

# INNOVATION AS AN ACCELERATOR OF COMPETITIVENESS AND ECONOMIC DEVELOPMENT

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*The article explores the importance and strategic objectives of innovation as an accelerator of competitiveness and economic development. It presents an analysis of innovation performance in Lithuania and other European Union (EU) economies. The possible trends and methods of innovation development are discussed.*

**Objectives:** a comparative analysis of innovation performance in Lithuania and suggestions for its development.

**Study focus:** current innovation performance in Lithuania and means of its development.

**Methods:** analysis and review of scientific material, publications and statistical data.

*The innovation performance study is based on data provided by Lithuanian Department of Statistics, supported by reports of European Commission, World Bank as well as other institutions, findings of numerous researchers, reviews and legal acts of Lithuania.*

**Keywords:** innovation, research and development, competitiveness, economic development

## Introduction

Strengthening competitiveness is the major objective in the policy of Lithuanian economy development. The economic growth and social well-being of small economies with little natural resources, as is characteristic of Lithuania, are greatly dependent on the capacity to produce and provide the market with competitive goods and services, which mostly demand not raw resources, but high technologies. For a competitive economy to develop, its infrastructure needs to be guided by qualified manpower, high-tech and knowledge-oriented sectors, where sophisticated and value-added products are developed.

Official acts declare that over the last decade Lithuania has gone through a fundamental economic change of its infrastructure, whereas competitiveness grew not fast enough. Analysis of Lithuanian industry in 2001 shows that knowledge, scientific research and technology-oriented sectors comprise merely 5.5 % of GDP (for comparison, in developed economies they hold 20–30%). This by no means can insure successful economic growth and sustain the present accomplishments in the prevailing knowledge-based world economy. Development of the innovation-friendly environment and innovation-supporting services, assuring investments into employee competence, scientific research and technology development are among the main ways to accelerate competitiveness.

The study calls for attention because setting of innovation priorities and accelerating innovation do not receive due attention in Lithuania, whereas in other EU economies interest in innovation activities grew in the 50ties. In the last decade, low-cost manpower and relatively cheap energy resources (electricity, gas, oil, etc.) have maintained the competitive advantage of Lithuania over Western EU enterprises. According to Lithuanian Department of Statistics, in 1996–2003 the average monthly earnings more than doubled in Lithuania. Lithuanian enterprises won't be able to capitalize on this competitive advantage any longer as the monthly earnings and costs of energy keep growing. Now, when Lithuania has become part of EU economy, the necessity of rapidly implementing effective means to approximate the economic efficiency and competitive edge of Lithuania and EU economies appeared. So, the main factor of accelerating competitiveness and conditioning business sector development in Lithuania is an active innovation performance.

### **1. Strategic objectives of innovation policy to strengthen competitiveness**

Economic development is an essential guarantee for improving the standard of living. In its turn, the standard of living depends on two main factors: employment and productivity. Productivity, employment and standard of living are closely interrelated. High productivity levels are fundamental for living standards. Nevertheless, increasing levels of productivity are not to be attained at the expense of creating new jobs. The capacity of attaining high employment rates augments the income of the majority of population and thus directly uplifts the standard of living. The growth of productivity and employment levels leads to overall development. In the compe-

titive market, the growth of productivity is essential.

One of the main sources of long-term productive growth is technical innovation, which is implemented through tangible and intangible investments. The research findings show that in comparison with the EU and other developed economies, productivity levels in certain sectors of Lithuania lag behind a few times. Due to the low productivity level the companies are not capable of sustaining their competitiveness in the market, which subsequently leads to a decline of production and export volumes as well as loss of jobs. In comparison with other EU economies, Lithuania is a small country, however, the level of economic development and the difficulties that emerged after the reforms of 1990 vary greatly by its regions (districts). Economic reforms and the enterprise privatization process in certain sectors and especially in agriculture and manufacturing resulted in a gradual reduction of production volumes and downsizing. As a result, unemployment developed and social problems emerged, which had to be solved immediately. In the run of reorganization, part of big manufacturing enterprises failed to restructure their production facilities and adjust to the emerging technological requirements of integration into the EU and world economies.

