontaneously "bottom up", relying on the tradition of the region concerned as the cluster of component suppliers for the automotive industry "Sprint ACAROM or Pol Muntenia Auto" and of the "Romanian Textile Concept", or on the localization of some multinational companies, such as the cluster "Automotivest". The intervention of a factor / institutions catalyst[16] led to the generation of clusters / potential competitiveness poles.

At the national level, by 2013, there were about 20-30 active clusters. Their number started to rise with the first European funding dedicated of clusters, reaching as at the end of January 2015, in the records of the Ministry of Economy - Department of Industrial Policy and Competitiveness to be 79 clusters and competitiveness poles[17], which we present below, grouped according to several particularities (as cluster Association in Romania, with 43 member clusters[18]):

[16] Among the institutions catalyst we mention ADR-uri (”Automotive Vest”), branch associations (”Romanian Textile Concept”) consulting firms (”Pro Wood”, ”Sprint ACAROM”). Of special importance was the 7th Framework Programme, based on which 4 poles of competitiveness were created (”Sprint ACAROM”, ”Automotive Vest”, ”Pro Wood”, ”Imago MOL”).

[17] http://www.altbrasov.org/ro/blog/alt-brasov-certificat-la-nivel-european

[18] AgroFood Crisana Banat, AGROFOOD Sfantu Gheorghe, Agro Transilvania Cluster, Asociatia Construct Cluster Oltenia, Auto Muntenia Competitiveness Pole, Automotive Sud Vest Oltenia Pole, AUTOMOTIVEST Regional cluster, Cluj IT, Cluster Mobilier Transilvan, Cluster Textil Astrico Nord Est, Cluster Traditions Manufacture Future TMV Sud Est, Clusterul Maritim Romanesc, Clusterul pentru Inovare si Tehnologie Brasov, Clusterul pentru Sanatate Dunarea de Jos, Clusterul PrelMet Transilvania, Clusterul Regional Balneoturistic „Transylvania”, Clusterul Regional Electrotehnic ETREC, Clusterul Regional Inovativ de Imagistica Moleculara si Structurala Nord-Est (IMAGO-MOL), Electrical Engineering Pole, ELINCLUS, Go Electric, Green energy biomass cluster, ICT – Regional Competitiveness Pole Oltenia Cluster, ICT Regional Cluster, Ind Agro Competitiveness Pole, IND AGRO VEST – Sviluppo Insieme si Vince, Innovativ Regional Cluster Packaging-Printing-Design, INOVTRANS, iTechSylvania, New Media Iasi, Polaris, PRO WOOD Regional Wood Cluster, REGIOFA Cluster, Regional Mechatronics Cluster – MECHATREC, Romanian River Transport, Romanian Textile Concept Cluster Bucharest, ROSENC CLUSTER, SIS-AUTOM-INT – POL, SPRINT ACAROM, Transylvania Textile&Fashion Cluster, TURINN Cluster, Turism Oltenia Cluster, Turism Regional Cluster

- 8 competitiveness poles were selected for financing under the O1.3.1 POS CCE "poles of competitiveness";
- 27 clusters were selected for funding in Operation 1.3.3 POS CCE "Clusters." All clusters follows the pattern of "four leaf clover" including industry, CDI units, public authorities and catalyst organizations;
- 30 clusters are members of the Clusters Association in Romania - CLUSTERO, a representative body at national and international level of clusters in Romania;;
- 13 clusters have won a bronze medal for excellence in cluster management following the benchmarking exercise conducted by the European Secretariat for Cluster Analysis (from the European Commission demand).

3.4. Conclusions

Unlike industry and agriculture, the development and placement of the services provided by the quaternary sector depend primarily on the location, the number, the financial resources, the ability to communicate of consumers (population, businesses, etc.) and secondarily on the availability of raw materials / labour force. Clusters, industrial parks and business incubators are the link between territorial and sectorial development and some branches in the smart specialization field are advantaged. These branches are: bio-economy, information and communication technology, space and security, energy, environment and climate change, Eco-nano-technologies and advanced materials, and health.

Clusters, industrial parks and business incubators can really make the difference when it comes to creating the necessary environment for a proper functioning of horizontal and vertical collaboration, leading to the emergence and development of industries generating progress. These instruments can bring clear advantages to the providers, the working force and the companies from a specific geographical area by stimulating innovation. This can be done by including scientific research and adapting higher education to the requirements of the companies, by creating networks of customers and suppliers and thus increasing efficiency, competitiveness and employment rate. For an economic and employment growth that are equally beneficial to the private environment, to the employees and the communities, innovation and stimulation policies of the economic sectors for smart specialization should be consistent with a clear, coherent legislation and an effective financing.

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