

INNOVATION IMPLEMENTATIONS PROBLEMS IN LATVIA

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Abstract: This paper is devoted to research of newest complex tendencies of innovation and business climate in Latvia and EU. The main goal of this paper is to give evaluation of the current situation, tasks and development trends. In Latvian industrial low value added branches are dominated. Various studies show that the economy is changing stereotypes, when the driver becomes the most significant creative ideas, knowledge and ability to reinvent. Basis for further successful economic development lies in the innovative development model, which is an important competitive factor in the crisis. Standard quantitative methods for economic science research are used in elaborating this work including analysis, and statistical methods, we estimate the correlation between export-based companies and innovation level. We expect that innovation level of the companies is crucial for export activities and country's growth. The applied methods allowed authors to analyze the previous development of industry, to analyze the current situation and forecast the possible prospective changes of the economically active enterprises and the factors influencing them.

JEL classification: O31, P24, F43

Keywords: innovation, production branch, knowledge management, GDP, innovation scoreboard

Reikšminiai žodžiai: inovacijos, gamybos šaka, žinių valdymas, BVP, inovacijų indikacijos.

1. Introduction

Latvia's economic development and high social prosperity level depends on the ability to create and encash competitive goods and services. Latvia's development in the united European market contributes to intensification of competition and resource optimization. Latvia's development trends indicate that the current course of development is not optimal. Recent studies concern the relationship between innovation and successful export market demand, and generally it finds a positive linkage (Wakelin, 1998; Lachenmaier and Wobmann, 2006). Blind and Jungmittag (2004), for example, examine the effect of exporting on innovation among 2,019 German service companies

and find evidence that being an exporter is strongly correlated with the probability of being both a product and process innovator.

The subject of the paper is innovation effects on country's growth, and the aim of the paper is to identify innovation role for the country performance in international trade. Particularly, authors analyze the role of innovation in stimulating GDP and country manufacturing levels using panel data for small open economy—Latvia. We suggest that influences of innovation expenditures are very crucial for overall country performance.

In the first part we are analyzing current situation with innovation implementation in Latvia, then in terms of government policy planning we are discussing government initiatives concerning innovation issues and sustainable development requirements. Firstly, we observed the proportion the share of high-tech products in the industry. Our main emphasis in the paper is on innovation, in terms of the proportion of post innovation return, country overall innovation levels index and individual company's innovation capability. Mainly we concentrated on such data as distribution of manufacturing industries by their value added and trends of industrial development.

We use empirical research based on data from several sources in order to concentrate our main focus on the effect of an innovation inputs (expenditures) against outputs in the overall country performance and development of industrial branch in Latvia. The key result which rises from the estimation may come from evident of positive and significant export market effects based on scale and success of innovation activity. We present the model for our empirical approach based on idea that an innovation or knowledge production function used in the knowledge transformation process, and investments (inputs) are expected to gain significant positive post-innovation returns for government overall performance.

2. Situation analysis

Despite the success achieved for the past years of growth and prosperity of citizens, economic development is among the lowest in the EU, according to EUROSTAT data, using artificial currency, (Purchasing Power Standard i.e. PPS) GDP per capita is smallest among the top 27 EU countries, only next to Romania and Bulgaria [Eurostat]. The economic crisis has raised many significant economic and legislation problems. Latvia's industry is dominated by branches with low value added, i.e. processing of natural resources and the use of cheap labour (Figure 1). The share of high-tech products in the industry is 3-4% and its export does not exceed 6%, while in most of the developed countries it is around 30%. The number of employed in high-tech enterprises is 4.4% of the workforce, while in the EU this figure is 11% [CSB].

Private funding of scientific research/studies decreased, since the majority of Latvian companies in terms of size are classified as micro-enterprises, which limits their ability to fund research. For the period of 2008 in Latvia no more than 0.61% of GDP was spent on science, while for example in Sweden the costs were 3.82%; Finland

3.47%; Germany 2.51% of the GDP [CSB & Eurostat]. Financial funds, which are allocated for science from the European funds and distributed through the Latvian government, are not being developed fully due to the inefficient organization of the innovation process, lack of creative research personnel. Comparing other funding trends it can be seen that financing in the public sector (funding of public and higher education sector) is 0.3% of GDP (the EU average is 1,93%), private sector financing is 0.16% of GDP (the EU average is 0,73%) and foreign funding, including the Structural Funds, is 0,15% of GDP. According to the Central Statistical Bureau of Latvia only 19.5% of enterprises in the period of 2006-2008, were active in the field of innovations [CSB & Eurostat].

