The Emplacement of Universities and their influence on the Development of the Old Industry Regions

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Abstract

The article includes evaluation of position universities in the old industry regions. With exploration of the Knowledge economy has increased the interest about evaluation of the position universities in the old industry region. The universities are specialized on the evolution of knowledge for national and global economy. Into this process comes regional dimension and orientation of the universities to regional and local articles, whereby national let us say international perspectives assimilate into complementary in relation to regional whether local perspective. The universities support innovation in regional enterprise medium by means of transfer research into the enterprise zone, commercialization of academic research and by supply of regional development. The universities have also important emplacement in the area of forming the human capital. The universities with their education generate capacities, that not only absorb know-how but also markedly contribute to generation of the new knowledge, charters and innovation methods. Specialized and educated work force promote with development of region in the particular areas in compliance with fundamentals of sustainable development.

Key words: universities, knowledge economy, old industry regions, transfer research, transfer of technology, education

JEL classification: O3, O32

1 Introduction

Relations among the acting participants belong to the important factors influencing competitiveness of regions. Institutions of state administration and local government, universities, corporations, and nongovernmental organizations belong to the main bodies represented within regions whose activity significantly influences regional development. Etzkowitz and Leydesdorff (1997) described the Triple helix model as a model of transformation process in the relationship among universities, industry, and public administration. The potential and determinateness of regions influence the quality and quantity of relations of the participants acting therein. Birch K., MacKinnon D., Cumbers A. (2008) compare economic characteristics of the economic center regions in Western Europe on the basis of Eurostat data. That results in the increased tasks of national variants of capitalism for formation of regional lines and different mechanism of regional application of aid to countries. Sandler (2004) describes the transformation of development of economic centre regions with steel industry and supplier chain through the development of clusters. The report from the executed research responds to the dissolution of steel industry in North East England. The survey was monitoring the outcome of decreased and changed steel regional deliveries. The changes of delivery steel industry were interpreted into requirements of an industrial cluster. In order to prove the effective regional

cluster policy it is necessary to identify clusters and number of variables, including the development graph, and the duty to distinguish importance of the dynamic cluster evaluation. The paper aims to assess the status of universities within the old industry regions as originators of new knowledge, patents, innovative procedures, and intended transfer of technology into industry.

2 Universities within the Old Industry Regions

2. 1 Status of Universities within the Old Industry Regions

Several studies related to assessment of impact of universities on the region (Felsenstein, 1996, Benneworth, Charles, 2004, Benneworth, Hospers, 2007) proved increased interest in the investigation of the knowledge economics and the status of universities within the economic development of regions. The regional development is influenced by natural wealth, constructed infrastructure, business environment, and especially educated workforce. According to the OECD (2007), availability of all forms of education with the support of life education is important for regional competitiveness. Universities perform several roles within the regional development. The fundamental roles of universities include education and research activity supplemented by development and formation of innovations, expert activity, as well as building of regional networks. Rehák (2005) distinguishes two influences of universities on the region: backward relations and forward relations. The author considers the backward relations to be the effects related to the expenses of staff, university students, and the university itself on households, public administration, and corporations in the form of a change of their employment and income. The forward relations are changes in the basis of knowledge, the level of human capital, and local attractiveness for entrepreneurs. The foregoing changes come up through university graduates and common research activities with corporations within the region. The regions integrate educational activities into regional development strategies mainly because universities attract investments, new enterprises are generated (spin off), local enterprises are supported, and the level of education of human capital is increased through life education. Tödtling F., Trippl M. (2005) distinguish problematic region types according to three dimensions: metropolitan regions (fragmented of innovative system), economic centre regions – old industrial regions (stuck in the region), and peripheral regions (organization deficiency).

The old industry regions are characterized by the following features:

- significant tendency to form clusters leads to greater specialization of traditional fields in the region,
- overall support of diversification and modernization of existing companies and preparation of conditions for the formation of new enterprises,
- development of the economic centre regions is strategically focused on breaking the dependence on traditional fields and supporting the revitalization of regional economics,
- innovation policy based on strengthening the transition to new fields and stimulation of innovative processes and products for new markets.