Technology or, broadly speaking, innovation becomes one of the main factors in the contemporary economy, which accelerates long-term economic growth and predetermines its structural reforms. This is why such developed economies as the USA, Japan, the EU and others keep developing and implementing innovation policies on the state level. Innovation policy creates the basis for investments and economic growth. There are four theoretically grounded types of innovation policy, which in scientific studies are designated as “technology-driven”, “demand-oriented”, “socio-oriented” and “economy-re-

structurisation-driven” innovations (Valentinavičius, 1999).

Economy-restructurisation-driven innovation could be the most appropriate policy for Lithuanian economy to follow. It is driven by a long-term interaction between technologies and society. In this way the innovation policy regulates the input of groundbreaking technologies into the development of socio-economic issues, industrial restructuring and the rapid growth of economy and standard of living. Aiming to attain these objectives, different organizational forms, new methods of leadership and systematic approach are needed to develop the scientific and manufacturing potentials as well as to strengthen the interaction between them.

Innovation is interrelated with market competition on the one hand and with cooperation on the other, since it is a rare practice when organizations implement innovations in entire isolation. The country through its innovation policy needs to support cooperation among institutions, since it creates a favourable environment for companies to exploit their innovative potential and strive for better results. These processes are to be encouraged regionally, countrywide as well as internationally. The primary goal of the new member economies of the EU is to approximate their living standards to that of the most wealthy member countries through shared experience and opportunities provided by Structural Funds. Lithuania finds the Irish experience in taking use of Structural Funds the most interesting (Valentinavičius, 2001). Before accepting support from Structural Funds, the level of economic development and infrastructure of Ireland was similar to the current one of Lithuanian economy. Irish economy made the greatest leap in 1994–1999. At that time the ultimate strategic goal of the country was to attain a long-term and consistent growth of economy and the development of the production sector as the

main driver of economic growth, which increases the volumes of employment and long-term welfare. To strengthen the production sector, the agenda for Production Sector Development was prepared; its integral part was Structural Funds support. The funding covered 18% of the whole Structural Funds support received by Ireland at that time. The leap of export was the most profound economic change, followed by significant investments into research and development (R&D). Investments including support from Structural Funds into this area reached 1.59% of GDP in 1996, instead of 1.3% in 1999. Due attention was paid to the development of tourism, transport infrastructure, regional economies and environmental protection.

In 1994–1999, the country aimed at attracting foreign direct investments into the newly developing business sectors rather than into traditional ones, the supreme goal of which was to get as many foreign entities to be established and jobs created as possible. Simultaneously, development of domestic companies was supported as a priority to keep the technological renovation of the companies, to establish new business units and new working places, to stimulate scientific research and develop innovations. A comparison of the Production Sector Development Agendas of 1994–1999 and 2000–2006 shows a shift in the planning of direct investments. Investments from the production sector shifted into scientific research and technological development. Another significant shift happened when financial support for the entire country was reassigned for distant districts of Ireland, which were most underdeveloped. In fact, these districts had become victims of the Irish economic boom. Besides, the main focus shifted onto strengthening the competitive edge of the companies rather than establishing new working places. The capital of European Social Fund was employed for re-qualification of manpower and

development of new skills, whereas the capital of the European Regional Development Fund was used for restructuring the Production Sector, the primary objective of which was to expand the sector of groundbreaking technologies and IT. This has not only prevented emigration, but stimulated emigrants to come back to the motherland to be there easily employed and establish private enterprises.

The strategic objectives of the EU innovation performance were set during the Summit in Lisbon held by European Council in March 2000. The Union set a new strategic goal to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion by 2010. A powerful engine for growth of a knowledge-based economy and society is high technologies, which can be developed only under the conditions of R&D. The conclusions covered two main prerequisites: 1) to achieve the maximal benefit of innovation development by optimal use of scientific research; 2) to create a friendly environment for starting up and developing innovative businesses. The Lisbon European Council has set general guidelines and five ultimate goals for innovations development in Europe: compatibility of innovation politics; improvement of the regulative innovation environment; stimulation of innovative businesses development; improvement of interaction among innovation system elements; building an innovation-open society.

