



THE ROLE OF THE UNIVERSITIES IN A REGIONAL INNOVATION SYSTEM – A COMPARATIVE A'WOT - ANALYSIS

(Rolul universităților în sistemul inovațional regional – analiza comparativă a'wot)

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Abstract

Universities have an important role in regional innovation systems. In this study, we evaluate and compare two different case regional innovation systems (RIS), one located in the north of Romania, in Bucovina area and the other in Ylä-Savo region, in the middle of Finland. Main focus is on how university is contributing to competences of a RIS. We use the A'WOT analysis, which is a hybrid method connecting Multiple Criteria Decision Support (MCDS) methods to SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis. The method yields analytical priorities for the factors included in SWOT analysis and makes them commensurable. The research work done was based on experts and actors interviews, which were structured according to principles of the steps of the A'WOT analysis. SMART technique was applied in the A'WOT framework.

Both case RIS are described and analysed. The main goal is to improve the theoretical and effective knowledge in the innovations and sustainable development field from a country with tradition: how management models are applied in countries with competitive industry; which are the costs of the marketing and management strategy implementation in companies; which are the obstacles for the entrepreneurs' development. The study will conclude by recommendations how to develop RIS competences, and especially the role of universities in this aspect.

Key words: ● innovation system ● multiple criteria decision support ● regional planning ● strategic planning ● SWOT

JEL Casification: O12, O31, L25, R11

Introduction

Starting with Lisbon Strategy, the European Union launched for the period 2007 – 2013 a set of initiatives that regards the research and innovation, the global competitiveness of the universities and research institutes, entrepreneurial abilities development and knowledge transfer in products and services.

The innovation are engines for economic growth, competitiveness, income creation & firm profit, employment creation, esp. in rural areas, changes towards environmental improvement and sustainable development and also meeting changing consumer needs & demographics. This paper discusses about regional innovation concepts and especially about the roles of universities in there.

Rezumat

Universitățile au un rol important în sistemul inovațional regional. În acest studiu vom evalua și compara două sisteme inovaționale regionale diferite (RIS), una localizată în nordul României, în zona Bucovina și cealaltă în regiunea Ylä-Savo, în mijlocul Finlandei. Cel mai important aspect este cum contribuie universitățile la competențele sistemului RIS. Am utilizat analiza A'WOT, care este o metoda hibridă, ce utilizează metoda MCDS – suport de decizie al criteriului multiplu și metoda analizei SWOT (punte tari, puncte slabe, oportunități și amenințări). Metoda se bazează pe analiza priorităților factorilor din analiza SWOT și îi face comensurabili. Cercetarea se bazează pe interviuri cu experți și agenți economici, iar rezultatele au fost structurate în acord cu principiile și pașii analizei A'WOT. În cadrul analizei A'WOT a fost utilizată tehnica SMART.

Au fost descrise și analizate ambele cazuri RIS (Regional Innovation System). Scopul este să îmbunătățim teoriile și cunoștințele efective despre inovare și dezvoltare durabilă dintr-o țară cu tradiție, în care sunt aplicate modele de management, cu industrie competitivă, țară care are implementată în cadrul companiei strategia de marketing și de management, pentru a cunoaște care sunt obstacolele pentru dezvoltarea antreprenorială. Studiul se finalizează cu recomandarea cum pot fi dezvoltate competențele RIS și în special rolul universităților în acest sistem.

Cuvinte cheie: ● sistem inovațional ● suport de decizie al criteriului multiplu ● planificare regională ● planificare strategică ● analiza SWOT

Clasificare JEL: O12, O31, L25, R11

In European Union next to the communitarian institutions, the national authorities and diverse international organizations/organisms (OECD, World Bank, WTO etc.) give more importance to the sector of education and is offering assistance in order to assure the quality of the educational processes for being a factor of human development, sustainable economical growth and social cohesion.

In European Union, each member state assumes the entire responsibility for the educational systems and for the content of educative programs, based on the subsidiary principle. The EU role is to contribute to the development of a qualitative education by encouraging the cooperation between member states and, if is necessary, by completing their actions for the porpoise of developing the European educational dimension, by favoring the mobility and by promoting the European cooperation between educational institutions.

A region is usually understood to those regions under administration of regional councils or as daily labour migration areas that are sub-regions. Administratively, politically and as daily spheres of work both, regions and sub-regions, are relevant and there are many institutions fostering their role, like media, education set-up and business development agencies. However, from the point of view of a firm, both are limited. Kautonen (2006) presents the key elements of the RIS approach on the firm level as follows (see figure nr. 1).

