

KNOWLEDGE MANAGEMENT AND TECHNOLOGY TRANSFER. HOW TO PROMOTE THE INNOVATIONS (THE KEYS OF ITALY AND ROMANIA)

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Abstract. Paper examines the ways in which the results of research are transformed into innovation and its economic effects. This is also in correlation to the verdict of the European Council (Lisbon 2000) to invest 3.5% of GDP in research. With particular reference to Italy and Romania and in the absence of an automatic transfer of the results of public research in innovation (European paradox), authors dwell on ways deemed most appropriate and effective for enterprises and for public administration so that they can readily get profit from the results of public research and become increasingly competitive in the global market.

INTRODUCTION

As known, the Italian production system is structurally characterized by a predominant weight (such as number, turnover, value added and employees) of small and medium enterprises, as happens in several other EU countries, including Romania to which are added the effects of the situation inherited from the past regime that had prevented the emergence of high-tech business. It also known that the production specializations Italian and Romanian are relative predominantly to the mature industries do not correspondents generally to high-tech industries [1] [2].

Clearly these circumstances are the basis of the low level of technological innovation in these countries. Italy is certainly competitive in products of high fashion, in the design of large infrastructure, in precision engineering, in the wide range of products of the soft economy, but, for example:

- such as Romania, Italy is a consumer of products with high technological content that not produces, from mobile telephony to advanced instrumentation, from medical equipment to innovative substances for the pharmaceutical industry, to electronics industry etc.;
- Italy not more has large industry: siderurgy, chemistry, mechanics, etc. or important firms in telecommunications, in information technology, in biotechnology etc.

Given this reality, the cultural and strategic premises (necessary to create innovation from the inside of the manufacturing system) have failed in Italy, as in Romania.

Purpose of this paper is to point out the systems and ways to overcome the current situation and promote the national economy in order to have better competitive performance, respect to the other firms acting on the global market, including those of the emerging big countries.

Keywords: Promotion innovation, Technological-net; Technology-transfer.

COMPETITIVENESS AND INNOVATION

The history of economic development processes teach us that the competitiveness of production systems is not realized if we aren't acted promptly to pursuing the prerequisites for achieving the innovations of product, process, management, socio-territorial, etc., namely forefront research and adequate training. This is because the phenomenon of globalization favours the most advanced countries in terms of research and innovation and harms societies and economies (such as Italian and Romanian) than in years past, have paid little attention and so little invested in research and training, so they have difficult to sustain the competition of countries that were inspired in this strategic philosophy.

In fact, as many studies have shown, there is a strong correlation between scientific, technological and cultural leadership and economic leadership. Today key factors of the international development are represented especially by new technologies (information, biotechnology, home automation, etc.) and hence science, technology and innovation have become key factors in development. In the past years in Italy we have believed that the spread of the small businesses, that individually are not capable of dealing the research, was a factor conducive to supporting the development of the country (to remember the slogan "small is beautiful"), but the reality of the global market has put highlighted the limitations of this approach.

These small companies mitigate the employment problems of short to medium term, but are not able to sustain competitiveness in global markets where is operative the "law of competition continues" and where innovation is required.

In this regard it is considered useful to report the percentage values (2007) of investment in research compared to GDP: Sweden 3.60, Finland 3.47, Austria 2.56, Denmark 2.55, Germany 2.54, France 2.08, Belgium 1.87, United Kingdom 1.79, Nederland 1.70, Ireland 1.31, Spain 1.27, Portugal 1.18, Hungary 0.97, Lithuania 0.82, Latvia 0.59, Greece 0.57, Poland 0.57, Romania 0.53, Bulgaria 0.4 [3]. They show that while some countries such as Sweden and Finland which commit percentages close to 3.5% of GDP there are countries that invest in research values close to 0.5% as the Romania and Bulgaria. The percentage for Italy is the 1.1% of the GDP. It is equally low to counter the international competition

In recent European Commission reports on the progress of technology of the member countries [4] attesting that the countries that invest a modest percentage of GDP remain back in the technological development of other advanced countries, and they may to be got over also by the emerging countries (China, Korea, India etc.) which have well understood that it is useful and necessary to invest substantially in research and training, especially if directed towards high technology sectors.

In this context, arise these questions

- a) what is the role of universities (and in general of other public research institutes)?
- b) how companies can gain access to technologies they need?
- c) how to choose the technologies best suited to their needs and their prospects?
- and d) what is role that should be reserved to the government policy and of the local communities?