From the point of view of formation and application of knowledge bases, the old industry regions are based on synthetic knowledge basis in comparison to analytical and symbolic knowledge basis (Asheim et al, 2007). The synthetic knowledge basis is typical for application and

combination of existing knowledge by a new method, know-how from problem shooting, inductions, and made-to-order production.

2.2 Impact of Universities on Regional Development

Universities specialize in development of new knowledge in sciences whose existing knowledge is subject of a university education process. Universities support innovations and perform their regional dimension through concentration on sectors and enterprises acting in the region. The support of developmental activities within regions by the EU and the state is concentrated on the support of innovations, research, and increase of competitiveness of producers and suppliers. The reason for such trend lies in the concentration of the EU policy of subsidies, the Seventh Framework Program, and the programs supported by the Slovak government. We may observe in the economic centre regions that the national prospects become complementary and not substitution in relation to the regional and local prospect. We rank the following to the regulated forms of interactions of universities and enterprises (EK, 2002):

- regional cluster represented by the concentration of independent enterprises within one or more fields practically implementing the research results,
- regional innovative network is formed on the basis of cooperation among universities and enterprises within the region aiming at innovation development,
- regional innovative system is formed by closer cooperation among universities, research institutions, and enterprises forming innovative procedures and processes in the region.

The Centre of Research and Innovation of Automation Technology and Robotics is an example of a new partnership and interconnection formed in the economic centre region where we rank the local government of Košice. The Centre is formed by: Technical University of Košice with its Faculty of Mechanical Engineering (TUKE SjF) and Faculty of Electrical Engineering and Informatics (TUKE FEI), Research and Development Institute of the Plant of Heavy Mechanical Engineering in Košice (VVÚ ZŤS KE), and SPINEA s.r.o., Prešov (SPINEA). The research and development subjects of the Centre come out of social activities of the members of Slovak Association of Automation Technology and Robotics (SAATAR) and strategic plans supported in the state and European programs of research and development. The main priorities of the Centre for the period of 2009-2015 include:

- multifunction compact accumulators with high dynamics and exact positioning,
- mobile and service robots,
- multiagent robotic and visual systems,
- progressive assembly systems and testing technology,
- training programs for designers, technologists, supervisors, and organizers of automated and robotized workplaces and lines,
- testing methods and devices, measuring, diagnostics of products, machines, and technologies,
- establishment of training centers:
    - specialized in the field of control and communication systems in the field of design and operation of adjustable systems, programming and diagnostics of complex automated production systems,
    - specialized in design, programming, and operation of machines, machine centers, and robotized workplaces.

The establishment of the Centre of Research and Innovation of Automation Technology and Robotics is followed by the Centre for Transfer of New Technologies and Innovations (CTTI) in the industry in Prešov. The main source for implementation of original research results shall be the direct link to the Technical University in Košice represented by the Faculty of Production Technologies in Prešov, as well as the link to the member base SAATAR. The transfer of research knowledge from European and Slovak university and research sites applied according to the conditions of industrial organizations in the economic centre region shall be combined with the training of professionals in the CTTI. The research knowledge transfer shall enable higher competitiveness of industrial partners and better assertion of the qualified workforce.
The need to concentrate the developing capacity of research, production, supplier and engineering activities has resulted into a proposal for establishment of the Cluster of Automation and Robotization (ATR cluster). The main objective of the cluster participants is to carry out more effectively and more dynamically own activities enabling to enter both the foreign and domestic market on a higher quality level. The ATR cluster shall represent a group with a high creative potential and competitive production and supplier activity. The basis of the group may be formed by the member base SAATAR representing the partner for the technological platform ManuFuture SK along with the Central European Institute of Technology (CEIT). The mutually coordinated activities of the ATR cluster include:

- common research and development activities of the Centre of Research and Innovation of Automation and Robotization,
- common projects of new technologies and innovations transfer,
- preparation of research and development projects for domestic and foreign grant programs, state and European support funds,
- common activities of training of specialists for automation and robotization in the training centre SAATAR and at the Technical University in Košice,
- coordination of activities in European technological platforms EUROP and ManFuture.