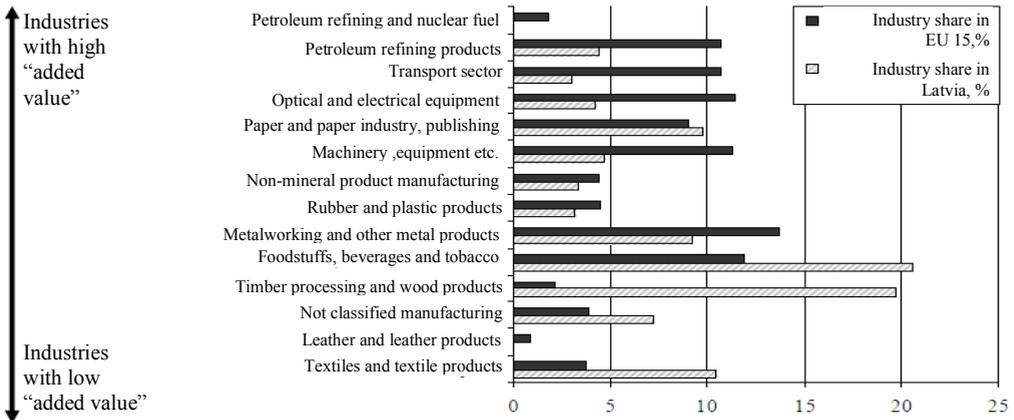


Fig. 1. Distribution of manufacturing industries by their value added.

These trends of industrial development may indicate deindustrialization, i.e. reduction of the role of industry. For example, in comparison to year 1991, the share of industry has significantly reduced in the favour of services. The role of services in value added has increased to 74.8% of GDP in 2006, compared to 38.6% in 1990. [Macroeconomic situation in Latvia]

Latvia lacks goods and services with high value added. The basis for further successful economic development lies in the model of Latvia's innovative development, which is an important competitiveness factor in the times of crisis. In this regard, the question of funding of this direction arises. During the period of 2004 and 2006 Latvia had the first opportunity to gain the support of the EU structural funds. The Cabinet of Ministers of Latvia has approved legislative program "Entrepreneurship and Innovation," as well as the National Program of innovation, which was merged into the Program of Competitiveness and Innovation 2007-2013. The program continues the legally signed Lisbon treaty, which includes the main areas of economic development of Latvia.

A number of legislative documents, based on this study, is aimed at improving the legislative procedures and reducing the administrative barriers, has been adopted in the form of legislative actions in 2010. At the moment there is a change to the basic strategy of the EU 2020 on "INNOVATION UNION." EU directive—SEC (2010) 1161

is taken into account, which basic principle is based on a strategic approach to innovation, aimed at simplifying of legislation acts and administrative barriers to innovation.

An access to funding and improvement of development process standards. This directive is crucial, because the innovation rating (second only to Bulgaria) and the rating of the business environment in Latvia, according to the World Bank data, shows a low ranking of innovative and entrepreneurial climate. (Fig. 2)

