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APPROACH TO INNOVATIVE ACTIVITIES BY LITHUANIAN COMPANIES IN THE CURRENT CONDITIONS OF DEVELOPMENT

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Abstract. The paper aims to reveal the approach of Lithuanian companies towards innovations. In order to take into account conditions, specific to the considered country an, overview of Lithuanian economy with a closer look at demographic and employment tendencies is presented; analysis of statistically estimated innovation performance and state innovation policy performed. Insight into factors driving innovations into Lithuanian business companies is being made through questioning the randomly chosen 1001 Lithuanian business companies. The performed survey allows us to disclose how companies react to factors fostering and restricting innovations, how they perceive role of state policy in the process of innovative activities. Obtained results provide us with empirical evidences how business companies react to specific economic conditions, and if there is a sufficient correspondence between educational system and supply of know-how susceptible employees demanded by business companies.

Keywords: innovations, business companies, Lithuanian economy, state policy.

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1. Introduction

In the last few years, Lithuania, together with other Baltic states, has shown an impressive economic performance followed by a considerable slowdown of growth rates. The country has experienced huge problems related to low productivity of labour, high energy consumption in industry, growing prices of natural resources, as well as cost-based competition in the business and industry sectors. These factors impact international competitiveness of the Lithuanian economy in the long term. Due to the fact that in the structure of Lithuanian

economy dominates the labour intensive industries with a moderate share of technology driven industries, innovation policy has obtained a higher importance. Innovation activities are seen as the phenomenon impacting development of the economy and companies via modernization of production and service structures, the creation of new and improvement of existing products, an increasing of their competitiveness on an international scale. If a country lacks natural resources, creativity helps find ways for their effective use of substitutes that subsequently could reduce shortages. There is a vast literature considering innovations impacting the economy growth in developed and developing countries (Coe and Helpman 1995; Coe *et al.* 1995; Teixeira and Fortuna 2004; Tvaronavičienė and Grybaitė 2007; Tvaronavičius and Tvaronavičienė 2008).

This paper aims to contribute to recent elaborations by focusing on the actual effects of the Lisbon process on the Lithuanian innovation performance. We are going to comment on the country profile taking a closer look at Lithuanian economy. In our further analysis, we will analyze innovation performance and innovation policy in Lithuania. The paper presents the results of the survey in order to detect business sector's attitude towards innovations.

2. Overview of Lithuanian economy

Lithuania, as well as other post-communist countries, has experienced a complicated way of reforms from a planned to a market economy. Reforms that were implemented in all spheres of life created preconditions to eliminate many obstacles and crises that enabled Lithuania to substantially change its command economy base and to implement solutions, which laid the foundations for a market.

In recent years, the economy of Lithuania has been developing at an almost stable rate. In 2007, the real GDP growth in Lithuania reached 8.8% and was higher than in 2006 (Fig. 1). Notably, the highest real GDP growth in 2007 was recorded in Slovakia (10.4%) and Latvia (10.3%), while the lowest – in Hungary (1.3%) and Italy (1.5%) (Lithuania in Europe 2008). According to the Annual Report of the Bank of Lithuania in 2007, the economic development of the country was pushed up by a buoyant growth of investment at the start of the year, a better absorption of EU funds, rapidly soaring income and increasing consumption supported by still intensive borrowing (Annual Report of the Bank of Lithuania 2008). In 2007, the highest per capita GDP, expressed in purchasing power standards, was in Luxembourg, where it was almost 3 times higher than the EU average, in Ireland – by almost 50%, in the Netherlands – by about 30% higher than the EU average. The lowest per capita GDP, expressed in purchasing power standards, was in Bulgaria and Romania, where it made up just about 40% of the EU average (in each). In Lithuania, this indicator has grown steadily from 2001 (Fig. 2). However, in 2007 per capita GDP in Lithuania reached 60% of the EU average.

Notably, the most decisive impact on GDP growth for 2006 was made by activities of enterprises engaged in manufacturing, construction, transport, financial intermediation and real estate. More value added was generated by the said enterprises in 2006 (by approximately 11%) than in 2005, while in enterprises of other economic activities by just 4% more (Inno-Policy Trend Chart – Policy Trends and Appraisal Report 2007). About 50% of the gross value added fell in enterprises of manufacturing, construction, financial intermediation

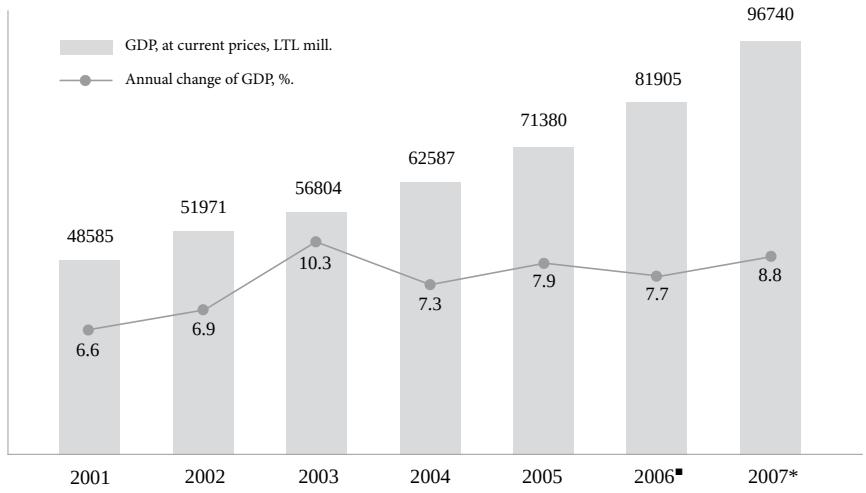

Fig. 1. GDP and annual change of GDP. *Source:* The Department of Statistics [Lithuania in Europe 2008]

