Investments in research and development – case study in Eastern Europe

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Abstract. Over time there have been diverse and continuous evolution ways of financial and economic development at the nation level. Today, the world development level results from an ongoing investment, in various forms. The different ways to invest and measure the effectiveness of investments have been the subject of discussions since the beginning of economic science, reaching today as they hold great significance to leverage the dynamic development and economic growth, as the great inequalities, data asymmetry information, in the actual state. It is generally acknowledged the significant contribution of investment in research & development (R&D) on productivity growth as a major determinant of competitiveness and economic growth. So, the countries need to develop an absorptive or national learning capacity to attract investors in research & development field. In this paper we propose to consider first the role of investment in the creation of competitive advantage in the second part we present EU funded programs in R&D implemented in Romania and in the third part is the situation investments in during 2004 – 2011 in Eastern Europe through the use of specific indicators (public expenditure on R&D, business expenditure on R&D). Special attention will be given to analyzing the situation of Romania in the European context and to identify possible solutions to close the gaps that exist towards countries with optimal intensity of investments in R&D.

Keywords: investment, development, nation.

JEL Codes: E2, F3.

1. Introduction

Nation which measures growth prioritizes investments in research and development in order to gain competitive advantage. The relationship between R&D investments and creating value has been analyzed in the past. Most of the studies revealed that there were positive relationships between R&D investments and firm value. The evidence has shown that R&D investments create value for firms due to their competitive advantages for the firm when they are used as a differentiation strategy that creates new products or processes that are hard for competitors to imitate and that create brand equity [1] [4] [5] [10]. Investments in research and development are an important part in ensuring economic growth as a whole and for each country separately. These investments affect economic growth both through their contribution to volumes and improving their quality and other factors such as the transfer of modern technology and the improvement

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2. State-of-the-art on the investments in research and development

2.1. The concept of investments

For the definition of investment needed some clarification on the content and the term used in the expression. The concept of Western authors, the concept of investment has a narrow and one wide.

In a narrower sense, concept of investment is identified, usually with some expenses incurred to create or obtain goods (tangible or intangible), whose value is, in most cases, quite large, and their duration of use time [11]. In the broad sense, investment encompasses both costs concern instruments of labour and those for the purchase of raw materials, payment of wages, and for various banking transactions, i.e. all financial resources currently used in financing economic unit production [12].

The most common sense definition of expense or investment is placement in an initial amount of money to get later income. The investment effect an act that causes substantial economic growth in the future of the income where stems and change consumption and is subject to the dimension of savings and the use of inputs [7].

Often investments are considered as the most dynamic element of the economy; they are not only responsible for the cyclical fluctuations of the economy but is a factor of economic growth in the demand for capital goods and output. Although we not propose to presents a critical analysis of the interpretations given investment in these definitions consider, however, necessary to define clearly the concept of investment to the production costs. Provide money needed for the production of an undertaking is not synonymous with making investments in the enterprise. Even if presented initially as a cash expense, the investment cannot be divorced from the content material, it always turning items of capital investment, but it refers to the types of security and highlights the investment background, and anyway precedes the actual implementation of the project activity. Such in the literature, investments are considered as resources employed in the hope of achieving benefits over a long period of time or money or other resources spent in the hope that the future will receive larger amounts of money or will record other advantages [2].

In this definition clearly highlights the substantive content of investment (material resources, technical, labor, financial), the ultimate goal-making a profit and the character dynamic that is subject to time. Investing involves buying durable goods or means of employment that will be used in production (hence investment predate the production process ), which requires the renunciation of immediate consumption, argue in favor of additional monetary perspective could be get over a certain time, on account of asset invested. It is relevant in this respect, and appreciation made by Pierre Massé, investments that involve investments that involve waiving immediate consumption and common ground, which I can provide income and savings you have available now, for a future hopes whose support is really good for the investment, which is precisely fixed capital [9]. In Romania there may be confusing or incomplete interpretations of the concept of investment. The modern Romanian language dictionary defines investment as placing the allocation of a fund or capital while after Glossary of Romanian language the investment represents all
expenditures made and upgrade existing ones [6]. Between these two definitions are contradiction and even confusion. It may be noted in the first definition of the concept of investment confusing investment process where only now allocated the necessary funds effective execution of the works. Also, both definitions lack the dynamic nature of investment and final orientation, i.e. the aim of every investor a profit over a long period of time.

