

TAX INCENTIVE SCHEMES FOR R&D – A SOLUTION FOR THE ROMANIAN ECONOMY

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Abstract: *This study aims to examine what are the most efficient designs for a tax incentive scheme for Romania. We also investigated the relationship between the level of economic development and the R&D intensity in the European Union States. Our results suggest that the policy making authorities should focus on facilitating private investments in R&D, and especially on specific fiscal incentive schemes for SMEs. These schemes are important and efficient because they, by supporting enterprise's real needs, are not distorting the markets, thus facilitating and supporting R&D projects with very specific needs, with a more appropriate timing of the projects. After a complex description and analysis of ten examples of good practice in EU, we found out that an efficient scheme for R&D activities in Romania should focus on R&D expenses, containing both capital and current expenses, a benefit in form of an additional deduction for eligible R&D expenses, a flat rate system and size differentiation.*

Keywords: R&D, Tax incentives, SMEs, European Union, Knowledge-based economy

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1. Introduction

R&D activities are the main generators of knowledge and economic performance, thus becoming a stringent priority for the policy making authorities. The importance of R&D activities is also sustained by the trends and premises of the new economic paradigm (the knowledge-based economy), that relies on the increasing role of knowledge for competitiveness growth and economic development. An excellent working definition of this new approach points out *“that knowledge-based economy is characterized by the transformation of knowledge in raw material, capital, products, essential production factor for the economy, and by economic processes in which the generation, selling, acquisition, learning, stocking, developing, splitting and protection of the knowledge become predominant and decisive for long term profit gaining and sustainability assurance”* (Nicolescu, 2011).

Romania is involved in a complex process of convergence to the EU level, being way behind the average standard of living. In this context, the focus should approach the Romania’s capacity to generate higher growth rates comparative to the European average. As the new economy emerges, knowledge is becoming one of the main resources for future economic growth, thus, the research and experimental development – *“creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications”* (OECD, 2002) – becomes a key concern for the policy making authorities, both national and international.

This focus on R&D is expressed even by the EU 2020 Strategy. The main goal for Europe is to become a *“smart, sustainable and inclusive economy”*, proposing for this three priorities, five major objectives and seven flagship initiatives. Interestingly enough, two priorities (becoming a smart and sustainable economy), two objectives (R&D and climate change/energy) and three initiatives (Innovation Union, Resource efficient Europe, An industrial policy for the globalization era), are directly linked to R&D activities, this representing an outstanding argument in favor of R&D incentives schemes.

In this study we will investigate what are the most important characteristics of R&D tax incentive schemes, also trying to answer the question: *“what is the most efficient design of a tax incentive scheme for Romania?”*. The characteristics taken into account are the following: *the calculation basis for the tax credit, the type of eligible expenses, the type of tax credit, the dynamic of the tax credit rate, and size differentiation*. This

classification will represent an important tool in analyzing ten examples of R&D incentive schemes (from EU states), thus supporting the identification of the main tendencies at EU level.

2. Theoretical framework

The theoretical literature on R&D is highlighting the solid increase of R&D activities performed by networks as a result of collaboration (Kesavayuth, 2012). Actually, the amount of funds invested in R&D projects is positively correlated with the results translated into applicable innovations (Schwartz, 2012), this being a fundamental argument for the policy makers to focus on stimulating collaboration. This paradigm is also supported by authors that study the R&D evolution over time. Adopting a more theoretical approach in defining the stages and transformations that R&D went through, they conclude that *“the perspective on managing R&D processes has changed over the years, moving from a technology-centered model to a more interaction-focused view”* (Nobelius, 2004).

There are authors that examined the influences between the intensity of R&D activities and the corporate governance, the main findings being pretty intuitive, emphasizing that in order to *“enhance companies' innovation and R&D capabilities, they need to improve their corporate governance”* (Dong, 2010). Empirical studies also investigated the relationship between different management practices and the intensity of R&D activities in companies. As a result, here are some interesting findings: *“(1) the presence of CEO incentive schemes increases both corporate innovation effort and innovation performance; (2) sales-based performance measure in the incentive scheme, as compared with profit-based performance measure, is more conducive to firm innovation; and (3) CEO education level, professional background and political connection are positively associated with firm's innovation efforts”* (Lin, 2011). As there is a clear concern to identify the resources for R&D growth, the SMEs sector has been viewed as an “engine” for total R&D growth acceleration. In order to stimulate R&D in SMEs, there is a fundamental need of actions that address the management improvement and the encouragement of R&D cooperation (Martinez-Roman, 2011).