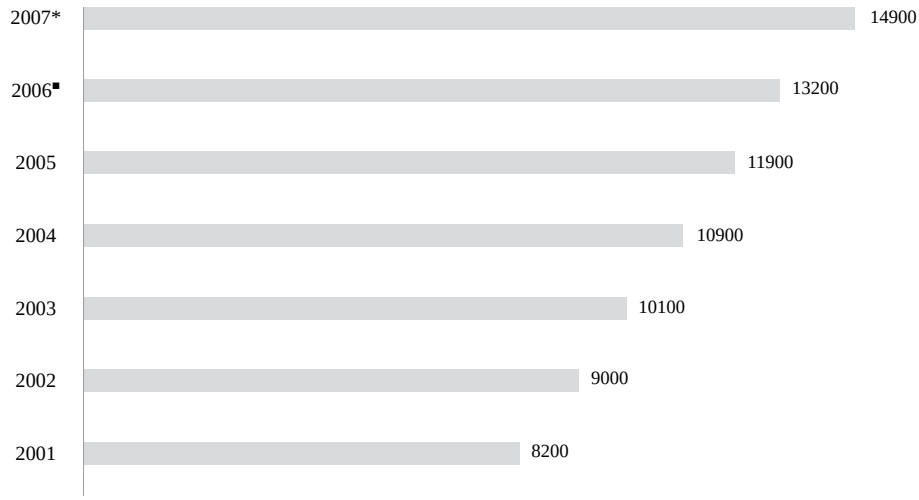

Fig. 2. GDP per capita. *Source:* The Department of Statistics [Lithuania in Europe 2008]

and real estate. In 2007, the most important driver of the value added growth was a buoyant increase in activity of trade enterprises: the value added created by retail and wholesale trade enterprises accounted for a quarter of the growth of GDP in 2007. Notably, the growth rate in the construction sector was somewhat slower compared to 2006, with the exception of the first quarter, when the activity was pushed up by seasonal factors. However, a direct effect on the real GDP growth was due to an expanding share of this sector in the economy. Taking into account global trends of economies' slow down, most likely, in the near future not traditional, but innovative industries will serve as driving economic forces.

Meanwhile, a close look at the Gross domestic expenditure on R&D (GERD) reveals that Lithuania lags behind other countries according to this criterion. In 2007 the highest GERD was in Sweden (3.73% of GDP), where it was almost twice higher than the EU average and in Finland (3.45% of GDP). Lithuanian GERD comprises 0.8% of GDP. To conclude, expenditures of industry and government seem to be insufficient. It is worth to note, that in Lithuania the highest share of investment into R&D is financed by government sector (Fig. 3).

According to data of the Statistics Department per thousand of Lithuania citizens, in 2006 on average there were 18 companies and 25 persons performing individual activities. In the European Union there are 52 companies per one thousand citizens or twofold more than in Lithuania. According to the research, carried out by scholars, people in Lithuania in general are risk averse and prefer hired work over engagement into businesses (Solnyskinienė 2008). Intuition is, that those factors serve as innovative activities restricting development.

The evidence suggests that Lithuania, up to 2004, was a net emigration country. Some scholars expect that in future Lithuania, as well as other Baltic countries, will experience net immigration (Schuller 2008). However, now the percentage of emigrants from Lithuania tends to be the highest among the EU members. According to the Department of Statistics since 1991 about 10% of the population emigrated from Lithuania. In 2007, crude net migration rate of Lithuania was –1.6 (per thousand people). Only Romania (–4.7), Bulgaria (–4.4) and

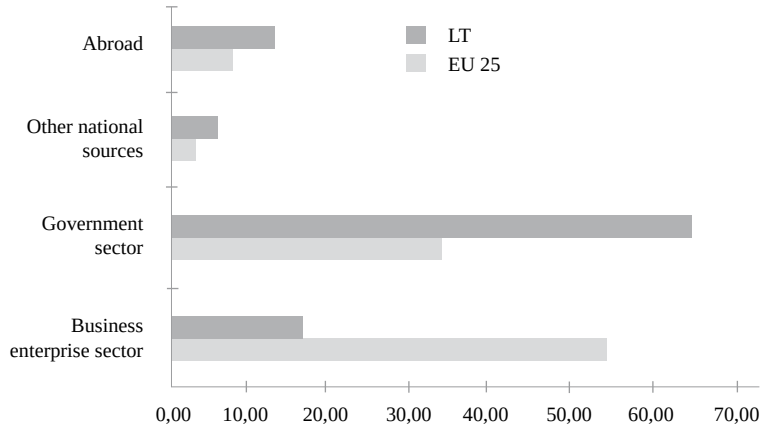

Fig. 3. The share of investment in R&D (%) in Lithuania and EU. *Source:* Eurostat, 2008