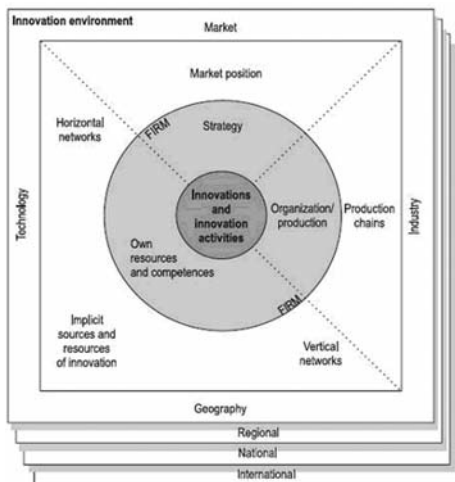


Figure nr 1. - The key elements of the RIS approach on the firm level (Kautonen 2006)

Figure presents the innovating firm surrounded by the four main elements of the general innovation environment: market, industry,

technology and geography, as seen from RIS approach. Beyond these are institutions that are focal the RIS approach, consisting of a wide range of formal and informal, created and emergent, and other type of institutions. The market and market position of a firm influences firm's innovation activities (market position, strategy). Firm's position in production chains also influences considerably its possibilities to innovate. To innovate, in addition to its internal resources and competences, a firm usually needs also external resources and competences (technology), usually acquired from its innovation environment via several channels: from market or production chains, new personnel from region, nation or from outboard, or by creating co-operative relationship (external innovation networks). And all these aspects have their geographical implications being in a certain spatial relation to the firm. Yet, RIS can be seen as unique for each firm, the same region may represent totally different kind of innovation environment for its firms (Kautonen 2006).

Objective of this study is to compare and analyse the competence and capability of how university can play in it's RIS. Two universities, one in Romania and one in Finland are used as a case studies, in which so called A'WOT analysis are carried out. Finally, results of the lessons learnt are compiled and some policy recommendations presented.

1. Case regions and analysing methods

● Case region 1. Suceava

Suceava County is situated in the Northern – Eastern part of Romania, at the Ukrainian border. Suceava County means 8553 km2, with slightly more than 700000 inhabitants living in the 16 towns of the county (43%) and in the surrounding rural areas (57%). Alone, Suceava town concentrates 120000 inhabitants. The number of employed persons is 250900, with a decreasing unemployment rate in the latest three years and situated today at 4.4%. Half of the population is employed in the primary sector – agriculture and forestry, other 18% in the industry and 13% in services. The main industries in Suceava County are the wood-based industries, the food stuffs industry, and the machinery producers. Most of industries are located around Suceava town, in an industrial park area. Although the tourism is not the main contributor to the local economy, Suceava region has an important tourism potential due to the forested

landscape, rural area traditions and mostly the centuries old, well known monasteries. Suceava County is recovering now for a more than a decade economic recession. In 2000, the Region North-Est from which Suceava is part was one of the poorest in the country.

Forests cover 51% of the county area. Forestry (sylviculture, without industry) contributed with less than 1.5% in the regional PIB, and provides 0.7% of the labour force. Forest industry provides jobs for around 2000 people. In October 2006, Egger Company has started its integrated wood factory that will provide up to 700 new jobs, and it is planned to be followed later one by a second factory established by the Austrian Holzindustrie Schweighofer. Both investments could lead to the creation of 4000 new jobs, e.g. the double compared with the present situation.

In the RIS, the main players are mostly governmental: the Agency for Regional Development North-East; the regional Chamber of Trade and Industries, the local public administration, the National Agency for Small and Medium Size Enterprises and Cooperation, the National Council of Small and Medium Size Enterprises, and Direction for agriculture and Rural Development. There is also a "business incubator" located in Suceava.

The research-development activities are dealt within five institutions: the Bank for Genetic Vegetal Resources, the Station for Research-Development in Agriculture, the station for Research on Norway spruce in Campulung Moldovenesc, and the Station for Research-Development for Fruit Trees Falticeni. The total number of researchers in Research-development activities in Suceava county was in 2004 of 511 people and the budget for research was 27.604 millions ROL (current prices).

The University Stefan cel Mare is a public institution educating in total 11300 students in nine faculties, with a number of 315 staff, teachers and researchers (2005). The main contributions of University in the RIS are to be located in 1) research activities, 2) educating skilled labor force for local industries, namely forest industry, food industry, machineries and equipment, 3) improving education and continuous education for practitioners, managers, namely in tourism-related issues, forest investment construction, 4) partnership with different institutions and firms in innovating and diffusion of innovation.