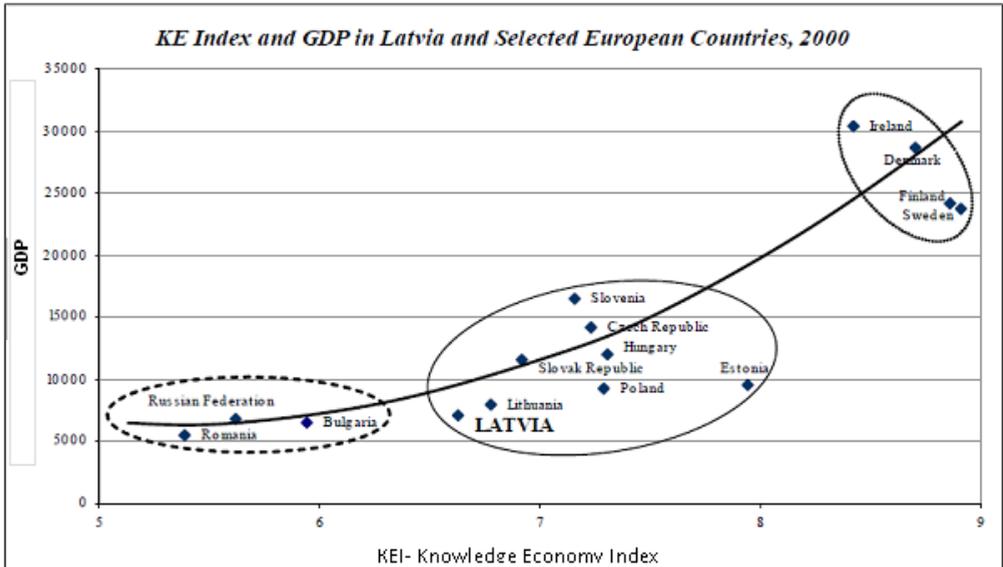


Fig. 2. World Bank Knowledge Economy Index and GDP. KEI index in Latvia and elsewhere in 2000

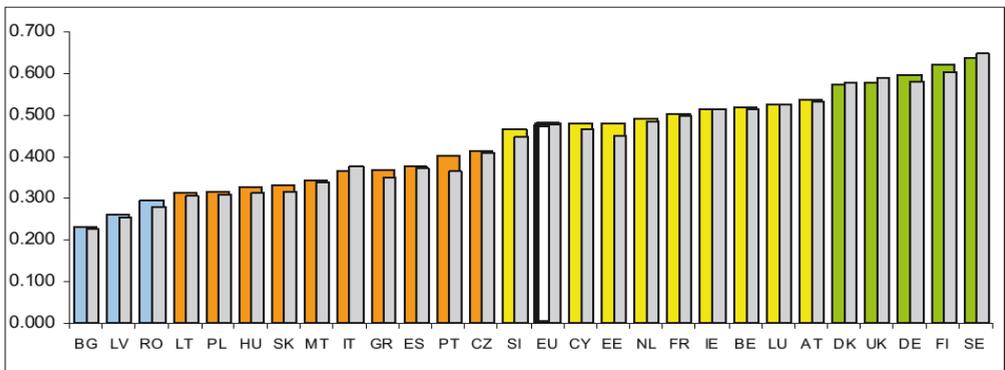


Fig. 3. European innovation scoreboard of 2009 (SII-summary innovation index). General European Innovation Scoreboard index (EIS), 2009.

Latvia’s economy is growing rapidly—GDP over the past five years has increased by 9,4% [CSB]. Yet in general Latvian economy is not in a transition from the production and export of resource-intensive and labour-intensive goods and services to

the production and export of goods and services, creation of which involves sufficient amount of knowledge and creativity to be invested in the process. (Figure 3)

Economic growth is mainly driven by wage growth, which raises twice as much as the increase in productivity. In 2006, real wages increased by 15.5% and the productivity by only 7% [UN/DESA/Development Policy, 2007]. According to economists like Jeffrey Sachs (Jeffrey Sachs) and Xavier Sala-i-Martin (Xavier Sala-i-Martin) the current stage of development of the Latvian economy is characterized by a focus on efficiency, not innovation [CSB, 2007a]. Such structure of the economy cannot provide stable development of the small economy in the long term. Latvia has significantly lagged behind in creating new technologies, while more and more countries—EU, U.S., Japan, China, India and others competing in the development of technology. Therefore it is necessary for Latvia to create new networks of cooperation, in order to integrate technology and new innovative services already established in other countries. Given that in the future, the main competitive factor is not the creation of knowledge and technology, but the ability of their integration in the provision of services [World Economic Forum, 2006]. Latvia has developed informal social networks. Population trusts them, and rely on them more than in any other European country. For example, if there was a need for financial assistance, 47% of the Latvian residents would have relied on relatives or friends, but in Europe only 29% [Eurobarometer, 2005]. At the same time the level of mutual trust of people is low—only 15% of all the Latvian residents trust the majority of people, while in the EU this number is around 25-30% [Eurobarometer, 2005]. This is also reflected in the low establishment rates of new companies—in 2002, per 1000 residents were only 18.3 new companies, which compared to EU member states (51) is a significantly smaller figure [Policy on Small and Medium enterprises].