One of the most recent European Commission releases on innovation policy is the Communication "Innovation Policy: Updating the Union's Approach in the Context of the Lisbon Strategy" (COM, Brussels, 2003). It was based on the EU structural changes and diversity of problems and means applied to accelerate innovation in the different economic space. The

Communication highlights many other forms of innovation, such as business model, business strategy and personnel training innovations, which currently don't receive due attention. This is noted while recognizing the declaration of Lisbon strategy, which says that R&D are the major contributor to innovation as well as acknowledging the objective set by European Commission in Barcelona, aimed at increasing R&D expense to 3% of GDP until 2010 and restructure the European market of science in order to increase its mobility and competitiveness. The Communication stresses that EU economies must accelerate innovation by all possible means, including tax exemptions. The New EU member countries (ten countries, which joined the EU on May 1, 2004) are encouraged to develop innovation strategies taking into consideration the experience of the elder EU member countries. However, they should be based on their own unique practice.

## **2. Analysis of innovation performance**

In order to define the innovation policy and the means of its development, out analysis of innovation performance should be carried to identify its strengths and weaknesses. To perform such analysis, precise and complete quantitative data should be used. Appraisal of national investment policy as well as benchmark of its national achievements is not feasible without internationally defined quantitative indicators. In order to assess innovation performance, the European Commission has developed the European Innovation Scoreboard (thereafter EIS) of indicators, which is annually adjusted and supplemented. Analysis of the EU economy is performed following unified methods. Innovation performance results are presented in European Commission releases (2002 European Innovation Scoreboard). The 2003 EIS (2003 European Innovation

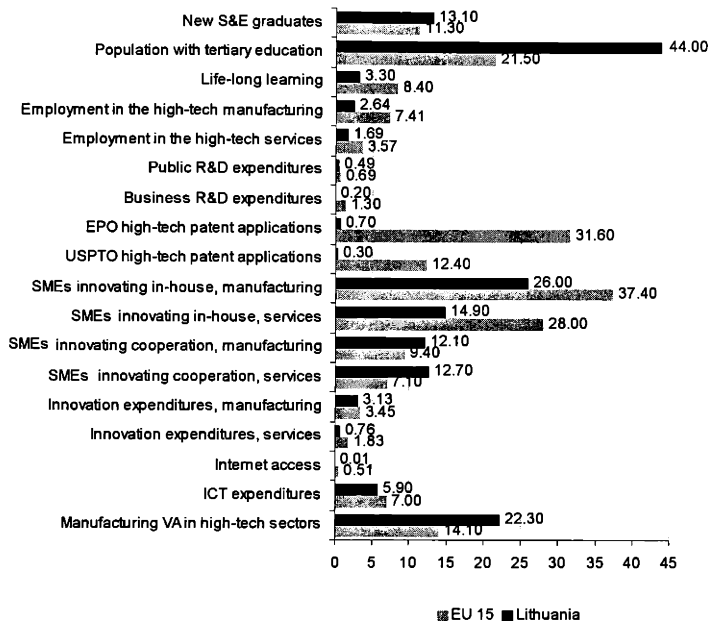
Scoreboard, Technical Paper Nos. 2 and 6) contains 19 indices divided into four groups: human resources; knowledge creation; transmission and application of new knowledge; and innovation finance, output and markets. Seven indices are split into sub-indices; for instance, SMEs innovating in-house (the 10<sup>th</sup> index) are divided between manufacturing and services. There are 28 comprehensive indices in total. European Commission didn't receive data enough to calculate 28 indices of innovation performance in Lithuania, thus Fig. 1 below presents a comparison of the calculated indices only.

Lithuania by four indices is outperforming the EU average (new science and engineering graduates; population with tertiary education; SMEs involved in innovation co-operation (% of manufacturing and services SMEs); and the share of manufacturing added value in high-tech sectors). International R&D indices must be applied to the peculiarities of Lithuania, as well as national data interpretation must be defined in legal acts. Lithuanian Department of Statistics propagates and already employs some concepts from the Frascati guide. In the Regular Report on Lithuania's Progress towards Accession, 2002 (Commission of the European Community, Brussels, 2002) it is indicated that Lithuania has made a notable progress in the sector of statistics. The performance of Statistical Council at Lithuanian Department of Statistics received a positive appraisal. The Council analyses the most important issues of statistical organization and methodology, considers methodological censuses, etc. It was the first one to successfully apply the EU economic classifications and statistical nomenclature. The Council develops national classifications, which are applied in statistical research.

