

SLOVAK SCIENCE AND EUROPEAN RESEARCH SPACE

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Abstract: Since the year 1989 the transformation of Slovak society and economy has started processes of changes also in the science and technology. Fundamental changes have occurred in the personal, institutional and administrative security; in the forms of support, objectives; conceptual and legislative direction. In the year 1994 SR government has adopted the document "Conception starting points of the science and technical policy", which was updated in the year 2000 under the name "Conception starting points of the science and technical policy to the year 2005". Support objectives of science and technology are described in separate document "New model of financing science and technology". This document has created a base for support of science and technology. In these adopted documents government has fully accepted the goals of new established strategy of European research space. It has set up priorities in the fields of institutional and organizational objectives, propagation, evaluation of the R&D outcome, development of R&D infrastructure and international scientific-technical cooperation. Slovak Republic has successfully fulfilled approach conditions of EU in the domain 17: Research and development and has become a part of European research space. For a proper and effective function of research and development system we must know plans of developing in the long-term horizons. The document "Prognosis of development and exploiting science and technology to the year 2015" is being developed as a state program of science and development.

INTRODUCTION

Keynote speech of current Slovak government quotes: "Slovak government claims for worldwide trend that admit and strengthen function of science and technology as a primary resource and tool of improving competitiveness of economy, improving the social status of citizens and broadening of knowledge... will put emphasis on improving and making direct and indirect supporting forms of R&D more effective to bring Slovak Republic closer to EU and to make R&D of Slovak Republic one of the tools integrating Slovak Republic into EU research space, European and transatlantic structures." That statement fully matches to activities of member countries, candidate countries and activities of European commission. EU has stated at Lisbon summit (march 2000) ambitious goals to become in the next 10 years the primary economical comity. Good organised R&D in the forming European research space is the tool to reach the stated targets.

Declarations included in the keynote speech of Slovak government and also in the conclusion of Lisbon summit are at political level and it is necessary to fulfil them. Therefore at the meeting of premiers in Barcelona (march 2002) European Union has resolved a document focused on systematic augment of financing R&D. Member states of EU are obligated to increase the financial support of science, development and innovations that till the year 2010 the expenditures reach 3% of GDP (1% from budget, 2% private sources).

At the political level Slovak Republic is in fully conformity with countries of enlarged EU. EU has taken concrete measurements and steps to meet the initiated targets. In terms of EU as a unit, the most important adjustment was acceptance of document under name "Action Plan – Investments into research – COM (2003) 26". These document summarize and describe detailed steps to reach the goals of Barcelona summit. Every country,

according to agreement of Barcelona summit goals, is requested to compile such an action plan. In the year 2002 the Slovak government had adopted programs of state research and development and state orders of R&D which goal is to increase the productivity and efficiency of R&D and to build up the links between various sectors of R&D. The law number 203/2004 has established Science and Technology Assistance Agency. The budgeted agency financed from state budget funds selected programs of science and development. The programs are funded according to requirements of applicants. Other laws have passed – law number 132/2002 about science and technology within the meaning of later regulations (new version is currently approved within the government), law number 133/2002 about Slovak Science Academy, law number 131/2002 about universities (universities were transformed to public universities and are finance able from sources other to state budget), law number 231/1999 about state support within the meaning of later regulations, law number 13/2002 about the terms of transformation some budget and allowance organisations to non-profit organisations offering general beneficial services within the meaning of later regulations and etc.

Slovak Action plan of investment into science and development aims to:

- Secure the development of science and technology and the disposable potential to sustain economic growth of Slovak Republic and to integrate science and development as an equivalent partner into European research space.
- Slovak republic has to indispensably support development of education and qualification through the state programs, establish competitive environment of science, development, innovations and strong science sector tightly connected to industry.

Support of young research workers has to be an important endeavour. In the interest of preventing young research workers leaving abroad appropriate financial assessment also for PhD student has to be established as a primary goal. There are many outstanding problems that have to be overcome. Considering the situation that many students of the secondary level of university education apply for studies at the third level of university education in the EU countries new actions have to be taken that PhD scholarships can be financed from grants. That means that inceptors could work at a project chosen by tender offers and the scholarships would also be acquired from tender offers.