The atmosphere of distrust and lack of cooperation is demonstrated by what people choose as a source of funding in order to start a business. To start a business 11,9% use bank loans, and 23,2%—support of family and friends, which indicates a low desire of both informal and formal networks to take the risk of entrepreneurial activity. Small social capital creates more risk and financial burden of the new entrepreneur, making entrepreneurship a “deluxe” sort of activity (59,8% Businesses use personal assets) [CSB, 2007a]. Culture of individualism hinders cooperation and inhibits the development of entrepreneurship. Studies show that 69% of entrepreneurs believe that business is suffering from non-paying or late-paying customers and 65% of entrepreneurs consider an availability of short-term credit as such factor, 63%—matchmaking [CSB, 2007a].

Latvian enterprises, in their activities, are mainly oriented on the local network. Only 5.5% of Latvian companies provide services or sell products outside of the EU, 11,1%—in the EU, and 83,4%—only in Latvia [CSB, 2007a]. This means that Latvian businessmen are unable or unwilling to break into to the markets of other countries, even though those businesses that have succeeded, have managed to find small niches, even in the markets which are more and more dominated from Asian companies.

Asia was the most to gain in the recent increasing globalization. Its growth rates are almost five times greater than that of Europe. Over the past 5 years China's GDP grew by 10.2%, India's—by 8,3% [UN/DESA/Development Policy and Analysis Division,

2007]. Asian market was in the focus of many international companies, but the network of international representatives of the Latvian Investment and Development Agency (LIDA), which aims to promote cooperation among international businessmen and Latvia's exports, is not represented in Asia. This market consists of only 4.9% of Latvian exports [CSB, 2007a], that generally indicates that the market in Asia is not in a priority of export policy, which also means that Latvian companies cannot benefit from the development of other countries, particularly in Asia.

Asian cultural authority in the EU is a deficit—only 2% of the EU residents believe that knowledge of Chinese language can be significant for the career and personal growth, 68%—knowledge of English, 25% —French, 22%—German [Eurobarometer, 2005]. Low interest in the cultures of Asia is also seen in Latvia.

It is important for Latvian enterprises to develop a competitive orientation towards foreign cultures and proper jurisdiction to establish international cooperation networks that will benefit from the development of other countries. New foreign cultures jurisdiction offers new opportunities for arbitrage profits in emerging markets. For example, not to invent, but to adapt successful Internet products, that are created in the U.S. and Europe, for users in China [The Churchill Club, 2007].

Cooperation is necessary in order to develop industries that use new communication channels—Internet, mobile technology communications, digital television, as well as other future technologies for the creation of new communication platforms. Development of these industries will create more rapid and convenient access of companies to the global markets. Many companies have social networks, for example, Google, Myspace, Facebook, only in several years, starting with tiny initial investment and using the existing capabilities of the Internet technologies, grew up to become companies which are worth up to \$10 billion [Forbes, 2007].

Currently, more and more cities and states are investing into creation of their brands, as well as brand awareness. In the future brands of states and cities will be one of the most significant assets of competition for incoming tourist flow and investments, new export markets as well as political influence [Copenhagen Institute for Futures, 2003]. Brands already create additional opportunities for enterprises to raise prices on the products and services, if the user's association with the place of origin influences the apparent value of the product or service. Since the creation of brands can contribute to more rapid development, policy makers need to agree on their choice of development—the rapid development of cities or balanced regional development with a choice of branding cities or the state.

In terms of policy planning, the state responded to the initiatives of international politics, thus showing a high ability to respond in terms of action policy.

Requirements that are necessary for cooperation are implemented quickly; nevertheless planned changes in the industry are fragmented and declarative. Goals do not become effective policies. To ensure successful sustainable development the state needs to keep speed tempo in the planning process of existing policies; to expand branch understanding of sustainable development and establish cooperation networks on both international and local levels.