The indices of innovation performance must be employed by all economic and governmental entities in Lithuania, just as they are used for R&D

evaluation in other developed economies. However, these criteria of evaluation are being implemented far too long in Lithuania. For instance, Daujotis et al. (2002) believe that data providers still do not possess experience enough to calculate quantitative indices and Department of Statistics cannot be blamed, since the Department itself is not capable of defining the extent of expenditures of high-tech entities, such as Biotechna, on R&D.

After V. Snitka (2002) has examined the indices of innovation performance in Lithuania in 2001–2002 delivered by European Commission and based on the data provided by Lithuanian Department of Statistics, he has raised certain concerns regarding their correctness. He asserts that it is not feasible to evaluate the exact expenditures of the business sector on R&D, since reliable information on expenditures in this sector doesn't exist; neither does a unified system for the Department to assess the expenditures. Similarly, it is difficult to determine which part of university funding is invested into R&D in practice. Besides, the data provided by Lithuanian Department of Statistics do not correspond to the national budget (Snitka, 2002). The author thinks that the index of population with tertiary education, which more than twice exceeds the EU average, is doubtful too. A similar appraisal was received by other indices such as SMEs expenditures on R&D and the share of manufacturing value-added in the high-tech sector (22.30%). According to V. Snitka, these indices were taken for export share by mistake (for comparison, the EU average is 14.10%). Other papers (Lithuanian Government Decisions, 2003) declare that the share of high-tech manufacturing comprises 5.5% of the total manufacturing. Moreover, certain evaluations are not precise and clear enough. Lithuanian Science and Technology White Paper Regulations turned its attention to this fact too. It says that presently there exists no department



**Fig. 1: Indices of innovation performance: EU 15 vs. Lithuania**

Source: 2003 European Innovation Scoreboard.

that could deliver a reliable information on the share of high-tech export, what the expenditures on R&D and innovation are, what human resources or summary and absolute numbers of patents are.

Figure 1 gives reasons for supporting the raised suspicions, especially given the fact that Lithuanian Department of Statistics started following EUROSTAT methodological and questionnaire recommendations only in 2002 while conducting a business innovation performance survey. Moreover, the survey was very small in its scope and covered only a few questions on innovation performance.

Analysis of the index trends is made while examining innovative performance in EU economies. The trends are calculated as the percentage change between the last year for which data are available and the average over the preceding three years, after a one-year lag. For instance, if the last year for which data are available is 2002, the average is calculated for 1998–2000, whereas the year 2001 is skipped. The trends of seven Lithuanian indices of innovation performance are better than the average EU indices. This holds out hopes for the future. For instance, business expenditure on R&D is rapidly increasing. If in 1998 it made 0.01% and in 1999 0.02% of GDP,

in 2000 and 2001 it reached as much as 0.13% of GDP. However such a great trend doesn't reflect the actual expenditure on R&D in the business sector.

New EU member countries significantly lag behind the elder EU economies by most of indices. Nevertheless, some of them outperform the EU average by certain indices. By half of all indices at least one new EU member country outperforms the EU average. This relates to all indices of population with tertiary education, the indices of employment in the high-tech sector, of SMEs innovating in-house (% of manufacturing and services SMEs), the index of SMEs involved in innovation cooperation (% of manufacturing and services SMEs), ICT expenditures, etc.

Among the new member countries, Czech Republic, Estonia, Hungary, Lithuania and Slovakia are the most innovative countries as measured by the number of leading slots. Lithuania outperforms by three indices: New S&E graduates (% of 20–29-year age group), population with tertiary education (% of 25–64-year age group) and SMEs involved in innovation co-operation (% of manufacturing and services SMEs). Though Lithuania is the leader among the ten new member countries by three above-mentioned indices, it doesn't give a sufficient reason to see its progressive innovation policy. Lithuania is greatly lagging behind by several indices. Only certain parts of innovation policy are developing in Lithuania, whereas a unified system and appropriate coordination of innovation proceedings is missing to assure the consistent development of innovation policy.

Sweden, Finland, Germany, Great Britain and Denmark are EU innovation leaders by a number of separate innovation indices as well as by summary innovation indices, whereas Sweden, Japan and the USA are the global innovation leaders. Summary innovation indices (SII)

give a cumulative (integral) evaluation of innovation performance. The method of calculating SII rescales all or most of indices and takes a weighted average of each. The European Commission applies two summary innovation indices to more accurately assess the results of innovation policy in the EU and other economies. Applying specific methods and having complete data, the first summary innovation index (SII-1) is based on all 19 innovation indicators. Due to the fact that the new EU member economies as candidate countries haven't submitted data by all 19 indicators to the EUROSTAT, the second summary innovation index (SII-2) was developed. This index uses a restricted set of 12 indices (all five indices drawn from the human resources category; all six indices from the knowledge creation category; and the index of ICT expenditures). However, due attention should be paid to the fact that this summary innovation index doesn't reflect on innovation finance, outputs and markets.