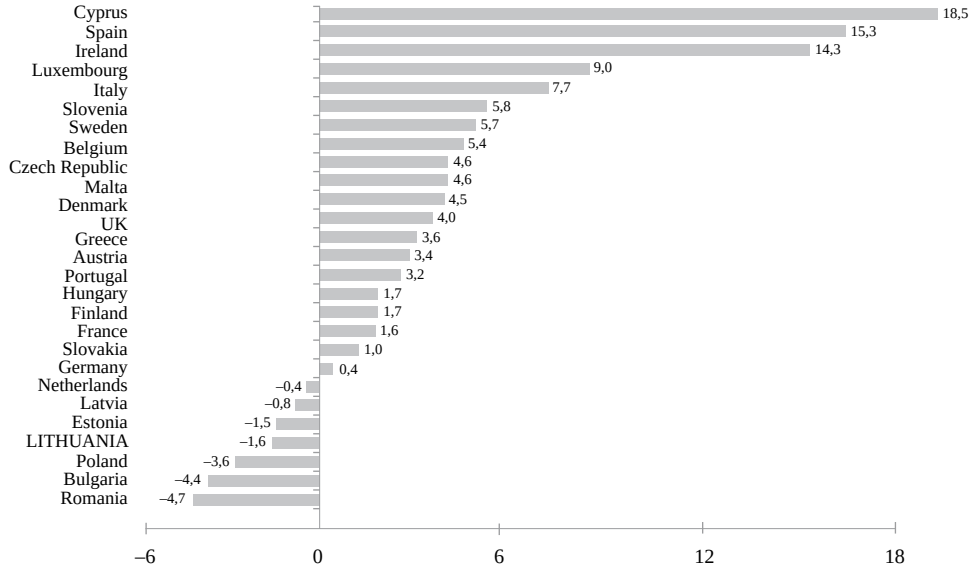

Fig. 4. EU Member States crude net migration rate (2007, per thousand population, Eurostat provisional data)

Poland (–3.6) overtook Lithuania according this benchmark (Fig. 4). Hence, from the recent data, presented above, we can draw a conclusion that due to emigration Lithuania loses both, the unqualified and, what is even more important, the qualified population. And this process creates preconditions for economical, social, cultural and other changes.

In the economically developed countries more attention is given to the problem of brain drain. It has become an object of interest and research in these countries much earlier than in the economies of transition. This situation can be explained by a more extensive and accurate statistics provided in different sources, as well as the abundance of different research (Bagdanavičius and Jodkonienė 2008). Scholars state that the emigration of specialists from Lithuania is not massive, since the demand of qualified labour abroad is smaller than that of unqualified one; however, high qualifications and the professional competence of workers from both the public and private sector becomes a precondition of brain drain from Lithuania.

The high emigration rate made an impact on unemployment rate. According to labour force survey (LFS) data, the unemployment rate, which stood at 10.6% in late 2004, shrank more than twice in the last two years and was merely 3.9% in the third quarter of 2007, while the long-term unemployment rate fell by 2% in 2007 (Statistics Lithuania 2008). As the demand for labour kept increasing and the number of the unemployed continued to decline, the growth of wages began to accelerate. In 2005 and 2006, wages soared by 11% and 18% respectively, and in three quarters of 2007 they were approximately 20% higher than a year ago. This situation influences optimistic expectations of the population and coupled with favourable borrowing conditions, fuels the growth of consumption which has been faster than the growth of population income. However, income has been rising faster

than labour productivity (labour productivity amount by 51% of EU average), which is a threat to competitiveness of Lithuanian companies on foreign markets. One of the effects of the steady increase in earnings is that Lithuania is losing wage-sensitive industries such as textiles to cheaper locations in the Commonwealth of Independent States (CIS) and China. Therefore, innovations create preconditions for business companies to survive on the market and increase productivity.

3. Analysis of innovation performance and innovation policy

The prevalence of traditional industries, high energy consumption in industry, and a low productivity rate are the major factors restricting country's competitiveness on international markets and create preconditions to search for new development resources.

Scholars state that one of the most distinctive features of the 'new' theories of growth has been the increasing importance attributed to human capital and productive knowledge and to the interaction of these two factors (Teixtera and Fortuna 2004; Tvaronavičienė and Tvaronavičius 2006, Tvaronavičius, Tvaronavičienė 2008). Innovations are one of the key factors of development of the country's economy and enterprises (Korsakienė *et al.* 2006). It is widely agreed that the development and intensification of innovation activities enable multiform modernization of the production and service structures, creation of new and improvement of existent products, and used technologies as well as increasing their competitiveness on an international scale, which is one of the main factors of the country's economy development. Innovation is a source of profit and high added value until the innovation is spread around and the competitive advantage provided by it disappears (Čiegis and Jasinskas 2005). Porter points out that in global economy the competitive advantages lie increasingly in local variables such as knowledge, relationships, and motivation (Porter 1998).

The major challenge Lithuania faces today is upgrading its sustained traditional industries towards high value-added, knowledge-intensive modern industrial sectors regardless of their position in the low high-tech industrial classification (Inno-Policy TrendChart – Policy Trends and Appraisal Report 2007). It should be noted that in recent years Lithuania has made tremendous progress in innovation policy making and implementation. The Lisbon process and the implementation of the National Reform programme (NRP) are seen as the major contributors to this progress. For instance, structural funds gave Lithuania a real base for implementing and sustaining a wide range of innovation support measures, both in the public and private business domains. Furthermore, knowledge and human resources development capacities are being upgraded for national economy needs. However, it is too early to assess the success of the measures implementation and therefore an analysis of the current innovation performance of Lithuania has to be provided.