Since the restoration of statehood, Latvian state has gradually moved from short, intuitive ad hoc decision-making to understanding that making decisions must be a deliberate process, predicting future scenarios, weighing the benefits and costs in the short, medium and long term.

As well as a long-term perspective, the concept of competitiveness and sustainable development entered in the Latvian system of planning under the influence of international commitments and planning practices. The concept of sustainable development in the Latvian public space appeared only around 1995 and its increased use is observed only since 2000. Sustainable development is most often seen declarative as a question of environment and natural resources quality; as a problem of a single ministry, not reflecting in planning policies of other branches. Short-term interests and desired solutions do not correlate with the dynamics of the state budget. In general, a reflection of sustained development in the current practice of planning policy can be viewed as a tribute to the initiatives of international politics, which do not have actual enough content for Latvia.

The desired transition of the national economy to alternative technologies of energy consumption, and the promotion of the way of life in the community, which is based on sustainable development, requires a lot of time, so governance initiatives should inherit long-term measurements and mutual continuity. In order to achieve improvements in the quality of life; reduce depletion of natural resources and achieve sustainable economic development, it is important that sectoral planning would be synchronized with and presented to the corresponding social groups. In conclusion, long-term initiatives that relate to greater public prosperity and the implementation of infrastructural support must be coordinated with the budget expenditures. Otherwise, the desired will not become reality.

In the foundation of Latvian national economy growth lies an unstable, traditional and reacting to consumption, model of economic development, rather than the desire to go past ahead of trends, modelling alternatives, the choice of sustainable growth and consumption. Existing competition and unequal position between the competitiveness of economy, social inclusion and environmental sustainability goals, leads to the fact that experience of policy planning, arguments of economic competitiveness prevail over the principles of sustainable development [Sustainable Development: EU Strategy, 2009].

The current public administration's view of sustainable development's sectoral nature and mutual autonomy in spheres of planning and policy implementing, does not contribute to the governments leadership in the transformation of the economy. Therefore, the state at the local level, as one of the leading creators of services, and contractor must establish a precedent of sustainable development that creates and promotes the culture of sustainable national economy and consumption that are not only words, but also practice. If the state's policy of sustainable development is equally demanding in relation to its social order and in relation to business models and lifestyles, that this sequence will promote loyalty in those sectors of society, where consumption, which corresponds to sustainable development is only associated with "unnecessary costs."

Currently Latvia has no interest and is not ready to receive economic benefits from the rapid development of countries in Asia. Among other EU countries, Latvia sees its future economic competitiveness in the development of the knowledge economy, where the main role is assigned to science and technology. Therefore, along with economic orientation towards the East, it is necessary to estimate Latvia's opportunities for development and implementation of technology, human resources as also collective capabilities of the EU's competition with China and India.

In cooperation with employers and other social institutions, the state needs to estimate, which of the competitive market's niche Latvia could hold, in relation to EU and Asia. To succeed in sustainable development of Latvia, it is necessary to determine which competitive cultural orientation and competence are necessary to develop educational and cultural institutions in the long-term? And also, what representative network should be created in order for Latvia to be fully merged into global economy and what will be Latvia's competence niche in relation to other EU countries? Taking into account current trends of development and proportional risks, the state could share some risks with entrepreneurs and educational institutions, trying to become a part of the Asian market in service product and talent preparation.

If predictions about the Asia's development pace are true, than the state and the majority of the population will have to overcome the illusion of Europe's superiority as the centre of development, and pro-activity will be rewarded. Those countries, which will quicker acknowledge a possibly new geopolitical world order and will develop Asian cultural competence, will be able to receive more from the new geopolitics.

3. Data and Methods

Our empirical analysis is based on data from several sources: the European Innovation Scoreboard (EIS), which provides information on the innovation activities; the World Bank KEI knowledge innovation index which provides information on knowledge; value added data in manufacturing branches of OECD countries from the Eurostat Database; and, value added data for Latvia from CSB (Central Statistical Bureau) and overall country performance from Ministry of Economics.

The European Innovation Scoreboard developed under the Lisbon Strategy to provide a comparative assessment of the innovation performance of EU Member States. The analysis is based on a set of internationally comparable indicators covering the different aspects of innovation performance. Statistical data on private funding of scientific research/studies were also included in our research.

