THE ROLE OF INNOVATION IN INCREASING EFFICIENCY AND COMPETITIVENESS OF ENTERPRISES

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Abstract
Currently, there are almost no sectors, functions or elements of the economy which are not affected by qualitative changes related to the conditions of information society. The pivot of this society is knowledge, learning, intellectual capital and innovation. Moreover, the emergence of different initiatives to encourage "innovative practices" are, indeed, a new vision of how best practices may increase and upgrade our societies. It is obvious that the emergence of new forms of economy and social organization require the adoption and assimilation of new economic standards, but also the tools and technologies able to capitalize on opportunities created by knowledge economy.
The main purpose of knowledge, learning, intellectual capital, innovation, research and development is the stimulation of operational, commercial and financial effectiveness and efficacy of companies. Its vision is: better and more, easier and faster, cheaper. Scientific research, innovation represents today the most important engine for the improvement of living conditions and, in general, the wealth of a society. It is equally true that a healthy economic, social and cultural development is not possible without a well structured learning system with high academic standards based on a vigorous scientific research. Research and development activity, aims for development or innovation of services, products and technologies, insuring an optimal compatibility between the outputs of planning these activities (objects, strategies, programs and budgets) and the outputs of planning business portfolios and business strategies, as the outputs of the operational planning of the research-development activity (projects and budgets).

Key words: research, development, efficiency, effectiveness, innovation

JEL classification: O14, O32, O47

1. Definition of innovation

Innovation is generally regarded as the main engine of economic growth in today's global economy. The aim is to introduce innovations in practice to obtain products with improved quality characteristics, quality services, newer and more efficient and cleaner (green) production processes, improved models of business management systems, modern management methods of human resources, etc. There are many reasons for businesses and organizations to innovate, including: market share, the conquest of new markets, improvement of product quality, expanding the range of products, replacing obsolete products, reducing environmental impact, profit etc. Innovation and creativity are processes that are interrelated, because finding a solution to problems that arise in the process of innovation requires creativity. Innovation projects are put into practice of commercial application of an invention; however, innovation is possible without prior invention.

The Explanatory Dictionary of Romanian language[1] states that: "Innovation is a process (the act of innovation) and innovation is the result of innovation process". There is also the opinion that "innovation" is both: a process and an outcome of this process (so it would be an active form and result), that there is a polysemy of the term. The National Institute of Statistics defines innovation as an activity which results in a product (good or service) new or significantly improved, or new or significantly improved process, a new method of marketing. This is based on the results of new technologies, technological development, new combinations of existing technology or the use of other knowledge acquired by the company. Innovation must be new for the enterprise, but it is originally developed by other companies.

Innovation activities are scientific, technological, organizational, financial and commercial actions, which all participate in the realization and implementation of innovations[2].

In his „Capitalism, Socialism and Democracy", Joseph Schumpeter[3] proposes a definition of technical and economic innovation in general: „Innovation means to produce or to produce something different". Innovation, as Schumpeter defined, is assumed to be one of five types of activities, namely:

- Creating a new product;
- Introduction of a new production method;
- Entering a new market (or creating a new market);
- Using a new raw material;
- A new organization of the company.

According to Edwin Mansfield[4], innovation is "the technological and commercial creativity, transfer of new ideas or new concept to the final stage of a new product or process accepted by the market".

A similar definition is found in the Frascati Manual[5] of OECD, as "innovation (scientific and technological) can be regarded as transforming an idea into a marketable product, new or improved, or an operational process in industry or in commerce, or a new social approach ".

Systematic innovation begins with the analysis of new opportunities for innovation sources, which, in the opinion of Peter Drucker, are internal and external to the company. As a company *internal sources of innovation* the following can be considered[6]:

- **Unexpected event:** Any unexpected commercial success of the company must operate in an opportunity for innovation by developing a new product versions or new product will be released as next generation.