The Knowledge Economy Index (KEI) of Lithuania, representing the overall preparedness of a country towards the knowledge economy (KE), rose from 43rd in 1995 to the 31st position in the current 2007 rankings and now amounts 7.49 (The World Bank Development Program 2007). It should be noted that this index aggregates volumes and status of human resources, innovative policy, information technologies and innovative business. For instance,

according to the KEI Sweden, Denmark and Norway are seen as the world's most advanced knowledge economies (with 9.26, 9.22 and 9.17 respectively).

Lithuania has an overall innovation performance that places it among the group of "catching-up countries" with a performance that is well below EU average but increasing towards the EU average over time. Other EU countries within this group and with a similar level of performance are Malta, Latvia, Hungary, Greece, Slovakia, Poland, Portugal, Bulgaria and Romania (European Innovation Scoreboard ... 2007). Over the past 5 years Lithuania's innovation performance has increased rapidly and, based on this trend, it would reach the EU average level of performance within 10 years (Tvaronavičienė *et al.* 2008). Lithuania performs particularly strongly in the dimension of Innovation drivers, where it is above EU average in the indicators of S&E graduates, Population with tertiary education and Youth education attainment level (Fig. 5). It performs at a relatively low level in the dimension of Intellectual property, Business R&D expenditures, public funding innovation, high-tech exports, and employment in high-tech manufacturing.

The analysis allows concluding that Lithuania is less efficient than EU average in transforming innovation inputs into outputs (Tvaronavičienė and Degutis 2007). Fig. 6 indicates that Lithuania performs well according to the innovation drivers which are measured by the share of S&E graduates per 1000 population, the share of working age population with a tertiary education, the broadband penetration rate, and the share of working age population active

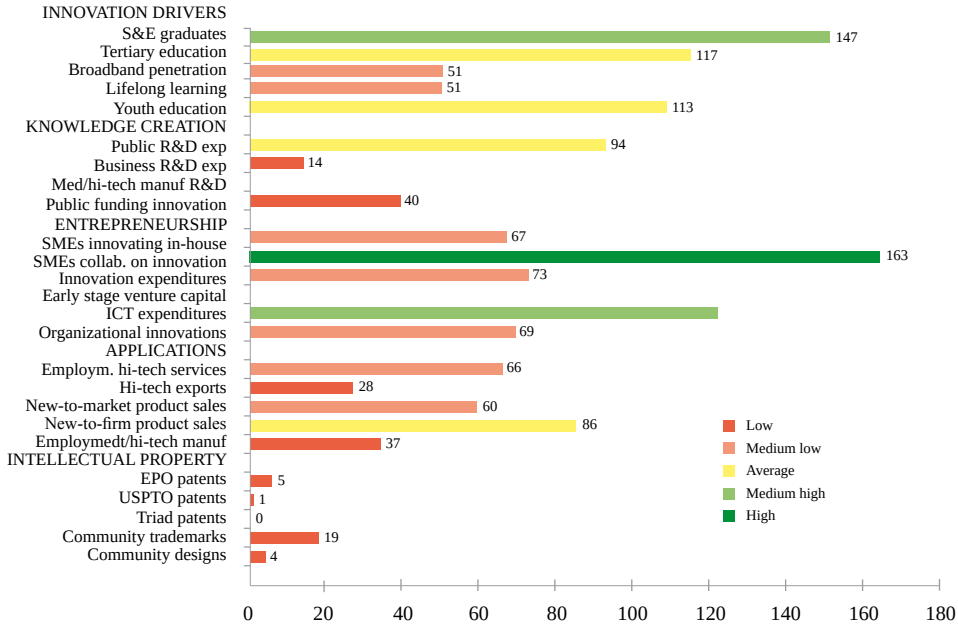

Fig. 5. Innovation performance chart. *Source:* European Innovation Scoreboard ... 2001

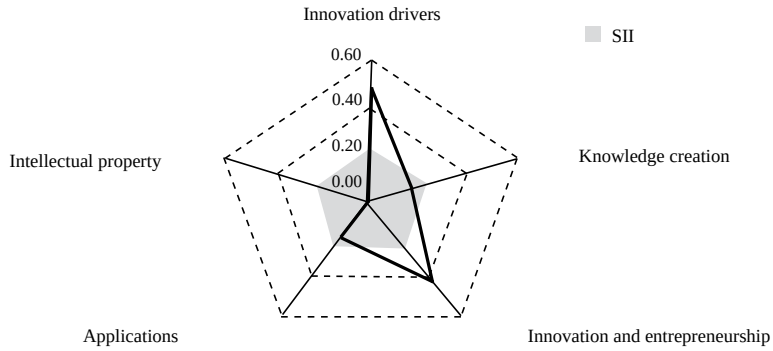

Fig. 6. Performance chart by innovation dimension. *Source:* European Innovation Scoreboard ... 2007

in lifelong learning and the youth education attainment level, but lags behind the Intellectual property indicator, which is measured by the relative amount of EPO patent applications, USPTO granted patents, Triad patents, Community trademarks and Community designs.

According to the survey carried out by the Department of Statistics in 2004–2006, in Lithuania, innovation activities were carried out by 18.4% of the enterprises. The results of the previous survey (carried out in 2002–2004) allow to conclude that the share of innovative enterprises in the total number of enterprises decreased by 5% (Samuolis 2007). The presented data illustrates that there is a lack of incentives for innovation activities in the private sector that leads to a low innovation performance of the system as a whole. It is worth noting that Lithuania's public policy influencing development of new ideas is inadequate (Tvaronavičienė and Ginevičius 2003).