Synthesizing the mentioned considerations, defining investments must reveal that [13]:

• Is the placement of monetary funds into action in a project or operation to create an increase of wealth, both in the individual and the society
• Investment is a current effort which, every effort should be sized, planned and argued to be supported by those who have to make it
• Investment targets a better future to be revealed complex scientific and realistic and appropriate studies
• Source of investment financing constitute a waiver of current consumption possible and safe, in favor of future consumption, higher performing, but probable
• The aim is not only to achieve growth of goods and production capacities and durable, but again, a profit
• Represents a stream of values that have as initial startup, funds, part of the income and savings; transformation implies the existence of the necessary amounts of construction materials, equipment and technology that will be sheathed in future units and capabilities for manufacture and assembly etc.
• There is a gap in time between the time of investment and the delivery of results and expected revenues
• Expenditure incurred are currently arguing, in order to obtain future effects often uncertain; From this point of view is a resource investments that involve risk advanced;
• To produce, over time, further accumulation of fixed capital is required the normal functioning of the entire economic system

Investment in R&D is, in real terms, an investment in intangible assets that contribute to the growth of a firm in the long-term. Therefore, market capitalization of a firm reflects the current value of the intangible assets, as much as that of the tangible assets. Successful of the R&D investments results in a new product or service that enables the firm to distinguish from other firms [4].

2.2. Role of investments in research and development

On the role of investment in research and development in economic and social development, investments subject to enroll in all requirements are followed when the nation gained resources established destinations, it is established that the ratio of resources for development and the consumer. The influences of investment in research and development of the country is interpretable due to both the diversity of possible effects and potentiality of generating beneficial or negative depending on the existing concrete receiving economy.

Therefore, the following are the most important roles of investment in research and development:

• Support economic growth which is done differently depending on the form scope, representing a catalyst for economic development for all countries
• Their influence on the national economy is twofold. On the one hand has the role of macro-stabilization, on the other hand investments in research and development plays a key role in the restructuring and modernization of the national economy
• Considering the existing competition in the last decade in the international market it is necessary to invest in research and development to create more favourable conditions to achieve competitive advantage

3. National funded programs in R&D implemented in Romania

European grants making use of EU funds often relate to big projects with long lead times that involve large sums. Many of the projects development and improvement of universities, technical institutes, research institutes, companies and foundations are eligible for an EU grant. The most important national funding programs implemented in 2007-2013 in Romania are presented in Table 1.

Table 1: National funding programs for Research, Development & Innovation 2007 – 2013

<table>
<thead>
<tr>
<th>Program in R&amp;D</th>
<th>Objectives</th>
<th>Goal</th>
<th>Structure</th>
<th>Budget (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Resources</td>
<td>Promoting quality education and continuing training</td>
<td>Human resources to increase the number of researchers, improving their performance, attracting researchers in Romania living abroad and increasing the attractiveness of the research career</td>
<td>Axis 1: Education and training in support of growth of knowledge Axis 2: Linking lifelong learning and labor market Axis 3: Increasing adaptability of workers Axis 4 Modernising public employment service Axis 5: Promoting active employment measures Axis 6: Promoting social inclusion Axis 7: Technical assistance</td>
<td>4728 Euro</td>
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<td>Promoting entrepreneurial culture and improving quality at work</td>
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<td>Development of a modern labor markets</td>
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<td></td>
<td>Promoting labor market insertion of inactive people, Improving public employment services</td>
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<td>Ideas</td>
<td>Stimulation of the excellence and creativity in European research</td>
<td>Obtaining scientific and technological results, consistent with those of Europe reflected by increasing visibility and international recognition of Romanian research.</td>
<td>1. Exploratory research projects 2. Exploratory research complex projects 3. Exploratory workshops 4. School of advanced studies</td>
<td>7460 Euro</td>
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<td>Making Europe a pole of attraction of the best researchers Facilitate new scientific and technological progress</td>
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<tr>
<td>Partnerships</td>
<td>Increasing competitiveness by stimulating partnerships in R&amp;D</td>
<td>Creating conditions for better collaboration between different entities of research and development and</td>
<td>1. Information and Communications 2. Energy 3. Environment 4. Health 5. Agriculture and Food Security</td>
<td>32 365 Euro</td>
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<td></td>
<td>Identifying key social issues related to education and employment to develop</td>
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</table>
Increasing national competitiveness and creativity