Summary innovation indices based on 12 indicators (SII2) (Fig. 2) prove the fact that in EU innovation the obvious leaders are Sweden and Finland, whereas Greece, Portugal and Spain are lagging behind. The new EU member countries lag behind the old ones significantly. The summary innovation index of Lithuania is far below the average EU index. Nevertheless, Lithuania surpasses Luxemburg, Spain, Portugal and Greece. Czech Republic, Estonia, Slovenia and Hungary are outperforming Lithuania among the new EU economies.

### **3. R&D finance and its impact on economic development**

Expenditure on R&D is fundamental for a knowledge-based economy. Its competitiveness and dynamics are primarily dependent on knowledge creation, dissemination and use. Know-

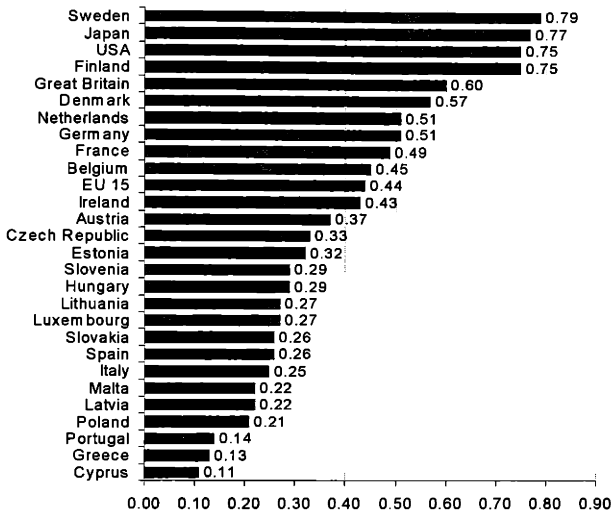


Fig. 2. Summary innovation indices of EU, USA and Japan economies

Source: 2003 European Innovation Scoreboard.

ledge is one of the manufacturing factors. The public R&D system, education system and the business sector create knowledge. Expenditure on R&D from different players (public and private sectors) shows their effort to create and use knowledge. Financial resources assigned for R&D indicate the innovation potential of the economy as well. The R&D intensity index describes overall funds allotted to R&D. The index is calculated as a ratio of overall funding to R&D and GDP.

In accordance with the long-term R&D strategy and Program of Implementation of Lithuanian Science and Technology White Paper Regulations, following the Lithuanian Government Decision of 22 December 2003 No. 1646, an objective was announced to increase the overall expenditure from overall funds up to 3% of GDP,

so that private sector gross domestic expenditure on R&D would comprise no more than 2% of GDP. In 2002, European Commission in Barcelona set a similar objective, which aimed at increasing R&D expenditure to 3% of GDP until 2010. Another part of the objective was to restructure the European market of science in order to increase its mobility and competitiveness. It is a realistic objective for EU economies (EU-15), in which R&D expenditure in 2000 came to 1.93% and in 2002 to 1.99% of GDP. However, it is a barely achievable goal for Lithuania due to its low gross domestic expenditure on R&D, which amounted to 0.6% of GDP in 2000 and 0.69% in 2001. Although starting with the year 2000 the overall expenditure on R&D began growing in Lithuania, its amount is far below the EU-15 average. Besides, the expenditure



*Table 1: Expenditure on R&D in Lithuania, 1995–2002*

	1995	1996	1997	1998	1999	2000	2001	2002
<b>Total, mill. Lt</b>	<b>114.9</b>	<b>164.9</b>	<b>217.2</b>	<b>244.5</b>	<b>220.3</b>	<b>269.9</b>	<b>326.8</b>	<b>344.7</b>
of which for, %:								
basic research	52.6	39.5	41.1	46.6	55.7	41.7	35.3	40.9
applied research	39.6	41.6	44.1	43.3	34.5	36.3	29.8	36.3
experimental development	7,8	18.9	14.8	10.1	9.8	22.0	34.9	22.8
expenditure on R&D as a percentage of gross domestic product (GDP)	0.46	0.52	0.56	0.56	0.52	0.60	0.69	0.68

Source: Department of Statistics of Lithuania.

res slightly reduced (to 0.68% of GDP) in 2002 (Table 1).