- **Needs processes:** process improvements create new opportunities. For example, the invention of linotype allowed printing large quantities of newspapers, with high efficiency in media.

- **Changes in industry and market:** market demand and industry growth opportunities open to launch innovation processes.

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[1] Academia Română, Institutul de Lingvistică "Iorgu Iordan-Al.Rosetti"- *Dicționarul Explicativ al limbii Române*, Ediția a 2-a, rev., Editura Univers Enciplopedic Gold, București, 2009, p.510

[2] OSLO Manual - *Guidelines for collecting and interpreting innovation data*, 3rd ed, OECD/European Communities, 2005.

[3] Schumpeter, J.A.: *Capitalism, Socialism and Democracy*, George Allen & Unwin (Publishers) Ltd., USA, 1976, republished in Taylor & Francis e-Library, London, 2003, p. 132 - 133.

[4] Mansfield, E. : *Research and Innovation in the Modern Corporation*, citat de Regis Larue de Tournemine în *Strategies technologiques et procesus d'innovation*, Editura d'Organisation, 1991, p.87.

[5] Frascati Manual: *Proposed Standard practice for surveys research and experimental development*, OECD, 2002.

[6] Drucker, F., P.: *The Discipline of Innovation*, in Harvard Business Review (HBR), May-June, 1985 și Reprint în HBR, R0208F, August, 2002, p. 6.

External sources of innovation (in the social and intellectual field) are:

- **Demographic changes** such as age distribution, education, occupations, etc. are opportunities for innovative entrepreneurs.

- **Changes in perception.** Understanding customer perceptions of products is the key to exploit opportunities.

- **New knowledge** of the categories of inventions, patents, know-how etc. will bring new products or market opportunities. Managers must consider all these sources of new opportunities.

Joel Broustail and Frédéric Fréry[7] have proposed other important sources for innovation, such as suppliers and customers, technology transfer from one industry to another or between different industries, market demands. We should not ignore other sources and methods of collecting information and innovative ideas, such as competitors, the company's current staff (human capital), business partners, etc. information from the marketing department[8].

Researchers attached increasing importance to human economic dowry since the mid nineteenth century; this concern is translated into a rapid increase proposed for analysis and critical studies[9].

Views on the economic performance of human capabilities do not come, in part, from the so-called school of human capital but also in other areas of "science choices" such as for example physical capital[10]. Milton Friedman, notes that investments in human capital (expenditures made to yield similar physical capital) increases the productivity.

As usual capital, efficiency in the allocation of scarce resources comes from both: material and immaterial investments, made in order to obtain substantially improved quality and quantity effects. Finally, "education and training are the most important investments in human capital"[11].

Competitiveness expresses the ability of firms to maintain in a competition which takes place internally and / or internationally and to obtain economic benefits in terms of a specific business environment. A truly competitive company will provide goods and / or services or any similar high quality at a lower price than its competitors. It is not at all easy to find solutions to make attractive products (services) at lower prices. In many cases the answer to the problem stated is innovation.

Innovation is a complex process by which certain ideas are translated into practice generating changes in products and services offered by a company. The success of economic agents in the current global economic crisis is due to their innovative capacity and flexibility that they exhibit permanently, from the desire to obtain profits and gain competitive advantages against major competitors. The innovative capacity of economic agents implies the introduction of new products or improved by improving organizational and technological processes specific to each company and not least by improving distribution processes.

Innovation is the key to success in today's society because[12]:

- Small business owners, managers and shareholders of large companies are happy because by appealing to innovation they increase profitability;

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[7] Broustail J., Fréry,F.: *Le management strategique de l'innovation*, Paris, Dalloz, 1993, p. 230

[8] Verworn,B.ș.a.: *Innovationsmanagement in kleinen und mittleren Unternehmen*, Arbeitspapier Nr.7, TU Hamburg-Harburg, 2000.