4. Survey of business sector attitude towards innovations

A survey was conducted in order to reveal the attitude of business companies towards an innovative activity. It is based on responses to a questionnaire embracing aspects of innovation implementation in Lithuanian enterprises. Taking into account that service sector dominates in Lithuanian economy and is considered as less concentrated in comparison with the industry sector, another goal of the survey was to detect differences between attitudes of industry companies and service companies.

Companies that were queried have been chosen randomly. The respondents were questioned directly. A survey was conducted in February-March of 2007. 1264 enterprises from different business sectors in Lithuania participated in the investigation. Industry companies, taking part in the survey, are attributed to the following branches: production and distribution of electricity, gas and water; manufacture of refined petroleum products; manufacture of chemicals and chemical products; manufacture of basic metals; manufacture of machinery and equipment; manufacture of wood and products of wood; manufacture of paper and paper

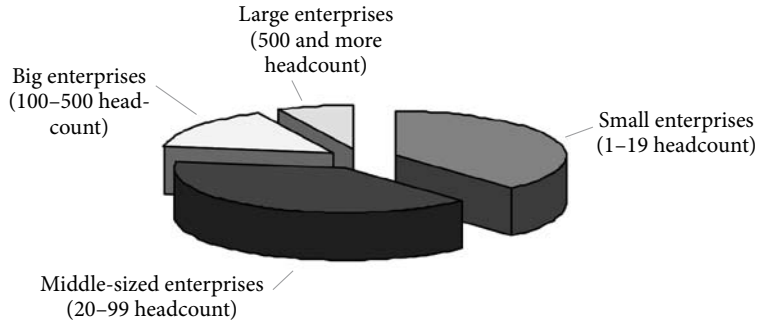

Fig. 7. Structure of respondents by size

products, manufacture of textiles and manufacture of food products. Service companies, participating in the survey, are attributed to the following sectors: construction, tourism, transport, telecommunication, domestic trade and financial intermediation. 1001 responses were considered as acceptable for scientific generalization and were used for driving tendencies. Their division across sectors of economy: 715 companies are attributed to service sector and 286 to industry one. Structure of respondents according to size is in Fig. 7.

4.1. Factors fostering implementation of innovations

Striving to assess factors fostering the implementation of innovations, respondents were asked to evaluate the role of suppliers, clients, Governmental innovation policy, competitors, science and technological parks, business incubators, scientific research institutions. The respondents indicated, that clients (70%), competitors (46%) and suppliers (14%) take a leading role in the promotion and motivation of innovations' implementation* (Fig. 8).

Today there are 10 technology parks operating in major cities of the country, 7 business incubators in different regions, and 42 business information centres nationwide. All these structures are founded by the Ministry of Economy and local authorities. The data of survey allow concluding that the role of technology parks and business incubators in fostering implementation of innovations is considered as rather week. Week institutional mechanisms do not encourage links between business sector and research institutions. Hence, the role of governmental innovation policy in fostering implementation of innovations was perceived as rather insignificant.

The responses of industry and service companies did not differ significantly. However, a higher percentage of service companies indicated that they did not have any idea about innovations (5% companies). Meanwhile, only 1% of all industry companies did not have any idea about innovations.

* The question was: What promotes and motivates innovations' implementation in your enterprise?

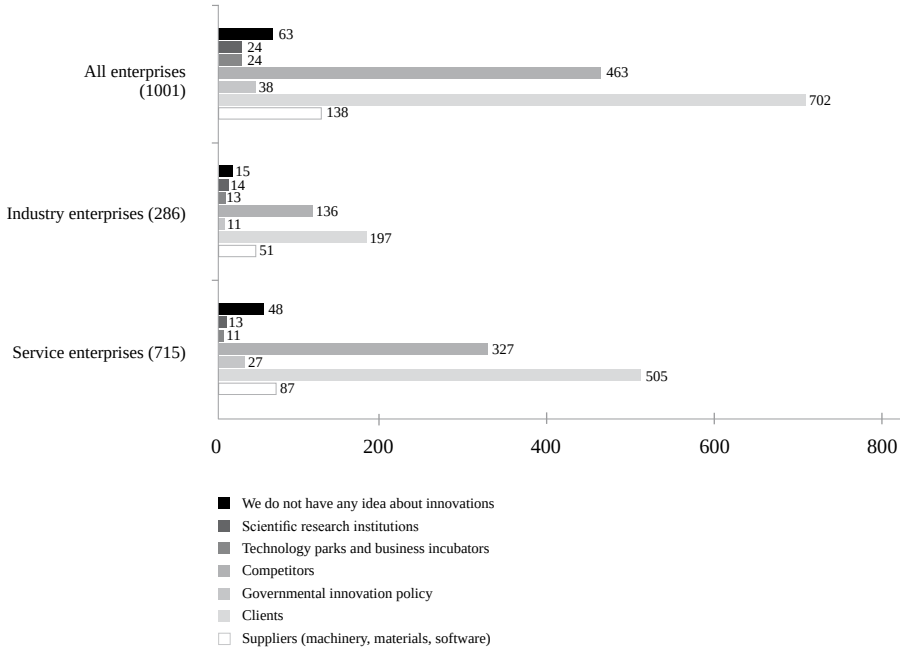

Fig. 8. Factors fostering implementation of innovations

To conclude, strong networking relations, established in the competitive environment, serve as the main driving forces of innovation in Lithuania. The role of scientific institutions and state programs, as factors initiating innovations, is much less and does not compare to the role of factors mentioned above.