The problems of the University RIS-related used to be, for long time, the lack of

resources to carry research; too theoretical curricula, with little practical training for students; and finally, lack of interest to do research. The undergoing changes started in 2005 in the system of evaluating academic staff lead to an increased interest from teachers to do research.

● *Case region 2. Ylä-Savo*

Ylä-Savo region is located in central Finland as the northernmost part of province of North Savo. Ylä-Savo consists of the town of Iisalmi (21 000 inhabitants) and the surrounding rural districts, total area being about 9310 km². There are a total of 60 000 inhabitants in this region, number of employed persons being 23.000. Main problems of Ylä-Savo region are unemployment, the rate of which being 13 % and net emigration, being about 500 persons per year.

The main sources of livelihood come from services and food, wood and metal industry. The region has a powerful background based on dairy production with forestry as a supplementary source of income on the farms. The biggest employers are public services with 30 % share, agriculture and forestry with 19 % share and industry with 17 % share. Metal industry provides work for 1700 persons. Main companies, like PONSSE, producing forest machines, NORMET, producing mining and forest machines and WÄRTSILÄ, producing power plants for bioenergy, are closely connected to forest sector. Food stuffs industry provides work for 800 people, biggest companies being VALIO Lapinlahti (producing milk) and OLVI brewery.

Forest industry provides job for 1080 persons. In Ylä-Savo region is located three quite big sawmills, using nearly a million m³ logs all together. There are also three house factories in Ylä-Savo producing small houses for families and some companies producing furniture etc. LUNA WOOD is a company producing heat modified wood by applying a continuous process.

● *A'WOT – method*

The most important internal and external factors for the future of an enterprise are summarised within the SWOT analysis. In the A'WOT method (Kurttila et al., 2000; Kajanus et al., 2003), SWOT analysis is made more analytical by giving numerical rates to the SWOT factors as well as to the four SWOT groups. In the standard version, this is carried out by integrating the Analytic Hierarchy Process (AHP) (Saaty, 1980) and its eigenvalue calculation technique with SWOT analysis. The hybrid

method improves the quantitative information basis of strategic planning processes. The use of AHP with SWOT yields analytically-determined priorities for the factors included in SWOT analysis and makes them commensurable. In addition, decision alternatives can be evaluated with respect to each SWOT factor (Pesonen et al.,2001b). Thus, SWOT provides a basic frame within which to perform an analysis of the decision situation, and the AHP assists in carrying out SWOT more analytically and thoroughly so that alternative strategic decisions can be prioritised. Other decision support techniques can be applied for the same purpose in place of the AHP.

In this study, the AHP like pairwise comparisons and the eigenvalue calculation framework were replaced by the SimpleMulti-Attribute Rating Technique (SMART) method (Edwards,1971). SMART is based on the multiattribute utility theory (MAUT). Compared to the AHP,SMART is simpler to use, and makes comparisons of the importance of decision criteria and evaluations of the decision alternatives more straightforward. Therefore SMART is suitable for situations where, for example, there is a large number of criteria or decision alternatives and the persons defining the priorities are not able or willing to perform numerous and sometimes difficult pair wise comparisons. SMART techniques have been applied by Reynolds (2001), among others, in the area of natural resources. Different variations of SMART have been developed (see von Winterfeldt &

Edwards,1986). In fact, nowadays SMART consists of a family of different techniques and modifications. However, common to all SMART techniques is their reliance on direct numerical rating methods. In this study, the version of SMART used was the one where a fixed number of points (100) was allocated to decision elements compared at a particular time. For example,100 points were allocated to the SWOT factors within a SWOT group, to indicate the relative mutual importance of the factors.

The hybrid method A'WOT along with the SMART technique proceeds as follows:

- SWOT analysis is carried out. The relevant factors of the external and internal environment are identified and included in the SWOT analysis.

- The mutual importance of the SWOT factors are determined separately within each SWOT group. When the SMART method and its simple rating version are applied,the importance of the SWOT factors is defined as follows: 100 points are allocated for SWOT factors according their importance separately in each SWOT group.

- The mutual importance of the SWOT groups are determined. One hundred points are allocated to the four SWOT groups. Finally the individual SWOT factors within each SWOT group are scaled according to these priority values.