The theoretical preoccupation that *“public R&D subsidies crowd out private R&D investment”*, is countered by empirical studies that emphasize that *“funded firms are significantly more R&D active than non-funded*

firms” (Aerts, 2008). Another concern regarding the effectiveness of different R&D incentives focuses on the comparison of prizes and subsidies. The studies point out two main findings: “(1) prizes and subsidies provide complementary incentives; and (2) more subsidies are provided when the innovation process involves a higher level of difficulty” (Fu, 2012). As a result, one of the main possibilities to enhance R&D activities in enterprises, and especially in SMEs, is through governmental subsidies.

3. R&d activities in the European Union

3.1. R&D – a policy making issue

In the European Union there is a positive correlation (see Figure 1) between the R&D intensity (gross R&D expenses as percentage of GDP - GERD) and the level of economic development (GDP). As a result, the governmental authorities are both interested and constrained to take active measures in order to stimulate the R&D activities. In the context of the current economic crisis and the budgetary constraints, one of the most difficult decisions to make is what type of R&D must be supported first.

The structural approach should focus on: (1) the type of R&D activities (fundamental research, applied research and experimental development); (2) the sources of funds (government, enterprises, higher education, private non-profit and abroad); and (3) enterprise size (SMEs vs. Large enterprises). We will try to answer these questions in the lines below.

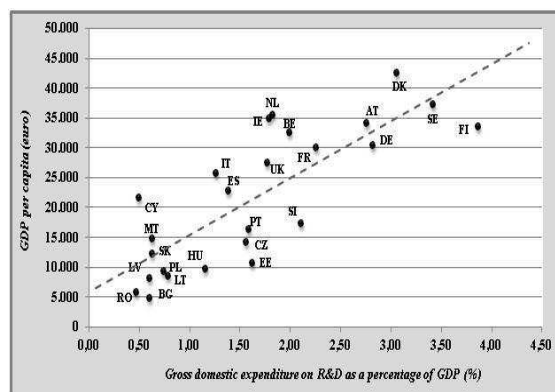


Figure no. 1. GDP per capita and GERD correlation in the European Union
Source: Eurostat data, own calculations.

Regarding the type of R&D activities, empirical data suggests that the more wealthier a county is (GDP per capita and R&D expenses), the more intense are the experimental development and applied research (see Figure 2). So, it is highly recommended to focus primarily on the activities that are generating added value more rapidly – experimental development and applied research.

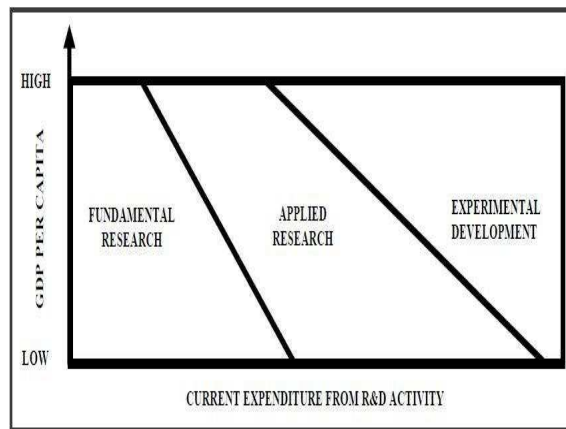


Figure 2. GDP per capita and the structure of R&D by type of research in the European Union

Source: Eurostat data, own calculations.

We can narrow the problematic area even more by analyzing the relationship between the source of funds for R&D and the propensity to invest in experimental development and applied research. Our results point out that the extra governmental sectors funds (enterprises, higher education, private non-profit and abroad) are more likely to do so, especially private enterprises. Also, as the participation of SMEs to total R&D expenses is modest, there is a large potential of growth concentrated in this sector. By facilitating the development of R&D in SMEs, the governmental authorities are actually accelerating the transition to the knowledge-based economy. So, from a policy making point of view, the focus should be on stimulating private investment in R&D, as these investment are generating more added value, thus sustaining the competitiveness growth and the economic development.