Pavol Jozef Šafarik University in Košice, Faculty of Science, executes in the year 2009 project Slovak XFEL Distant Point. Technological service workplace for future users of the European Research Centre XFEL GmbH (Murín,P.,2008). It will distantly interconnect within the project Slovak centres with the registered seat of the XFEL GmbH in Hamburg and it will participate in the development of the XFEL DAQ (DAQ – Data Acquisition System). It will prepare a project from EU structural funds in cooperation with the XFEL GmbH, on the basis of which it will start at the end of 2010 to build a laboratory of technological preparation of samples for XFEL and laboratory of measurement technology XFEL. Main outputs of the project will include documents with elaboration of strategic project of participation of Slovakia in the group XFEL DAQ, with technological proposal for workplace equipment for distance cooperation within XFEL DAQ activities and structure of human resources for execution of activities in the XFEL DAQ.
Institute of Physics of the Faculty of Science of the Pavol Jozef Šafarik University in Košice deals in its scientific researches with the process of transfer of technologies and its best application in practice. Čani, D. (2009) as the main project engineer of micro-electric systems of the VVÚ ZŤS KE has designed extraordinarily accurate drives for directing of hadrons ray in the LHC accelerator in CERN, Geneva. High reliability of the introduced robotic system for transfer and accurate positioning of cryomagnets (cylindrical objects sixteen meters long with weight of 34 tonnes) and responsible approach to the project execution have resulted in awarding the

golden plaque Golden Hadron for the VVÚ ZŤS KE as the best supplier of CERN within the field of machinery devices.
Universities and research organizations participate in the research and development of new patents that shall finds their application in the regional development. Efficiency of financial funds spent on the regional development is defined by the number of patent application per 1 mil EUR exhausted on research by a particular institution, by the number of patents guaranteed per 1 mil EUR. It is difficult to determine what level of patenting comprises the executive procedure for employment of public finances in respect of research work interconnected with industrial fields. The evaluation of the EU Member States in 2004 shows that 8 new Member States have requested more than 10 mil EUR of investment per 1 European patent. Universities cooperate with industrial enterprises in the process of patenting pursuant to the innovation model by Haywood (2004). The knowledge created at universities is transferred to industrial enterprises in various methods. The most important ones include cooperation at development of new patents, licenses, formation of new technologies, commercial application of research results, transfer through newly admitted graduates and scientists, as well as formation of spin-off enterprises. The foregoing methods of knowledge transfer represent independent activities without any framework control.

3 Conclusion

Universities support innovations within business environment by the transfer of research into industrial enterprises, commercialization of academic research, and support of the regional development. In the old industry region, where the local government of Košice belongs, we can show examples of support and good partnership in the Centre of Research and Innovation of Automation Technology and Robotics among TUKE SjF, TUKE FEI, VVÚ ZŤS KE, and SPINEA. The mentioned Centre is connected with the Centre for Transfer of New Technologies and Innovations in Prešov and the Cluster of Automation and Robotization that is being established. Universities and research organizations perform the following important roles in relation to enterprises: possibility of access to new knowledge of scientific research and development, participation in development of new patents, ability to attract potential investors and business entities from other regions in order to support development of a region in question, education of qualified workforce – graduates, and participation in formation of spin-off enterprises. Universities have an important role in the field of formation of human capital and life education. Through education, universities build capacities that not only absorb knowledge but also significantly contribute to formation of new knowledge, patents, and innovative procedures. The specialized and educated workforce helps to develop the old industry regions and apply principles of permanently sustainable development.

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