ACTIVITY OF VALORIZATION OF PUBLIC RESEARCH

By nearly three decades, internationally, universities are recognized as a major source of technology available to companies and Public Administration. In fact, with reference to the university, the United States have felt the need to regulate the issue related to patenting and to creation of technology transfer offices with the adoption, in 1980, of the Bayh Dole Act (or University and Small Business Patent Procedures Act) [4], which has greatly stimulated the collaborations of research University-Industry. And if before that date were patented only the results of applied research (as early as 1920) then the U.S. universities have also started to patent the results of more extensive research (*such as those related to life sciences, software etc.*) equipping of offices

specializing in the exploitation of research (*research partnerships, assistance to patenting, commercial exploitation, creation of spin-offs, etc.*).

In Europe, it is for Britain's initiative that universities have seen fit to strengthen partnerships with external actors to obtain new financial resources. As for Italy and Romania universities have begun to add to their traditional objectives (scientific research and training) the further objective of exploitation of research results and technology transfer in more recent times and with greater force from when is become evident the growing scarcity of financial resources, which has intensified in recent 2 years to cause international crisis.

However the universities must be and remain in first place institutions that perform research of long-term and base for providing training highly qualified. Indeed, it is necessary to affirm that universities can achieve their traditional and new purposes only if oriented to the independent research, of long-term and of base.

This idea is shared even more from when collaboration between industry and universities has been proposed during the meeting in Lisbon in 2000 (Europe must be "... the knowledge based economy the most competitive and dynamic world ... ") [5].

If the search results may not be subject to legal protection for the impossibility of achieving the patent, the Legislative Decree issued in Italy on 27 July 1999, Number 297 [6] (and its Decree of Ministry August 8, 2000, Number 593) makes possible, for the researchers interested (connoisseur of the industry concerned and sometimes of the same prospects of the market), to become entrepreneurs themselves.

As often happens, then the researchers-entrepreneurs require entry into the corporate team of other players (financiers, production companies, professionals, etc.), while the statutes of the universities of origin may allow, under specific conditions, the possibility of entry, which member, the same university from which the spin off it is derived..

In recent years the creation of spin-offs has become one of the major issues of the evolutionistic economic theories.

They are based on the report "knowledge-innovation".

For the interesting consequences of which the theme of enterprise creation is a carrier (evaluation of research, increase in employment, creation expertise and high value-added economic and high impact on the territories, etc..) has involved the academic community that has expanded the its purposes, adding to its traditional objectives (research and training) also the technology transfer, to encourage innovations in the production context (firms) and, in general, in that economic-social.

So while in Italy the Government has included among its strategic aims those to fund applied research, the technological competition and the employment opportunities in highly skilled, the Italian universities are organized it, with appropriate regulations and offices, to enhance ideas and the knowledge able to develop transferable property rights (patents etc.). This not only through the ordinary procedures for technology transfer (research contracts, consultancy and the like, patents and licensing), but also through the new instruments that the same law provides: precisely the firms spin – off

EUROPEAN PARADOX

In Italy, as in Romania, there is a quality of public research that, internationally, is considered very good. Some international indicators show that, for the same resources spent, the scientific productivity of public sector researchers sees this Country in an international good position.

In Europe, including Italy and Romania at the same time, however, is totally inadequate commitment to the implementation of the economic results of scientific research and technology. Therefore it is difficult to achieve an effective transfer of technology to the companies, and then to introduce the innovations needed to compete in the global market.

For small businesses considered in isolation is already difficult to understand and express the need of technology they need, so that huge are the difficulties to achieving the cooperation with universities. For these companies there is the problem of making available the novelty (patented and otherwise) of which they haven't knowledge or access. One tool for overcoming these problems is the "networking" (as may be the "industrial districts") that are useful in establishing formal relations and which for that reason, they lend themselves to become engines important of the processes of innovation.

The network would ultimately become the basis of consolidated knowledge and skills, but above all, intellectual infrastructure of a special relationship with potential suppliers and potential customers of the search results.

All this highlights the opportunity that next to financial instruments and financial initiatives and support, the actions of local authorities are characterized for a strong presence of services and projects to link universities and companies, creating a virtuous cycle, that is what goes under called "triple helix" (Etzkowitz, 1997) [8], which of course must be adapted to local situations.

The process of convergence, connected to the model of triple helix, results in an innovative activity based on the interaction of mutual academic and business systems, supported by the industrial policy of the government and of the local governments

Therefore, the 3 pillars of innovation (public research, governance and business), have a responsibility to act with perfect harmony to create an environment for continuous innovation.