Slovak parliament has adopted the Conception of state science and technical policy to the year 2005. This conception assumes annual growth of state outlays for science of 10mil EUR. The efficiency and expediency of using the disposable resources of the state budget must be supported through system approach to special-purpose support of science and technology, through state programs of research and development, through state orders of science and development, and through Science and Technology Assistance Agency. State orders of science and development as special sections of tasks are focused on concrete development contemplations of science and technology emerging from sector policies.

Fulfilment of Barcelona goals is not only depended on annual increase of the state finances invested into science and development but is also depended on the amount of money invested by private sector. Finances invested by private sector is not merely dependent on their interest but is on a large scale dependent also at conditions created by the state to stimulate the support of science and development.

It is a fact that entrepreneurs have not been stimulated sufficiently to support science and development. In spite of this, the support of science and development in the last years has stayed stagnant and reach the level of 0.35% of GDP.

To rectify the state following have to be done:

- Revise relevant regulations dealing with purvey of investment stimulations that venal risk will be removed and administrative procedures will be simplified.
- Financial scopes dealing with support of strategic investments in Slovak republic have to be maximised.
- Reach closer interaction between industry and education in the interest of raising the common task of science and development.
- Building up the numbers of students studying strategic and perspective specialisations.
- Assign information for potential investors about low cost a high qualification of working force in the research of the Slovak Republic.
- Build strategic science-technology parks and centres of excellence to support strategic investments and establish optimal research and development capacities for that strategy.

The European Councillor has rectified the aim of European Commission to put forward suggestions helping to better integrate innovations into European area of knowledge with the aim to:

- Improve the use of intellectual ownership in the Europe.
- Further develop, strengthen private investment and exploit the risk capital for the R&D area.
- Better interaction between industry and science.

The European member states with the aim to reach the 3% investments of GDP into R&D plan to realize tools which will improve the efficiency of R&D and technological innovations. The preconditions are:

- Growth of public and private investments into R&D through many tools with the aim to strengthen the relationships between public sector and industry.
- Development of human resources.
- Creating environment which is suitable for growth of innovations.

It is necessary to increase the competitiveness, economical growth and especially positive political attitude to this area. The key proclamation is to make R&D more attractive for further investment of industry.

The area of development of innovations in the Slovak Republic is realized through state program of R&D under the name "Development of progressive technologies for powerful economy". The aim is to utilize already established R&D capacities of Slovak Republic to find out new science and technological knowledge in the area of the most advanced technologies.

To reach the aims stated at the Barcelona summit it is necessary to invest finances but moreover the efficiency of redistribution of the finances is even more important. The efficiency of redistribution must be focused into areas which will increase innovations and further economical development. It is important to establish competitive research space which will be the part of European research environment.

With the aim to fulfill commitments of Slovak Republic to reach the goals of Barcelona summit it is necessary that Slovak Republic must radically improve and support infrastructure of R&D through establishment of centers of excellence and networks of excellence. Centers of excellence may significantly help the top-ranking research programs. Those top-ranking research programs, with a high probability of obtaining new outstanding knowledge and profitable commerce utilization may be support through centers of excellence.

National centers of excellence have become a significant force and have helped to improve the quality of R&D and have also helped improve the competitiveness of national R&D within the world R&D. Networks of national centers of excellence exists in all advantages countries. Centers of excellence are established as legal entities of research and development. There are many legal forms; styles of management; levels of legal personalities of these entities. They are based on the basis of contractual junctions, program oriented clusters of scientists, technicians, university teachers, managers of the areas of science and technology, legal entities of research and development, physical persons of research, development and technological structures.

Within the special-purpose support of R&D in the Slovak Republic the state program of science and research under the name "Complex solution of support and effective use of R&D infrastructure" has been established. Through this program Slovak Republic the modernization of the infrastructure of R&D, centers and networks of excellence, high-tech laboratories and high-tech centers will be realized.