[9] Becker, G. - *Capitalul uman, o analiză teoretică şi empirică cu referire specială la educaţie*, Bucureşti, Editura ALL, 1997, p.1

[10] Friedman, M., Friedman, R.: *Libertatea de a alege. O declarație personală*, Editura Publica, București, 2009, p. 48-49.

[11] Becker, G. : *Comportamentul uman – o abordare economică*, Bucuresti, Editura ALL, 1994, p.17

[12] http://www.perseus.ro/arhiv.php?ida=10, Inovarea in viitor, 29.03.2010.

- Consumers are happy because they can always benefit from new products and services;

- "Innovation" taught people that they should not fix something that is broken and it is better to buy a new product.

Although at first glance the three stated reasons do not seem to lead us to the idea that innovation is a risk to humanity, after a closer analysis we find that innovation is ultimately contributing to the further depletion of natural resources. So far innovation has given us solutions for a better and more comfortable life, but it has not offered solutions to ensure long term resources for a better life. Innovation is what prompted us to eat more and faster and to make the landfill planet growing by the day. Also, innovation is the one that has brought us the current crisis.

Some financial professionals have thought it is appropriate to make innovations in the field of financial products and like this it appeared money market (financial products) without coverage.

Even if now is a great demand for new and cheap products, consumers will have to focus on products more expensive but will probably have a much longer life cycle. Obviously a much longer life cycle will mean a much smaller number of products that go to landfill, which will mean a default resource protection.

Innovative ideas that will solve the previously stated requirements only technically but not that of attracting consumers to these products will not save us from impending resource crunch.

2. National System Analysis of Research, Development and Innovation (RDI) in Romania

Innovation is the main driver of economic competitiveness, especially in a highly competitive market as the European one. Statistics show large gaps between Romania and EU in the rates of innovation, but the objective for 2013 is the share of firms introducing innovative products and services closer to the EU average. Innovation is basically an outcome for which research can be one of the sources, along with other factors such as experience, communication, marketing, etc. The RDI Strategy supports the kind of innovation that includes a research component, aiming at complementarity with the Structural Funds allocated for innovation.

Survey results conducted by the National Institute of Statistics of Romania on innovation[13] shows that in 2008-2010, over one third of companies with market-oriented activities, have introduced or implemented products, processes, marketing methods or organizational methods, new or significantly improved. Over half of large enterprises have innovation activity. There is greater innovation in services than in industry.

During the three years 2008-2010, of all enterprises included in the scope of statistical survey[14], 30,8% were innovative enterprises, down 2,5 percentage points from 2006-2008. Among them, 13,8% were successful technology innovators, companies that have introduced or implemented new or improved products or processes.

[13] National Institute of Statistics Romania in the Press release No. 29 / 02.08.2012 on innovation in industry and services in 2008-2010.

[14] **Data source** is "Innovation Survey" (INOV), based on European survey "Community Innovation Survey" (CIS) used in all EU Member States, in accordance with European Council Regulation on innovation statistics nr.1450/2004. Data are collected every two years. Provisional results presented are based on European CIS 2010 questionnaire.
The survey is aimed at businesses with 10 or more employees throughout the industry and part of services (wholesale trade, transport and storage, information and communications, financial intermediation and insurance, architectural and engineering activities, technical testing and analysis). Businesses with 100 or more employees are surveyed exhaustively. Size class by number of employees are: 10-49 (small), 50-249 (medium), 250 and above (high). Statistical population was 10,469 enterprises.

Companies that have introduced new or significantly improved products only had a share of 2,4% (as you can see in table 1), while companies that have implemented new or significantly improved processes have had a share of 3,6%, while those who had both products as and new or significantly improved processes have been accounted for 7,8%. Share of companies reporting ongoing and/or abandoned innovations was only 0,5%.