Stimulating R&D activities in SMEs

In order to stimulate efficiently the R&D activities, the governmental programs should address the needs of entrepreneurs through different channels. Incentives schemes can be classified as it follows:

A. *Providing direct support*, that can take the form of (a) fiscal stimulus like tax reliefs, or (b) grants, loans or innovation voucher schemes.

B. *Providing indirect support*, that consists in (a) financing research performed in universities, (b) financing the governmental research centers, and/or (c) stimulating management professionalization.

The EU's Seventh Framework Program for Research (FP7) implies a multiannual budget of aprox. 50 billion Euros for the 2007-2013 period, this being the largest European program that addresses R&D. Actually, FP7 is a tool that aims to support Europe's intentions regarding job creation, competitiveness and the consolidation of the knowledge-based economy. According to the subsidiary principle, every member state transposes the EU strategic thinking to the national level, in Romania this framework includes the *National Reform Program 2007-2013* and the *National Plan for Research, Development and Innovation 2007-2013*.

The programs targeting R&D, that are put in place by the public authorities, both at EU and national level, focus primarily on providing direct grants or subsidies for the eligible projects, and indirect support for R&D (financing research performed in universities and governmental research centers). In this context, it is important to emphasize the complementary characteristic of the tax credits for R&D. These fiscal facilities schemes are important because of the following arguments:

- a. *They don't distort the market*, since they address those projects that the free market already validated as feasible. As a result, tax credits stimulate the competitive R&D projects, thus prizing the winners.
- b. *They support enterprise's real needs*, as the R&D objectives are fully customized to the enterprise and market characteristics, and are aiming for a rapid and consistent economic exploitation.
- c. *They stimulate R&D projects with very specific needs*, that otherwise wouldn't have fit in the national schemes. So, the most innovative SMEs, that have the largest growth potential, are stimulated, even if they don't fit the classical R&D incentive schemes.
- d. *The timing of the project will be more appropriate*, as there a no deadlines, procedural steps and red tape imposed by the law. As a result, the R&D outcome is more likely to be favorable.

- e. *They can stimulate a larger number of enterprises, especially SMEs*, as the vision of such a scheme is following a portfolio approach over the R&D projects. So, thanks to the diversification brought in by the non-discriminatory design of the scheme, the results have a higher probability to generate real added value.
- f. *Less bureaucracy* in applying the scheme, thus a lower probability for corruption occurrence.
- g. *Low budgetary impact* comparative to the classical schemes (the impact is marginal), hence a higher efficiency of the measure.
- h. *These schemes are complementary* to the classical ones, their simultaneous implementation conducting to a more robust R&D system, that addresses better the needs of the enterprises, and especially SMEs.

Tax incentive schemes taxonomy

The European experience emphasizes that these types of schemes have been successfully implemented, and the results were more than satisfying. Although the principles are the same, the operationalisation process was different in various EU states, thus, for a better understanding, we provide the following taxonomy:

- I. By the calculation basis for the tax credit
 - a. *R&D results* – the tax credit is calculated by applying the rate to the amount of revenue obtained as a result of exploiting the R&D outcomes.
 - b. *R&D expenses* – the tax credit is calculated by applying the rate to the amount and structure of the eligible R&D expenses.
 - c. *Mixed* – a simultaneous use of the both types of previously described incentives.
- II. By the type of eligible expenses
 - a. *Capital expenses* – the tax credit is calculated by applying the rate to the amount capital expenses, thus to the investment component (both tangible and intangible).
 - b. *Current expenses* – the tax credit is calculated by applying the rate to the amount of current expenses, most frequently focusing on the personnel expenditure.
 - c. *Mixed* – a simultaneous use of the both types of previously described incentives (based on capital and current expenses).