First, we observed the proportion the share of high-tech products in the industry. Of course GDP per capita was also included in our analysis among 27 EU countries. Mainly we concentrated on such data as distribution of manufacturing industries by their value added and trends of industrial development. The important factor as expectations from entrepreneurs, and export/import proportions we reviewed.

4. Estimation results

Our main focuses were concentrated on the effect of an innovation inputs (expenditures) against outputs in the overall country performance and development of industrial branch in Latvia. Starting from the 1990s till nowadays. The innovation indicators for Latvia suggested downward trends.

Overall economic performance growth rates in Latvia were declining more rapidly while the others countries' economy were recession. These contrasting situations provide an ideal example in which to compare the influence of macroeconomic effects with the innovation performance.

The key result which rises from the estimation may come from evident of positive and significant export market effects based on scale and success of innovation activity.

Latvia experienced massive foreign direct investment during our study period. Growth and innovation in the Latvian economy over this period was not therefore driven by changes in export demand but rather by investment-led growth as foreign investors trying to gain market share in Europe and Middle-Eastern markets after 1990s Latvian independence. This crucial fact shapes the importance of supply-side factors rather than market demand measures in describing Latvian innovation performance over this period.

Looking at the results we see first a positive size effect on the probability of the innovation involved in produced products & services and processes on performance. Second, we see the anticipated strong positive effects from insufficient R&D activities and knowledge level, as expected, on increased probability of less competitive power.

5. Innovation Model

Our conceptual approach is based on idea that an innovation or knowledge production function which models the knowledge transformation process by which knowledge made from R&D are translated into innovation outputs (Roper et al., 2008). Investments in R&D will take place when the results of these investments (i.e. innovations) are expected to gain positive post-innovation returns. Decision-theoretic models based on choice to research (e.g. Levin and Reiss, 1984), for example, suggest to relate company's investments in R&D positively if expected high innovation results.

That is, the company's R&D expenditure intensity will be given by:

$$\text{R\&D}_{\text{expenditure level}} = a_0 + a_1\text{ExM (ExportMarket)} + a_2\text{DME (DomesticMarketExpectations)} + a_3\text{KF(KnowledgeFactor)} + a_4\text{EIS (EuropeanInnovationScoreBoard)} + a_5\text{KEI (KnowledgeEconomyIndex)} + n$$

Otherwise:

$$\text{R\&D}_{\text{expenditure level}} = a_0 + a_1\text{ExM} + a_2\text{DME} + a_3\text{KF} + a_4\text{EIS} + a_5\text{KEI} + n \quad (1)$$

Entrepreneur expectations of post-innovation returns, are likely to describe their experience of growth in their domestic (DMEi) and export (ExMi) markets as well as the market position of the company itself, and other company and industry specific factors.

Where, KEI and KF represents the availability of common knowledge, EIS is a series of indicators of the strength of potential industry innovation which might positively affect post innovation returns.

Innovation outputs will then be calculated by the innovation production function (Geroski 1990), reflecting the company's R&D investments, other knowledge sources and any additional factors which may regulate the effectiveness of company's knowledge transformation activities into post innovation results. If I is an innovation output indicator we can write this:

$$I = b_0 + b_1 \text{R\&D}_{\text{expenditure level}} + b_2 \text{KF} + b_3 \text{EIS} + b_4 \text{KEI} + n \quad (2)$$

Here, the coefficients will represents the innovation impact on growth. As we expect R&D investments to be positively related on expected post innovation revenue or turnover (overall performance), and innovation to be positively related to R&D expenditure.

We consider these coefficients to reflect the possibility that innovation responds to market acceleration and deceleration.

The coefficients on KF will reflect both the indirect effect of KF on $\text{R\&D}_{\text{expenditure level}}$ as well as the direct impact of other knowledge sources on innovation outputs (i.e. b_3, b_4).

In the previous one—the sign of a_3 in equation (1)—will reflect the complementarity or substitute nature of R&D and other external knowledge sources.

In the models we include some others variables; an indicator of the level of graduate skills in the management of the company (director education level); an indicator of the proportion of the workforce involved in hi-tech production companies and etc.