Table 1 Share front of the total number of enterprises (%)

Categories of enterprises	**2006-2008**	**2008-2010**
Technological innovation enterprises [15]	19,7	14,3
Product innovators only	2,4	2,4
Process innovators only	6,6	3,6
Product and process innovators	10,3	7,8
Enterprises with innovation ongoing and / or abandoned	0,5	0,5

source: www.insse.ro

In 2008-2010, comparing with the previous period analyzed, 2006-2008, the share of product innovators only, remained unchanged 2,4%, the innovators of the process almost halved from 6,6% to 3,6 %, the same downward trend was recorded in the case where product and process innovators share decreased from 10,3% to 7,8%.

The share of innovative enterprises[16] varies by enterprise size class. Chart. 1 shows that from 1115 large companies a total of 629 have been innovative enterprises, respectively 56,4%, while from 4836 of medium-sized enterprises only 1,874 companies have innovated with a share of 38,8%, and from the 20,379 small enterprises only 5613 were innovative recording a share of 27,5%.

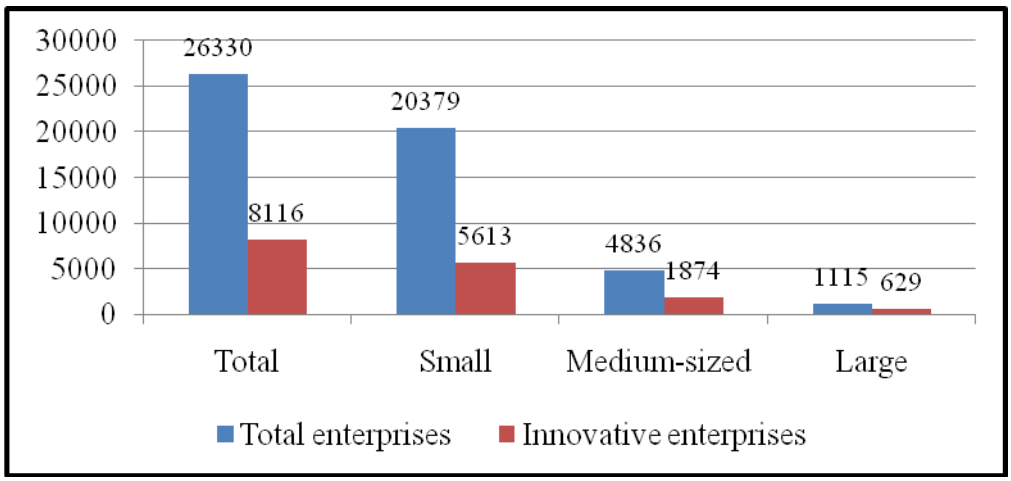

Chart. 1. Distribution of total number of enterprises and number of innovative enterprises, by size class, by number of employees

[15] Technological innovation enterprises are those businesses that have new products or processes or significantly improved.

[16] Innovative companies are active businesses that have launched products (goods or services) new or significantly improved products to market or introduced new or significantly improved processes and new methods of organization and marketing. The term refers to all types of innovators: product innovators, process innovators, organizational methods and methods of marketing and ongoing or abandoned innovation enterprises.

-Services sector more innovative than the industry

In the analyzed period, the share of innovative enterprises principally engaged in the manufacturing sector was 30,1%, while innovative enterprises with main activity in the service sector had a share of 31,7% exceeds industry by 1,6%.

- Non-technological innovators[17]

Non-technological innovators are those enterprises which in 2008-2010, have introduced in their companies new or significantly improved methods of organization and marketing. Innovation survey results in 2008-2010, shows that the share of firms that introduced new marketing methods by 0,8 percentage points than that of firms that have introduced new ways of organizing the enterprise. Non-technological innovators share was 14% in industry and 12,5% in services.

- More new products for the firm than new products to market

Of all companies, 13,4% had new or significantly improved products. Share of companies with new products only to company was 8,8%, while the share of enterprises with new products to market was 4,6%.

- Poor cooperation Romanian companies to innovate products and processes. Cooperation depends on company size.