Innovation

- Creating products and technologies to economic initiative
- Support services offer support for innovation
- Supporting the development of quality certification
- Supporting training and development of innovative networks

Increasing capacity for innovation, technological development and assimilation of research results in order to improve the competitiveness of the national economy and increase quality of life

Module 1 - Product development and systems
Module 2 - Creation and development entities to support innovation
Module 3 - Innovation Support Services
Module 4 - Infrastructure and Management

Capacities

- Participation in international research entities
- Implemented to enhance system efficiency and strengthening science-society relations
- National research capacity development and integration of R&D in Romania in international scientific environment

Module I - Development of public infrastructure Module II - Increase the efficiency and impact of R&D Module III - Funding for participation in international R&D Module IV - Support for Romania’s representation in bodies ST

4. The investments in research and development during 2004 – 2011 in Eastern Europe

The investments in research and development and their role in the stabilization and growth of the national economy international practice shows that in this situation the main factor to revive economic growth is providing a solid and permanent flow of capital. Given that capital accumulations in Romania in recent years have reached values determined, in the near future the most important investment remains in research and development (Table 2). In this context, the need for a comprehensive study of the investments in research and development by country is reasoned.

<table>
<thead>
<tr>
<th>Country</th>
<th>Indicators (Procent of GDP)</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Growth rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria</td>
<td>Public expenditure on R&amp;D</td>
<td>0.49</td>
<td>0.46</td>
<td>0.46</td>
<td>0.45</td>
<td>0.47</td>
<td>0.53</td>
<td>0.60</td>
<td>0.57</td>
<td>0.50</td>
<td>0.06</td>
<td>1.02</td>
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<tr>
<td>Country</td>
<td>Public expenditure on R&amp;D</td>
<td>Business expenditure on R&amp;D</td>
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<tr>
<td>Croatia</td>
<td>1.05</td>
<td>3.1</td>
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<tr>
<td>Czech Republic</td>
<td>1.20</td>
<td>3.8</td>
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<tr>
<td>Estonia</td>
<td>0.85</td>
<td>3.3</td>
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<tr>
<td>Hungary</td>
<td>0.88</td>
<td>2.9</td>
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<tr>
<td>Latvia</td>
<td>0.42</td>
<td>2.9</td>
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<tr>
<td>Lithuania</td>
<td>0.75</td>
<td>3.2</td>
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<tr>
<td>Moldova</td>
<td>0.35</td>
<td>2</td>
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<tr>
<td>Poland</td>
<td>0.56</td>
<td>3.1</td>
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<tr>
<td>Romania</td>
<td>0.39</td>
<td>0.34</td>
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5. Conclusions

Given that sustained and sustainable economic growth is possible only in conditions of a harmonious, in our opinion investing in research and development should be a real priority of the nation. In this regard, given the issues raised during the development work, we consider that the first step should be to target several main directions, namely:

- Significant increase in the absorption of EU funds and their efficient and effective, which is why we believe essential in realizing the opportunities that have arisen with this integration in the European Union
- Applying more effective EU policy on investments in research and development priority to the objectives of the beneficial effects long term, such as regional development, innovation activities and R & D, increasing the level of training of the workforce, supporting small and medium enterprises are the backbone of the Romanian economy
- Organizations more active involvement in research by developing concrete projects for economic development of the country and creating a win-win relationship.
In conclusion, in an era of knowledge countries that wants to gain competitive advantage need to invest in research and development.

6. Acknowledgements

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7. References