Well the need to create a "infrastructure of mediation of knowledge" and boost innovation reflects the policy outlined and objectives set by the EU in Lisbon in 2000, for conquer the leadership for dynamism and competitiveness on the global markets [9].

Public research, in front of an expenditure growth compared with smaller resources, is willing to use the funds available for business and to finalize, then, its activities towards objectives of an industrial nature.

Compelled by the scarcity of its budgets, the University becomes an economic actor to all effects both to administer its patent portfolio, both in promoting spin-off in hi-tech sectors, and both in providing expertise in research contracts sponsored by the economic world.

Must also be observed that the same public funding for academic research, once free from finalization, will become increasingly tied to the fulfilment of socio-economic functions.

Academic world and that of the companies become undisputed protagonists of the political project outlined in Lisbon [10].

CONCLUSION

Below, briefly, are suggested some points which are thought can provide operational insights designed to encourage the dissemination of methodologies, organizational models and innovative technologies considered useful for the exaltation and exploitation of the productive vocations, national and local:

- implementation, at the national level, of an inter-ministerial coordinating office to which assign to it the task of integrated planning of the fundamental objectives and of the resources (both national both supplied by the EU) to medium long term, to organization of the policy and of the systems management, of link tracking and monitoring of outcomes;
- identification of major technology projects, based on extensive sectors and areas, to support the economy of the country, in direct connection with the projects and technology plans of Europe, and with the direct partnership of local authorities. This in order to enhance the territorial specificities and provide both the creation of a national network consisting of universities (and government agencies to research) and business, linked firmly to the European network of facilities engaged in research and development;

- the establishment of ad hoc measures for industrial research. (Exemption from payment of social charges for staff researcher, tax credit on the cost of business research, support for the creation of enterprises Hi Tech, etc.);
 - strengthening the public system of research and better prospects for career development of researchers most deserving;
 - adoption of an appropriate evaluation system capable of directing resources towards excellence;
 - need to build up networks and regional structures to enable companies both to gain access to financial and logistical resources made available by the EU and governments (national and local) both to be constantly connected with research facilities in the territory.
- The goal is to provide, on a continuing basis, expertise and highly skilled human resources needed to implement innovations in step with the times, which are assured that they can compete with dynamism, on the global market;
- opportunities to benefit and improve the experiences of "technology clusters", as an engine of innovation processes and of immaterial infrastructure of exchange of new knowledge and technology among potential suppliers and potential customers that operate in the same network structure;
 - Optimization of the structure of interface between research and industry and assessment of the importance of their activities in order to make best use of resources and expertise.

REFERENCES

- [1] CNEL, *Gruppo di lavoro Ricerca, Innovazione e Trasferimento Tecnologico*, CNEL Roma, 17 aprile 2007
- [2] Dragan I.M., Isaic-Maniu A., Some Characteristics of the New Enterprises and the profile of New Entrepreneurs, *Review of International Comparative Management* , 2009, 10, 4, 681-690.
- [3] EUROSTAT, *Eurostat-newrelase 127/2009*, Eurostat press office, Bruxelles, 8 September 2009.
- [4] USC, *Title 37: Patents, Trademarks, and Copyrights, Part 401 – Rights to inventions made by nonprofit organizations and small business firms under government grants, contracts, and cooperative agreements*, 2010, <http://ecfr.gpoaccess.gov>, 609-625
- [5] EIS, *European Innovation Scoreboard*, www.pubblicamministrazione.net, years: 2009 / 2008 / 2007 / 2006 / 2005.
- [6] Gazzetta Ufficiale della Repubblica Italiana, D. Lgs. 27.7.1999, n. 297 and its DM 8.8.2000, n. 593.
- [7] Dosi G., Lerena L., Sylos Labin M.. *Science-Technology-Industry Links and the "European Paradox": Some Notes on the Dynamics of Scientific and Technological Research in Europe*," Bureau d'Economie Théorique et Appliquée, PEGE Strasbourg, 2005-11, 1-48.
- [8] Etzkowitz H, Leydesdorff L., *Introduction: Universities in the global knowledge economy. In Universities and the global knowledge economy: A triple helix of university-industry-government relations*, ed. by Henry Etzkowitz & Loet Leydesdorff, London, 1-8, 1997
- [9] CONSIGLIO EUROPEO, *Conclusioni della Presidenza*, Lisbona 23 e 24 marzo, <http://www.consilium.europa.eu>, 2000
- [10] *Economic and Social Committee, ECO/267 (OSL), The Lisbon Strategy after 2010*, Brussels, November 4, 2009.