International science-technological cooperation is playing an important role of R&D development. Presence of Slovak Republic on the 5th and 6th framework program of science, technical development and demonstration activities have shown that the research community is interested in the cooperation with the science institutions and the workplaces of EU. It is possible to gain additional resources for financing R&D from the sources of EU through presence at framework programs. Research centers are preparing the presence in the 7th framework program.

Strategic aims which may help improve further development of science could be:

- Increasing the competitiveness of Slovak economy through support of R&D and consecutive use in the practice.
- Strengthen the function of Slovak R&D in the EU research space that Slovak Republic becomes appropriate partner to other countries of EU.

Success in the framework programs of EU is not only contingent by professional skills and adequate technical accessories but also by establishment and support of efficient informational-consultant activities. The task of Slovak Republic is to strength information flow about programs, especially through project of Slovak information-consultant academic network (SIKAS). Integration of Slovak Republic into 6th and 7th framework programs and success of Slovak science and development institutions will help better integrate the Slovak Republic into the European structures and will provide gradual increase of competitiveness of science and further also the whole Slovak economy.

Next type of support of science and development are the possibilities to draw finances from structures funds of EU. EU Enactment number 1784/1999/ES defines the tasks of the European social fond. Among the tasks are also support of sustainable

development and development of human resources. Support of qualified, educated and flexible work force; innovational and flexible organization of work; development of spirit of enterprise; conditions providing for establishment of new working places; support of knowledge and development of human potential in the science and technology are some policies of this fund.

MEASURES AND TASK TO IMPROVE THE QUALITY OF SCIENCE

In the area of science and technology The Ministry of Education of Slovak Republic will participate at the support from fond which is focused on development of human resources; development of lifelong education; support of R&D in the context of improving the quality of human resources (also in the areas of R&D). Support of complex development of young workers in R&D and using their intellectual potential through realizing excellent projects; creating carriers conditions of young generation are going to be the priorities.

To reach the goals of Barcelona summit, adapted to conditions of the Slovak Republic, it is necessary, according to government documents, realize following measures:

1. The proposal of state budget must ensure appropriate annual growth of expenditures for R&D in the period of 2005 to 2009 that in the year 2010 the state expenditures for R&D will reach at least the 0.6% of GDP.
2. Compile "Prognosis of development and exploiting R&D till the year 2015" with respect to the future demands, possibilities and risks of social-economical demands of science and technology and methods of sustainable development.
3. Prepare new proposals of state science orders financed from state budget that will ensure further development of science efficiency in the resorts, development of qualified human resources, develop and strengthen technological innovations as well.
4. Support integration of the Slovak Republic into European research space for example by establishing new international research centers with the presence of Central-European countries.
5. Find out new concepts of non-direct support of R&D within the aim to develop and strengthen private investments and risk capital into science and evolve environment able to grow.

R&D is unquestionably part of universities. It is not possible to teach students in a high quality without pulling them into R&D problems. Taking part at research grants, sector projects and applied research is an inseparable part of their financing. In general, character of science is global and is one of the reasons for international cooperation. To evaluate the quality of research work at universities the indicators are unambiguous:

- Number and types of contracts that faculty or university is able to contract. Important is also international recognition of the coordinator and the partners.
- Success rate of faculty or university at national grant agencies. Important role plays quality of science accessories in the laboratories.
- Applicability of the base research and research in the industry sectors, success rate of actual problems through business activities and cooperation with industry through doctor and diploma works.
- Number and quality of PhD works as a part of R&D.
- Amount of finance resources, number of gifts, long-term rent of expensive devices and devices obtained through research tasks and projects.

CONCLUSION

Slovak Republic does not apply principles of competition, like final goal, however like tools for optimal development of research work and education. Results of evaluation make a base for correct information for public, allow self-reflection and are base for distribution finance resources of subsidies. Evaluation criteria differ in dependency to areas of research, forms of research and objectives of evaluation. The outputs of R&D work evaluation are a base for accreditation of university; establishment of new study programs; do faculties' right to grant science-pedagogical or science – academics titles. In the last years there has been an increased demand for more detailed evaluation of impacts on realization the results of R&D and development of technology, environment and human – assessment technology [5].

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