III. By the type of tax credit

- a. *Additional deduction or exemption* – the benefit is the reduction of some payment obligations that an enterprise has to the state budget (ex.: corporate tax, social contributions, tax on buildings).
- b. *Cash reimbursement* – the benefit consists in cash reimbursement, thus influencing positively the real cash flow of the enterprise.
- c. *Mixed* – presupposes the existence of the option to choose whether to use the additional deduction, or to require a cash reimbursement.

IV. By the dynamic of the tax credit rate

- a. *Flat system* – consists in using a constant tax credit rate, regardless of the amount of the R&D expenses involved in the project.
- b. *Progressive system* – presupposes the use of a higher marginal tax credit rate for the surplus (according to a limit imposed by law, or to the level encountered in a previous period).
- c. *Regressive system* – presupposes the use of a lower marginal tax credit rate for the surplus (according to a limit imposed by law, the level encountered in a previous period).

V. By the beneficiary differentiation

- a. *No differentiation* – the same conditions are applied for all enterprises.
- b. *Differentiation by size* – consists in the use of higher incentives for SMEs.

EU best practices

At the beginning of 2012, we identified 10 EU states that were using fiscal incentives for R&D activities (Austria, Belgium, Czech Republic, France, Ireland, United Kingdom, Poland, Portugal, Spain and Hungary). In order to identify the relevant tendencies and characteristics that are specific for EU, we analyzed these 10 countries in the paradigm of the above presented taxonomy (see Table 1).

So, the calculation basis for the tax credit is most of the time linked just to the total amount of R&D expenses, but there are three exceptions with the mixed type: Belgium, Spain and Hungary. The mixed approach emphasizes that, although the amount of R&D expenses is a really good proxy for measuring the intensity of R&D, there is still a point in “injecting” some competition through prizeing the enterprises that already got to exploit economically the R&D output, thus generating revenue. Examining the type

of tax credit these states are using, the large majority rely on additional deductions or exemptions. This situation is pretty intuitive because such an incentive is the most fiscally neutral in terms of cash flow. Cash reimbursements are used in pure form in Austria, and in mixed combination in the United Kingdom. Going further with the classification, we observe that more than a half of the analyzed states is involving flat tax credit rates, i.e. using a constant tax credit rate, regardless of the amount of the R&D expenses involved in the project. Also, progressive marginal rates are operationalised in three states (Ireland, Portugal and Spain), France being the only one that is approaching the issues of R&D fiscal incentives in a regressive paradigm. The last criteria targets the approach regarding differentiation of the beneficiaries. Table 1 is highlighting that the use of higher incentives in the case of SMEs is characteristic only for the United Kingdom and Poland.

The above mentioned findings allow us to conclude that the average approach in Europe is characterized by the following elements: (a) the benefit is the same for both large enterprises and SMEs, and comes in the form of (b) additional deductions or exemptions, calculated by (c) applying a flat rate to (d) the total amount of eligible R&D expenses, targeting primarily the (e) investment component.

Table no. 1
European Union examples of tax credit schemes for R&D

	I	II	III	IV	V
AT	Exp.	Cap.	Cash	Flat	No diff.
BE	Mix.	Mix.	Ded.	Flat	No diff.
CZ	Exp.	Cap.	Ded.	Flat	No diff.
FR	Exp.	Cap.	Ded.	Reg.	No diff.
IE	Exp.	Cap.	Ded.	Prog.	No diff.
UK	Exp.	Mix.	Mix.	Flat	Diff.
PL	Exp.	Cap.	Ded.	Flat	Diff.
PT	Exp.	Mix.	Ded.	Prog.	No diff.
ES	Mix.	Mix.	Ded.	Prog.	No diff.
HU	Mix.	Mix.	Ded.	Flat	No diff.

Source: Romania's R&D activities in the of European Union context

In 2010, Romania's GERD was almost 4,3 times lower (0,47% of GDP) comparative to the EU average (2,00% of GDP). The gap widens even more if we consider the R&D expenses per capita, Romania scoring a

level 18,3 times lower than the EU average (26,7 euro per capita against 490,2). The severity of this situation is very clearly highlighted by the structure of R&D in terms of funding source. So, only a 32,3% share is supported by the enterprise sector, the root causes consisting in the undercapitalization of enterprises and the lack of efficient incentive schemes for performing R&D activities.