In Lithuania, the R&D system consists of public scientific institutions, public universities, public schools, parks of technology and science, economic entities which carry out R&D and applied research. However, cooperation between public institutions and the private sector in terms of developing the scientific potential is not close. Table 1 shows that instead of being applied-research-oriented, R&D institutions are mostly oriented towards basic research, which doesn't have an advanced buyer.

The main financial source of R&D is the state budget (Table 2). The contribution of clients, including the private sector, to R&D in Lithuania is incomparably smaller than in EU economies. In the developed economies, most of R&D expenditure come from the private sector. R&D expenditure from the private sector is as low as 30% only in the weakest EU-15 economies (Greece, Portugal). The low figures of private sector involvement into R&D funding show that large-scale industry in Lithuania doesn't show much interest in scientific novelties, whereas the SME sector has a limited possibility to invest into science-based products and the development of modern technologies. Also, after Lithuania has restored its independence, scientific research became outdated and wasn't resumed for some

time. This reduces the R&D potential to carry scientific research for the private sector. It is publicly acknowledged that renewal of scientific research has started in the recent years, however, it covers only a small part of R&D and practically has not yet improved the performance.

The biggest share of R&D expenditure is carried out by the public sector and the sector of higher education: in 1999 the R&D expenditure reached 0.5% of GDP, whereas the same expenditure from the private sector comprised 0.02% of GDP. In 2000 through 2001, a notable progress in terms of private sector expenditure on R&D occurred. A comparison with the other EU countries wouldn't be relevant, since many economies apply tax exemptions for entities investing into R&D. This assures regular declaration of expenditure on scientific research. Lithuania doesn't apply tax exemption, which raises certain doubts regarding the accuracy of data received from the private sector.

As regards the R&D expenditure as a ratio of overall funding to R&D and GDP, Lithuania is lagging further behind all the EU-15 economies, with the exception of Greece. Out of the new EU member countries, Lithuania insignificantly outperforms only Latvia, Poland, Slovakia and Cyprus (see Fig. 3). In 2002, the ratio of Lithuanian expenditure on R&D was 0.68%, whereas the EU-15 average was 1.99%, the USA 2.72%

*Table 2: Sources of R&D finance, % of GDP*

Expenditure on R&D as a percentage of gross domestic product (GDP)	1997	1998	1999	2000	2001
Total R&D expenditure, % GDP	0.57	0.57	0.52	0.60	0.69
of which for:					
tertiary education	0.21	0.22	0.20	0.22	0.21
public sector	0.32	0.34	0.30	0.25	0.27
business sector	0.04	0.01	0.02	0.13	0.21
share of state budget, %	72.0	74.4	72.4	57.9	53.3

Source: Department of Statistics of Lithuania.

and Japan 3.07%. Figure 3 shows that the EU-15 lagged behind Japan and the USA. R&D finance, in its turn, impacts the level of national employment. According to the index "researchers per 1000 labour force", the share of researchers in the EU is several times smaller than in the USA and Japan. Nearly half of PhD researchers coming from Europe to the USA stay there for a considerably long time, sometimes life-long (Daujotis, 2002). The data show that scientific research and new technologies presently can determine up to 50% of economic growth, and this percentage is increasing. There is no doubt that science and innovation are accelerators of economic growth.

Following the suit of developed EU economies, Lithuanian structural state policy is to be based on technological priorities which stimulate economic growth, and on solution of social problems within the country.

At present, it is important to capitalize effectively on the R&D funding opportunities from the EU Structural Funds and pay due attention to priority sectors and districts that will receive direct financial aid through Single Programming Document (SPD). Its positive outcome would indirectly reflect on the sectors and districts as well. The single Programming Document estimates the Lithuanian GDP growth from 1.2% in 2004 to 1.8% in 2006. The major benefit re-

sulting from Structural Funds is added value growth in the construction (although not that evident), manufacturing and education sectors. Due to an increase of employment in these sectors, benefits of Structural Funds would be evident also in trade, transportation and logistics, as well as communications.