Only 11,2% of all innovative enterprises have cooperation agreements with other commercial enterprises and institutions to achieve their innovative activities.

- Skills used by innovative companies

To carry out innovation companies need people with specific skills. These were self-employed person or persons co-opted from outside sources. In 2008-2010, the main skills used by businesses were: 35,6% market research, developing computer programs (software) 31,1% and graphic arts, layout and advertising 25,6%.; 15,8% of all innovative enterprises mentioned that creativity and new ideas was achieved through financial incentives.

3. RDI approach in the context of Europe 2020

For the results of the RDI system, the aggregate innovation indicator (Summary Innovation Index - SII, 2010)[18] which, for Romania has the value of 0.237 compared to 0.516 in the EU 27[19]. Important gaps are present in the share of employees in knowledge intensive activities:

- in total employed population in Romania 6,16%, compared with 13,03% in the EU 27;
- the share of exports of high and medium technological services in total exports, is close to the European average: 44,91% in Romania, compared to 49,43% in EU 27;
- the share of exports of high and medium technology products in total exports, is above the European average: 50.14% in Romania, compared to 47.36% in the EU 27.

Taking Europe 2020 objectives for Romania involves, first, catching up with the current average level reached in EU, for RDI investments. Romania is well below the European average, both in terms of RDI system capacity and of its performance with direct impact on economic competitiveness.

[17] Non-technological innovation enterprises are those enterprises that have introduced new or significantly improved methods of organization and marketing.

[18] *Innovation Union Scoreboard 2010*, IUS 2011 http://ec.europa.eu/enterprise/policies/innovation/facts-figuresanalysis/innovation-scoreboard/index_en.htm.

[19] **EU Member States 27 (joined):** Austria (1995), Belgium (1952), Bulgaria (2007), Cyprus (2004), Czech Republic (2004), Denmark (1973), Estonia (2004), Finland (1995) , France (1952), Germany (1952), Greece (1981), Hungary (2004), Ireland (1973), Italy (1952), Latvia (2004), Lithuania (2004), Luxembourg (1952), Malta (2004) Netherlands (1952), Poland (2004), Portugal (1986), Romania (2007), Slovakia (2004), Slovenia (2004), Spain (1986), Sweden (1995), UK (1973).

To achieve, in 2020, a level of 2% GDP for investment in public and private sectors (see table 2), we estimated the following trajectory for this indicator[20] (as shown in chart. 2):

Table 2 Investments in RDI, the public and private sectors

INDICATOR (%) GDP	**2009[21]**	**2011**	**2013**	**2015**	**2020**
Investments in RDI (public sources)	0.31	0.33	0.6	0.8	1
Investments in RDI (private sources)	0.17	0.15	0.25	0.5	1
Investments in RDI (public and private sources)	0.48	0.48	0.85	1.3	2