4.2. Perceived efficiency of state policy

The respondents were asked to indicate the main sources of information on new technologies*. The obtained data allow concluding that business companies obtain information directly from suppliers, in exhibitions (49%), rely on technology information databases (35%) and virtual technology portals, virtual data bases (24%) (Fig. 9). On the other hand, state scientific and research institutions are not seen as the source of information for new technologies.

The responses of industry companies and service companies did not differ significantly. To conclude, weak relationships between business companies and scientific institutions is seen as one of the factors impacting low value added innovations, developed without input from the R&D sector. Therefore, the policy impacting closer cooperation links between business and R&D sectors should foster R&D intensive innovations in business sector and facilitate shift from labour to knowledge intensive economy.

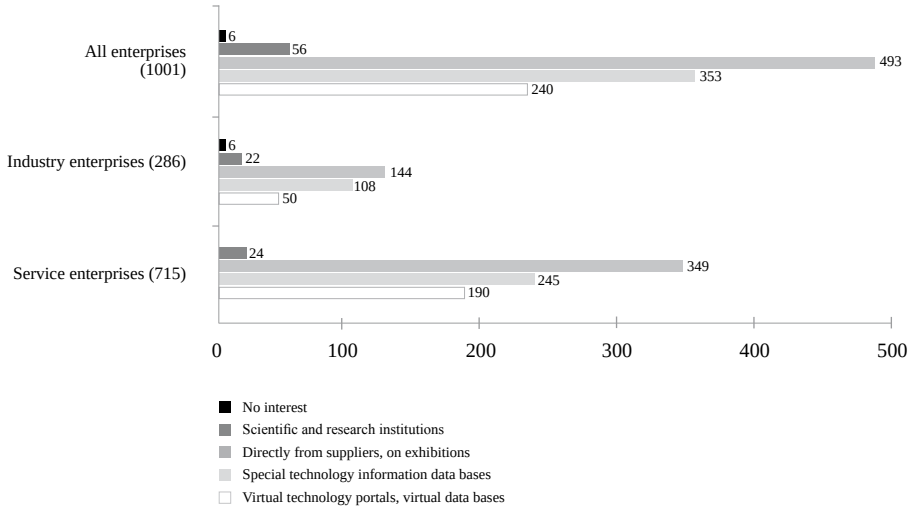

Fig 9. Main sources of information about new technologies

* The question was: Where do you look for information about available new technologies?

The responses of respondents to questions about factors retarding technology transfer process* led us to reveal that business companies indicate the lack of external funds (34%), lack of qualified employees (25%) and insufficient profitability of company (24%) (Fig. 10).

The responses of industry companies and service companies allow concluding that factors restricting technology transfer process differ. Service companies indicate such factors as follows: lack of external funds (35%) and insufficient profitability of company (23%). Meanwhile, industry companies indicate such factors as lack of qualified workers (insufficient quality of studies, 34% and lack of external funds, 33%.

To conclude, insufficient resources for higher education sector, combined with the growing numbers of students, reduced the quality of education. On the other hand, insufficient investments of industry companies into vocational training lead to obsolete qualifications.

Responses to the following question are commensurate with assumption about unawareness of business companies about state programmes devised in order to facilitate implementation of innovations. The majority of business companies indicated role of government as small (40% of all respondents), non-existent (28%) or limited (20%) (Fig. 11).

The responses of industry companies and service companies did not differ significantly.

Notably, Lithuanian innovation policy scope remains narrow, i.e. it is oriented towards high-tech sector development. On the other hand, more efforts have to be put in applying innovation policy in broader scope, i.e. upgrading technologies in traditional industry sectors and upgrading skills and qualification.

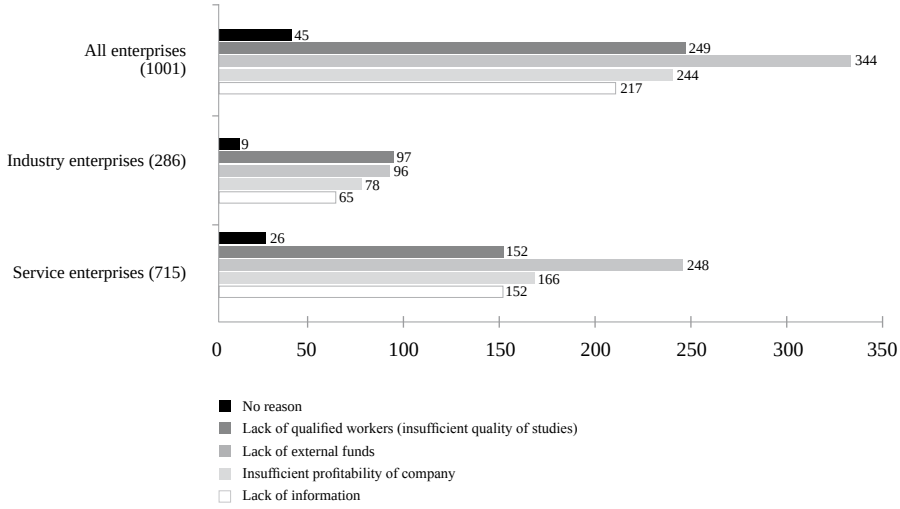

Fig. 10. Factors retarding technology transfer

* The question was: What impede your company's direct participation in new technology implementation process?