Finally, we also include a special dummy variable (e.g. a_0) reflecting company subjective assessment of whether they faced financial barriers to engaging in successful innovation (e.g. it may be necessary to include also World Bank rating “Doing Business” concerning business environment favourable factor). Concerning the World Bank rating “Doing Business” determined barriers variable we expect negative signs direct and indirect effects.

We expect more information in terms of a positive relationship between innovator skill levels (proportion of highly educated directors in country economy) and R&D investments.

Various studies show that the economy undergoes a change in the stereotypes, when the economy is driven mostly by creative ideas, knowledge and ability to invent [IMD Business School 2007, Landry, Charles, 2000]. George Cox's report, commissioned by the State Treasury of Great Britain, defines creativity as the generation of new ideas or creating new ways to look at existing problems, for example, using new technology or changes in the markets [George. Cox, 2005]. The concept of creativity

is no doubt closely linked with innovations, which is a successfully implementation of the above mentioned ideas, transforming them into new products, services, innovative management of the company or even a new form of entrepreneurship [George. Cox, 2007]. Creativity as an engine for development is combined with recent philosophy of sustainable development. Because the number of available natural resources in the world is limited, it is important not to drain the existing resources, but to look for the new ways of using them.

As the researchers of the Copenhagen Institute for Research of the future emphasize competitiveness of Europe must be sought not in a desperate competition with the U.S., Japan and Asia, but in European culture, which appreciates the desire of creativity and experimentation [Copenhagen Institute for Futures Studies, 2003b]. Comparing by such indicators of innovative industries—the number of registered trademarks and design—the EU has been more successful than U.S. and Japan [EU innovation gap with US and Japan, 2005]. In this regard, it is important to consider the situation in Latvia in respect of creativity and innovation, i.e. the industries with intensive human resource and their ability for sustainable development.

6. Conclusion

Our main conclusion describes that in terms of the innovation, and in terms of the proportion of post innovation return, countries' overall innovation levels index as well as individual company innovation capability are playing crucial role. In particular, our results suggest that Latvian economy dramatically anticipated effects of world recession more than other countries, because of innovation level. Companies with low post-innovation returns and weak innovative competitive position have a lesser chance to reply in stress situation. Restructuration and adaptation against impact is important. Where find positive effects of innovation for other countries as they have stronger trends for the growth in export market demand.

From both country policy and strategy perspective the relative strength of country capability in innovation are suggesting that measures to improve country innovation capability can generate improvements in overall performance regardless of market conditions.

From a strategy point of view, this suggests that company's innovation outputs are largely strategically determined by innovation levels and knowledge sources available proving important innovation level.

From a policy perspective these results emphasize the potential benefits for innovation outputs based on development of companies internal knowledge and its successful transformation powers (creativity and skills).

As a first step of our research, there is not yet clear from our modelling is whether these innovation effects were occurred primarily through their indirect effects from post innovation returns, or directly from companys' knowledge transformation powers. There are not yet approved direct correlation between these factors. As limitations in our data

we were unable to identify which specific innovation index is critical, and we are therefore forced to use a more generalized indicators presented by authority institutions.