As there is clear evidence that the solution for a real improvement lies in the stimulation of the private investments in R&D, a more profound approach emphasizes the necessity of governmental incentive schemes that address with priority the needs and characteristics of SMEs.

Although Romania has in its Fiscal Code a provision regarding a 20% additional deduction (from the corporate tax base) for the R&D expenses, the implementing rules are very strict, thus making difficult to attain the eligibility criteria. In order to improve the situation, the EU best practices suggest some key characteristics regarding the design of the fiscal incentive schemes for R&D activities performed in enterprises. Also, in order to catch up, Romania has to develop a more “aggressive” approach regarding R&D, because the real convergence in terms of wealth and R&D intensity can be achieved only by generating higher growth rates than the EU average. So, there is a pragmatic need to apply the tax credit schemes as it follows:

- a. *Focus on R&D expenses* – the tax credit should address the total volume of R&D activities, at the same time ensuring that the unnecessary eligibility constraints are eliminated.
- b. *Mixed eligible expenses* – the incentive should take into account both capital and current expenses. Although the capital expenses are more easily to be tracked and controlled, the benefits of including the current expenses are vital for the SMEs, as this sector is hereditary predisposed to larger shares of personnel expenses in the total.
- c. *Using an additional deduction rate for eligible R&D expenses* – the fiscal gain should be offered as a reduction of the tax base for the corporate tax. It is clear that the mixed approach is more generous, and is more SMEs friendly, but the economic turbulences and the governmental budget constraints that we are facing now, are forcing us to chose the scenario that is more neutral in terms of cash flow for the Treasury.
- d. *A flat rate system* – the additional deduction rate should be constant, regardless of the volume of R&D expenses involved in the project.

Such a provision is important for keeping the scheme simple, thus lowering the probability of corruption occurrence.

- e. *Size differentiation* – the incentives should be higher in the case of SMEs. This design specificity is somehow in contradiction with the EU tendencies, but in order to mitigate the effects of the undercapitalization of Romanian SMEs, there is needed a more active approach.

Concluding remarks

In order to converge in real terms to the EU average standard of living, Romania has to develop an economic and social framework that boosts and supports a more rapid growth rate of the national economy. Our findings highlight that the wealthier a county, the larger the share of the experimental development and applied research. This is why we consider that the priority in terms of R&D stimulation should address the types of activities that are generating added value more rapidly, like experimental development and applied research. Also, the non-governmental sectors are more likely to invest accordingly to the priority stated above.

There is clear empirical evidence that the economic development is positively correlated to the intensity of R&D activities, so the policy making authorities should focus on facilitating private investments in R&D, and especially on specific fiscal incentive schemes for SMEs. As the contribution of the SMEs sector to the total R&D expenses is modest, there is a huge potential for growth.

These schemes are important and efficient because of they, by supporting enterprise's real needs, are not distorting the markets, thus facilitating and supporting R&D projects with very specific needs, with a more appropriate timing of the projects. Also, these schemes can stimulate a vast number of enterprises, especially SMEs, because the process is less bureaucratic and implies a marginal budgetary impact. In conclusion, it is evident that tax (fiscal) incentive schemes are complementary to the classical ones that the EU and the member states are most used to apply regarding the issues of R&D (direct grants or subsidies for the eligible projects, and indirect support for R&D that focuses on financing the research performed in universities and governmental research centers).

In this study we created a taxonomy for R&D tax incentive schemes, thus providing a tool for analyzing examples of such schemes from different

countries. The criteria by which we classified those schemes are the following: *the calculation basis for the tax credit, the type of eligible expenses, the type of tax credit, the dynamic of the tax credit rate, and size differentiation*. This taxonomy was used to describe and analyze ten examples of good practice in the field of tax incentive, from the European Union. After we classified and analyzed these examples, we made a step forward in order to find the best scheme design for Romania. As a result, an efficient incentive scheme for R&D activities in Romania could imply: *a focus on R&D expenses, containing both capital and current expenses, a benefit in form of an additional deduction for eligible R&D expenses, a flat rate system and size differentiation*.

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