2. Analysis

SWOT for University Suceava

Table nr 1. - The SWOT analysis from Suceava region and the priorities of the SWOT factors and groups

SWOT Group	Factors	Range
Strengths	The tradition in teaching and research from more than 20 years	
	USV is a focal point in the local community	
	The USV staff is acknowledged for the research contribution on national and international level	
	The USV is officially acknowledged (authorisation obtained) and there is a concern for quality management in teaching	
	Good facilities for teaching and research	
	International relationship	
	Diversified educational supply	
	Low educational costs compared with the facilities offered to the students	
Weaknesses	Enough teachers, and good structure if analysed on the teachers' distribution by age and specialisation	
	The institution culture for quality of educational process	
	Low-motivating salaries for some teaching positions	
	Lack of teachers in some faculties and specialisations because of the little number of students and their low interest for studies	

SWOT Group	Factors	Range
Opportunities	Lack of finance for maintenance and development of infrastructure and facilities	
	Lack of communication with the local and national business milieu	
	Weak market-orientation of all academic structure regarding the recruitment of students, advertising, collection of the job offering, promoting the specialisations and faculties	
	Spending of time and effort more in favour of private activities and research mobility abroad than in the educational process	
	Insufficient preoccupation for developing the entrepreneurship in University	
	Staff over-burdened with administrative tasks and over-time work	
	Lack of group solidarity, and organisational attachment of teaching staff and students; danger of individualism and free-riding the institution for personal interest	
	The interest of the adult population for continuation of studies/ being specialised via Master programmes	
	The development of the trade due to the future localisation at the Eastern EU border	
	The forecast on decreasing inflation and decreasing cost of credits	
Threats	Encouraging new business in the region, e.g. agrotourism, valorisation of the cultural, spiritual and traditional heritage	
	Possibility to develop the business milieu as result of the implementation of the industrial parks and business incubator	
	Existing private educational structure	
	Deficitary demographic factor	
	The changes in the supply for graduating university degree, and the modification of centre of interest	
	The difficulty in the intellectual carrier – discouraging factor in obtaining a job during the studies	
	Centrifugal policies at the level of faculties and chairs that could lead to asymmetries	
	The migration of young staff to other sectors or institutions in the country of abroad	
	Impossibility to materialise the potential resulted from research	
	Decreasing the life-standards level is affecting the student conditions	
	The trend for obtaining a diploma versus creative accumulation of knowledge	

Three experts (one from the main town Iisalmi, one from the regional development company and one Savonia) were interviewed for the A'WOT analysis in a two-hour meeting. The most important SWOT factor in each SWOT group is in boldface.

Table nr 2. - The SWOT analysis from Ylä-Savo region and the priorities of the SWOT factors and groups

SWOT Group	Local priority	SWOT factors	Global priorities
Strengths	0,229	s1 - volume: 90 staff and 700 students (700/7000) totally in Kuopio	0,071685
		s2 - savonisa expertice related to needs in region (natural resources, health and social care,...)	0,035842
		s3 - good networking with networks of excellence outsided	0,064516
		s4 - close relations to region and enterprises	0,057348
Weaknesses	0,250	w1 - technological education only with adults	0,064516
		w2 - students could be more in enterprises while education	0,080645
		w3 - still small unit	0,064516
		w4 - no strong international education	0,040323
Opportunities	0,376	o1 -student and enterprises learning together	0,089606
		o2 - "mode2 research"	0,071685
		o3 - innovation workshop and laboratory concept	0,080645
		o4 - innovation university network	0,071685
		o5 - international co-operation	0,062724
Threats	0,144	t1 - High education policy turns around	0,031362
		t2 - development of Savonia don't relate to development of enterprises	0,050179
		t3 - not enough students	0,062724

Conclusions

The Awot analysis was done in the Romanian case on the basis of the formal Swot analysis of the University „Stefan cel Mare“ Suceava. The Swot analysis, taken from the 2005 annual University report, was concluded with a large participation of the teachers and researchers.

The Swot analysis revealed the general weakness of the Romanian education system and the particular strengths of the USV. The appearing of the factor „the difficulty of the intellectual career prevent students from working during the studies“ as the most important threat is surprising. It may appear as a reflexion of a missing factor - the fact that the students are not concluding work contracts during the studies, which would have helped them to be better prepared and more in contact with the economic practices.

The University role in the RIS is hampered by the little presence of innovation concept and idea in the daily life. In the actors' discourses, the innovation is perceived

mostly as being related with invention. The public policies in the innovation field are not strongly enough to alter this perception. It is significant that during the interviews the aim of the study has to be reworded as being the study of the role of the University in the regional economic development system, not on the regional innovation system.

The European Union gives a main role to the research, development and innovation domain (RDI) for consolidation of the competitiveness and for the economical growth; this domain will be called synthetically Research and Development (R&D). Changes occurred in technology and society demands introduce changes in traditional higher education, quality being seen as a knowledge generation in academia nowadays.

The European Council from Barcelona (March 2002) has underlined the fact that the education represents the base of the European social model and the education systems from Europe have to become “world benchmarks of quality” until 2010.

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