As far as the impact of SPD on employment rates is concerned, the biggest growth of employment would be evident in building, service and education sectors. Presently these sectors possess an unexploited surplus of resources. Thus, Structural Funds would help to partly restore the jobs lost in the last decade due to the processes of restructuring and privatization (300 thousand jobs were cut in 1995–2002). Taking the greatest figure of employment, the downsizing affected approximately 149 thousand jobs in manufacturing, 35 thousand in building, 41 thousand in trade, transportation and communication, and 5 thousand in the education sector. Due to the loss of jobs because of restructuring, today Lithuania's manpower resources possess a potential to accumulate a much bigger aid from Structural Funds.

## Conclusions

1. Innovation as an accelerator of economic growth is the main factor sustaining the com-

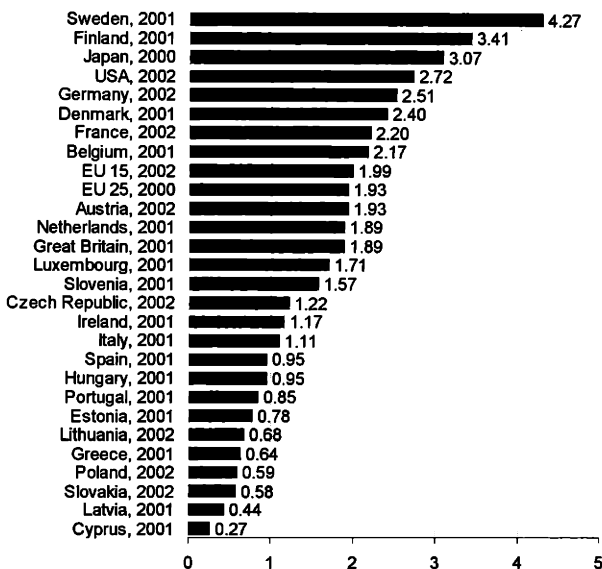


Fig 3: Intensity of R&D expenditure (ratio of overall funding to R&D and GDP, %)

Sources: EUROSTAT, EBPO and Department of Statistics. Data are provided for a last available year and are indicated next to the country. The EU-25 index doesn't include Malta.

petitiveness of developed economies and their high living standard, whereas R&D is the main driver for innovation development.

- To assess and compare innovation performance, quantitative innovation indices defined on the international scale are needed. Unfortunately, currently Lithuania is not capable of providing all necessary statistical data.
- A comparative analysis of innovation performance shows that on the average Lithuania outstrips the EU by 4 out of 19 indices (new science & engineering graduates, population with tertiary education, SMEs involvement in innovation cooperation (% of manufacturing and service SMEs) and share of manufacturing value-added in high-tech sectors).
- Nevertheless, by most of indices Lithuania lags behind the EU. By the summary innovation index (SII-2) Lithuania (0.27) significantly under-performs the EU average (0.44).
- Lithuania already understands the benefits of innovation programming, development of scientific and technical culture, as well as the benefits of innovation and the importance of advanced methods of its implementation. The legal base of securing intellectual property rights is already well developed, as is also the number of tools being implemented.
- R&D expenditure is evidently not sufficient (in Lithuania it comprises 0.68%, whereas the EU-15 average comes to 1.99% of GDP) and is poorly related to the benefits of R&D. R&D

performance, instead of being applied-research-oriented, mainly remains oriented towards basic research, which doesn't have an advanced buyer.

6. To speed up the innovation process in Lithuania, the statistical database of scientific research and technological development should be enlarged and R&D state budgeting should be increased. Through experience of other

economies (e.g., Denmark, China), tax exemptions that accelerate innovation in private economy should be considered.

7. To capitalize on the experience of other EU countries, it is essential to target the right priorities and avoid mistakes made by other economies while using Structural Funds for developing business and the whole economy.