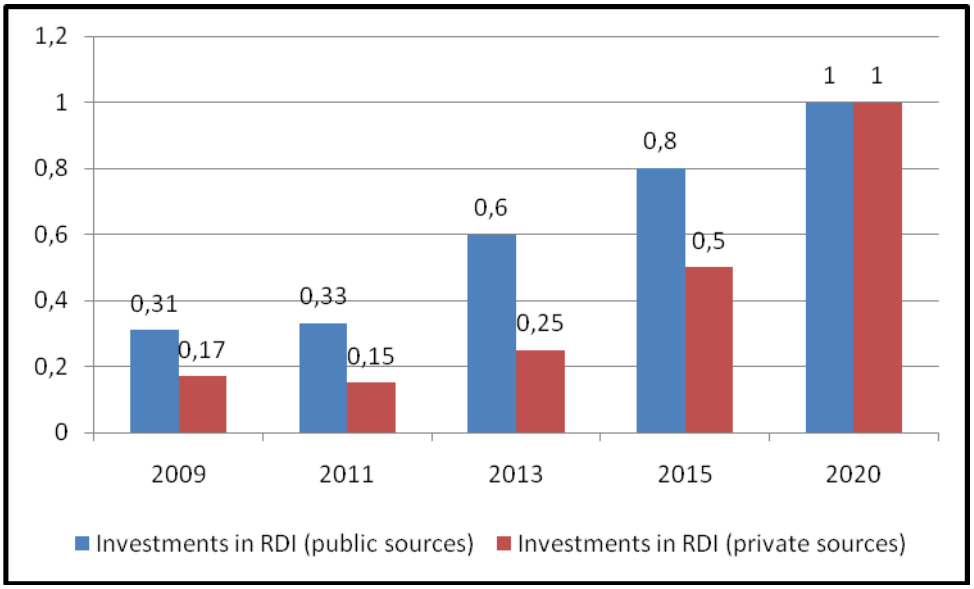

Chart. 2 Share of investment in RDI, in public and private sectors

According to the National Strategy for Research, Development and Innovation 2007-2013[22], at the heart of innovation support is co-precompetitive research projects initiated by companies, especially those which involve collaboration with universities and research institutes.

Innovation will be supported in the direction of transfer of research results that the transition from patents or know-how developed in complex projects, products and services. In this respect, we will support the creation and development of technology transfer entities, particularly public research institutes and universities.

An important innovation is the cooperation between firms, on the one hand and the cooperation between these firms and entities of RDI, on the other hand. As a result, we will encourage: innovative networks, participation in European Technology Platforms and development of national technological platforms in strategic areas. Investment in innovation infrastructure will be concentrated in the creation and development of scientific and technological parks, especially those who have the support of large companies or universities.

Public investment in innovation is, first, a drive element of private investment. To achieve growth during 2007-2013, private investment in RDI faster than public investment, fiscal incentives will be introduced, directed by tax cuts related projects in collaboration with universities and institutes. Implementation of these tools will be

[20] Estimates NASR (National Authority for Scientific Research).
[21] Romanian Statistical Yearbook 2010, NIS 2011.
[22] National Strategy for Research, Development and Innovation 2007-2013, Ministry of Education, National Authority for Scientific Research, December 2006.

based on and create mechanisms and tools that allow better underline private investment in scientific research and technological development.

4. Conclusions

Actors of economic and political „scenes" in Romania, if it was intended to lead the country to high levels of competitiveness and create highly skilled jobs, should decide a substantial increase in spending on research / innovation. The so-called ***"Japanese miracle"***[23] manifested in the aftermath of the Second World War is explained by the initial increase expenditure on education, which led to the existence of a much increased number of people better prepared to quickly assimilate technology news.

The fact that post-crisis world will enter a fierce competition on the field of competitiveness on the one hand and innovation and competitiveness in the EU report on the other hand, will call into question the imperative need to adapt education systems to innovation, encouraging industries and especially for operators to apply research results and invest in this sector.

John Maynard Keynes was the first great economist who said the state should employ their authority to levy taxes and spending to improve the economic crisis, as during a slowdown in economic activity, total demand for goods and services falls well below the level of supply, triggering unemployment and a decline in output, rising inflation[24]. To return to prosperity should be carried out on deficit spending, attracting investors, investment materials (in buildings, equipment, tools) and intangible (in strategy, organization, research and development, innovation, staff training, computer etc.).

Implementation of measures to develop capacity and to increase system performance of RDI, will enhance scientific and technological productivity and the quality level of research results. It is expected an increase in the number of articles published in prestigious journals, recognized in international classification systems and the number of patents valued internationally.

The proposed measures can also contribute to the development teams with internationally significant performance and thus the formation of critical mass that allows integration viable community partnerships and trans-national scientific and technical representative at European level and globally. For this course of action, in 2011-2013, financial resources are estimated worth (Euros): 2378 million (budget), 246 million (structural), 230 million (private sector).

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