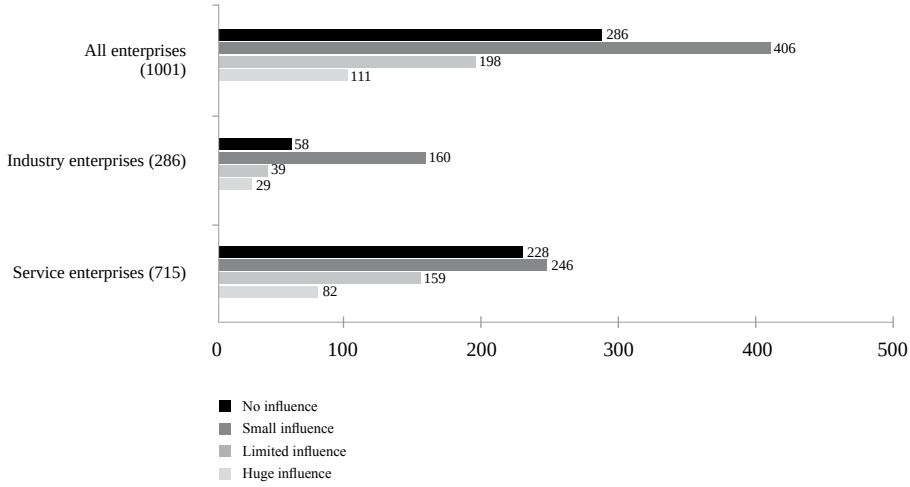

Fig. 11. Role of government in implementation of new technologies

* The question was: What is your opinion about governmental influence on establishment and implementation of technologies in your enterprise?

Due to an insufficient role of government in implementation of new technologies, the companies indicated that they finance new projects from their own funds (67%) and from the EU funds (28%)*. Only 12% of all respondents indicated governmental funds as the financial source of new projects (Fig. 12). The responses of industry companies and service companies allow indicate similar tendencies. To conclude, venture capital and innovative financing remains unaddressed issue nowadays.

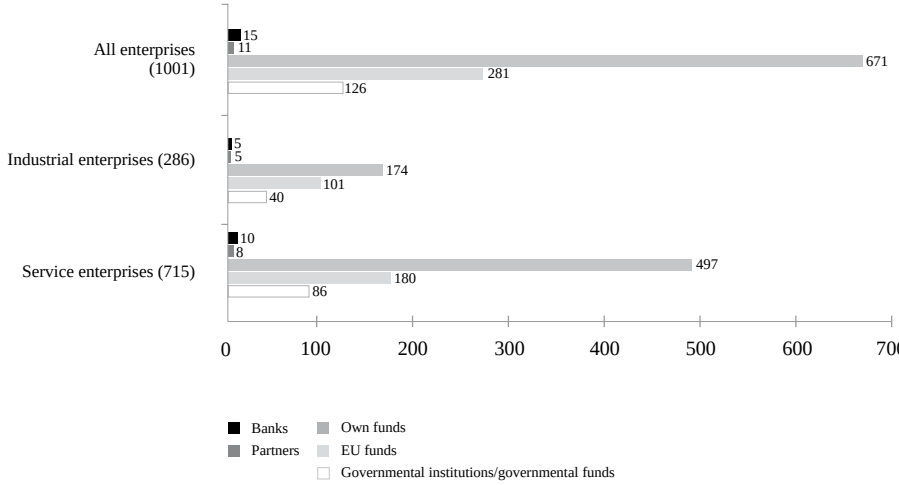

Fig. 12. Financial sources of new technologies

* The question was: Where would you apply for financing of the project?

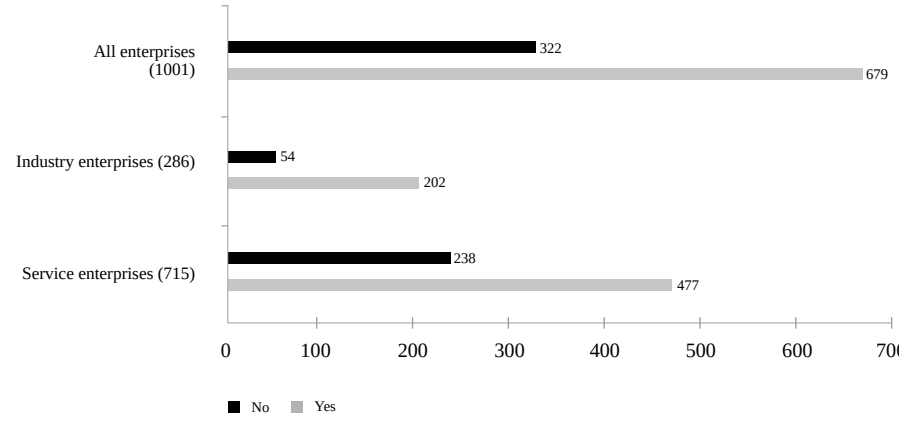

Fig. 13. The information available to companies about governmental innovations programmes

* The question was: Do you know anything about governmental innovations programmes?