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## INOVACIJOS – KONKURENCINGUMO IR EKONOMINĖS PLĖTROS KATALIZATORIAUS

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S a n t r a u k a

Straipsnyje nagrinėjama inovacijų, kaip konkurencingumo didinimo ir ekonominės plėtros skatinimo katalizatoriaus, svarba ir strateginiai tikslai. Pateikiama inovacinės veiklos lyginamoji analizė Lietuvoje ir kitose Europos Sąjungos (ES) šalyse. Aptariamos galimos inovacinės veiklos skatinimo kryptys ir būdai. Tyrimo tikslas – atlikti inovacinės veiklos Lietuvoje lyginamąją analizę, pasiūlyti jos skatinimo būdus. Darbo objektas – inovacijų esama

padėtis ir jų skatinimo būdai Lietuvoje. Tyrimo metodai – mokslinės literatūros ir publikacijų, statistinių duomenų analizė, lyginimas ir apibendrinimas.

Inovacinės veiklos tyrimas atliktas remiantis Lietuvos statistikos departamento duomenimis, Europos Komisijos ataskaitomis, Pasaulio banko ir kitų pasaulinių organizacijų atliktų tyrimų oficialiomis ataskaitomis, taip pat įvairių autorių ir institucijų atliktais tyrimais,

apžvalgomis bei Lietuvos įstatymais ir poįstatyminiais aktais.

**Pagrindiniai žodžiai:** inovacijos, moksliniai tyrimai, konkurencingumas, ekonominė plėtra

Straipsnyje pateikti tyrimų rezultatai patvirtina, kad inovacijos tartum ekonominės plėtros katalizatorius yra vienas svarbiausių veiksnių, palaikančių išsivysčiusių šalių konkurencingumą ir aukštą gyvenimo lygį. Inovacijų diegimo spartinimo varomosios jėgos yra mokslinio tyrimo ir eksperimentinės plėtros (MTEP) darbai. Inovacinei veiklai įvertinti ir palyginti su kitomis šalimis yra reikalingi tarptautiniu mastu nustatyti kiekybiniai inovacinės veiklos rodikliai, tačiau tam Lietuvoje kol kas nėra visų reikiamų statistikos duomenų.

Atlikta lyginamoji analizė parodė, kad Lietuva pagal 4 inovacijų rodiklius iš 19 (pagal naujų mokslo ir inžinerijos absolventų, gyventojų, turinčių aukštąjį išsilavinimą, smulkaus ir vidutinio verslo įmonių (SVVĮ) inovacinėje veikloje bendradarbiaujančių su kitomis organizacijomis (% nuo visų SVVĮ gamybos ir paslaugų sektoriuose atskirai), gamybos sukurtos pridėtinės vertės dalies aukštųjų technologijų sektoriuje rodiklius) užima aukštesnę negu Europos Sąjungos (ES) vidurkis padėtį, tačiau pagal daugumą – labai atsilieka. Pagal suvestinį inovacijų indeksą (SII-2) Lietuva (jis lygus 0,27) daug atsilieka nuo ES vidurkio (0,44).

*Įleikta 2004 m. rugsėjo mėn.*

Lietuvoje jau suprasta inovacijų propagavimo – mokslinės ir techninės kultūros plėtojimo bei supažindinimo su inovacijų teikiama nauda ir pažangiaisiais šios srities darbo metodais – svarba. Pakankamai išvystyta įstatyminė intelektualinės nuosavybės apsaugos bazė, yra numatyta nemažai priemonių, kurių dalis jau pradėta įgyvendinti, tačiau MTEP darbų finansavimas yra aiškiai nepakankamas (Lietuvoje – 0,68 proc., ES–15 vidurkis – 1,99 proc. BVP) ir menkai siejamas su galutiniais rezultatais. MTEP veikia daugiausia orientuota į fundamentinius, tiesioginio užsakovo neturinčius tyrimus, vietoje užsakomųjų taikomųjų tyrimų.

Norint paspartinti inovacinius procesus Lietuvoje reikia padidinti MTEP darbų finansavimą iš valstybės biudžeto ir, atsižvelgiant į kitų šalių patirtį (pavyzdžiui, Danijos, Kinijos), numatyti mokesčių lengvatas skatinančių inovacijų diegimą įmonėse. Be to, būtina išplėsti mokslinių tyrimų ir technologijų plėtros statistikos duomenų bazę, tai leistų tiksliau įvertinti inovacinį potencialą ir racionaliau paskirstyti išteklius.

Lietuvai, siekiančiai pasinaudoti kitų ES šalių patirtimi, svarbu nusistatyti tinkamus šaliai prioritetus ir vengti klaidų, kurias darė kitos šalys, naudodamos struktūrinių fondų paramą verslo ir visos šalies ūkio plėtrai.