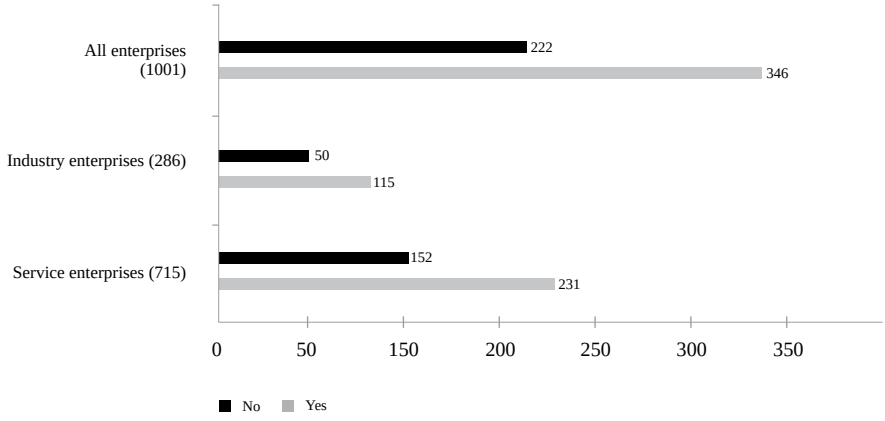

Fig. 14. The benefit of governmental innovations programmes

* The question was: Do you believe in the benefit of such programmes?

68% of all respondents indicated that they have information about governmental innovations programmes* (Fig. 13). Such information is available to 70% of industry companies and 66% of service companies.

However, only 35% of all respondents indicated that they believe in the benefit of such programmes* (Fig. 14). This answer indicated 40% of industry companies and 32% of service companies.

The connection between the business sector and the government is seen as weak. The majority of the companies which participated in the survey indicated this statement (51% of all respondents) (Fig. 15). This statement has been chosen by 58% of industry companies and 50% of service companies.

5. Conclusions

In recent years, the economy of Lithuania has been developing at an almost stable rate. This GDP growth was achieved mainly by traditional business sectors. However, taking into account global trends of economies' slowdown, most likely, in the near future not traditional, but innovative industries will serve as driving forces of the economic growth. Meanwhile, Gross domestic expenditure on R&D in Lithuania appears to be too low. Taking into account that major share of those R&D accounts to the state, increasing the latter's efficiency and initiating private spending on innovations arise as the most urgent issues, tackling of which, would let to narrow the existing gap between Lithuania and other countries in the field of innovative activities.

Insight into more than 1000 business companies shed light on perception of driving and retarding forces impacting innovative activities of industrial and service enterprises. Surprisingly, despite of differences in business specifics, companies engaged in different economic

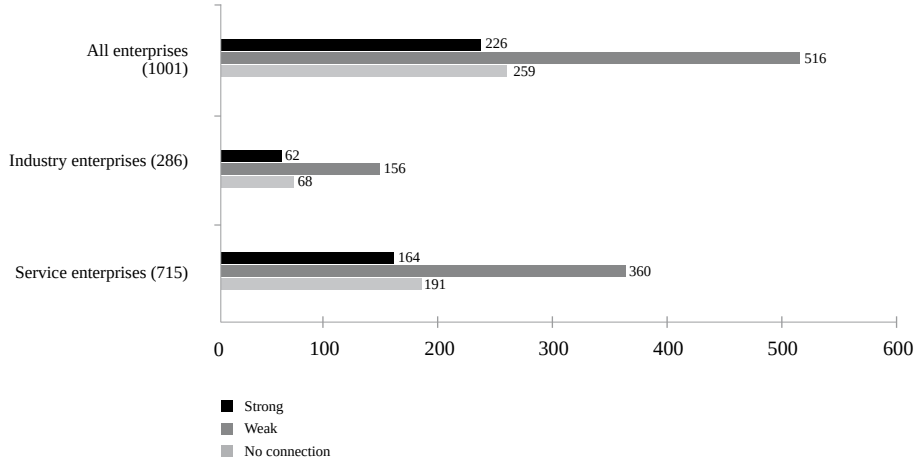

Fig. 15. Connection between business sector and government

* Formulation of question was: How strong, in your opinion, is the connection between your business sector and government?

activities displayed a relative opinion unanimity. The survey indicated that competitive business environment serves as the main driving force of innovative activities development. Business companies do not feel the effects of an active state policy in the innovation fostering field, and, in general, are not aware of available state and other external sources of financing. Obtained results suggest that state policy tools have to be urgently reconsidered.

It appeared that business companies in Lithuania lack educated know-how susceptible employees and perceive it as innovations implementation retarding factor. The issue is partly related to the presented in the paper tendency of brain drain. On the other hand, education system, consuming the major share of state R&D expenditures, but being not able to react to changing needs of business companies should be critically evaluated.

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LIETUVOS ĮMONIŲ POŽIŪRIS Į INOVACINĘ VEIKLĄ DABARTINIO VYSTYMOSI SĄLYGOMIS

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Santrauka

Straipsnio tikslas – atskleisti Lietuvos įmonių požiūrį į inovacinę veiklą. Siekiant atsižvelgti į specifines šalies sąlygas, pateikiama Lietuvos ekonomikos apžvalga, daugiau dėmesio teikiama emigracijos ir nedarbo tendencijoms, pateikiama statistinė inovacinės veiklos ir šalies inovacijų politikos apžvalga. Pagrindinius veiksnius, lemiančius inovacijų kūrimą Lietuvos verslo įmonėse, padeda atskleisti atsitiktinai pasirinktos 1001 įmonės apklausa. Ši apklausa parodo, kaip įmonės reaguoja į veiksnius, skatinančius ir ribojančius inovacijas, kaip vykstant inovacinės veiklos procesui įmonės vertina valstybės inovacijų politiką. Gauti rezultatai leidžia daryti išvadas apie įmonių reakciją į specifines ekonomines sąlygas bei kvalifikuotos darbo jėgos pasiūlos ir paklausos lygį.

Reikšminiai žodžiai: inovacijos, verslo įmonės, Lietuvos ekonomika, valstybės politika.

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