References

1. Axel Olesen, Søren Riis, 10 tendencies towards 2010. Members' Report 4/2003. Copenhagen Institute for Futures Studies. Database [online] [accessed 30 September 2010], <<http://www.cifs.dk/scripts/artikel.asp?id=1008&lng=2>>.
2. Blind, K. and A. Jungmittag (2004). Foreign direct investment, imports and innovations in the service industry. *Review of Industrial Organisation* 25, 205-227.
3. Centrālais Statistikas birojs CSB [online] [accessed 1 November 2010], <<http://data.csb.gov.lv/Dialog/varval.asp?ma=03>>.
4. Centrālais Statistikas birojs. CSB [online] [accessed 5 November 2010], <<http://data.csb.gov.lv/DATABASE/zin/Ikgad>>.
5. Centrālais Statistikas birojs CSB (2007a). Pastāvīgo iedzīvotāju nacionālais sastāvs gada sākumā. [online] [accessed 10 October 2010], <<http://data.csb.gov.lv/DATABASE/Iedzsoc/Ikgadējie%20statistikas%20dati/Iedzīvotāji/Iedzīvotāji.asp>>.
6. Centrālais statistikas pārvalde. CSB (2007a). Uzņēmējdarbības veiksmes faktori Latvijā. Apsekojumā rezultāti.
7. Cox, George. Cox Review of Creativity in Business. (2005).
8. Cox Review of Creativity in Business: building on the UK's strengths. [online] [accessed 23 October 2010], <http://www.hm-treasury.gov.uk/independent_reviews/cox_review/coxreview_index.cfm>.
9. Eurobarometer. (2005). "Social Capital," Special Eurobarometer [online] [accessed 11 September 2008], <http://ec.europa.eu/public_opinion/archives/ebs/ebs_223_en.pdf>.
10. Eurostat data base [online] [accessed 4 November 2010], <http://epp.eurostat.ec.europa.eu/cache/ITY_PUBLIC/2-21062010-AP/EN/2-21062010-AP-EN.PDF>.
11. Forbes journal [online] [accessed 02 November 2009], <http://www.forbes.com/entrepreneurs/2007/08/09/google-yahoo-youtube-ent-fin-cx_kw_0809whartonvc.html>.
12. Garelli, Stéphane. (2007). The Competitiveness Roadmap: 2007 – 2050. IMD Business School. [online] [accessed 15 October 2010], <http://www.imd.ch/research/publications/wcy/upload/roadmap_A3.pdf>
13. Geroski, P. A. (1990). Innovation, Technological Opportunities and Market Structure. *Oxford Economic Papers*: 586-602.
14. Lachenmaier and Wobmann (2006). Does innovation causes exports? Evidence from exogenous innovation impulses and obstacles using German micro data. *Oxford Economic Papers* 58, 317-350
15. Landry, Charles. (2000). *The Creative City: a toolkit for urban innovators*. UK: Comedia.
16. Landry, Charles. (2007). A short guide to the Creative City and a touch more. Unpublished thought paper for the British Council project Creative cities, May 2007.
17. Levin R and Reiss P (1984) "Tests of a Schumpeterian model of R&D and market structure" in Z Grilliches (ed) *R&D, Patents and Productivity*, University of Chicago Press.
18. Macroeconomic situation in Latvia. Pārskats par situāciju Latvijas tautsaimniecībā. Ministry of Economics [online] [accessed 02 November 2010], <http://www.em.gov.lv/em/images/modules/items/item_file_17552_emprog_p3.doc>.

19. Mogensen, Klaus Æ., Kåre Stamer Andreassen, et. al (2004) Copenhagen Institute for Futures Studies. Creative Man.
20. Policy on Small and Medium enterprises. Latvijas Republikas Ministra kabinets. (2003). Latvijas Mazo un vidējo uzņēmumu attīstības politikas pamatnostādnes.
21. Roper, S., J. Du, J. H. Love (2008). Modelling the Innovation Value Chain. *Research Policy* 37, 961–977
22. Sustainable Development: EU Strategy [online] [accessed 07 November 2009], <<http://www.euractiv.com/en/sustainability/sustainable-development-eu-strategy/article-117544>>.
23. The Churchill Club. (June 14, 2007) No Plan, No Capital, No Model...No Problem: Companies that Defied What VCs Will Tell You. [online] [accessed 23 April 2008], <http://www.churchillclub.org/eventDetail.jsp?EVT_ID=739>.
24. Trendchart. (2005). EU innovation gap with US and Japan. [online] [accessed 23 September 2010], <http://trendchart.cordis.lu/scoreboards/scoreboard2005/gap_with_US.cfm>.
25. UN/DESA/Development Policy and Analysis Division. (2007) Project LINK Estimates. [online] [accessed 20 October 2010], <<http://www.un.org/esa/policy/>>.
26. Wakelin, K. (1998). Innovation and Export Behaviour at the Firm Level. *Research Policy* 26, 829-841
27. World Economic Forum. (2006). The Global Competitiveness Report 2006-2007, New York: Palgrave Macmillan, sk. 01.09.2010.

INOVACIJŲ ĮGYVENDINIMO PROBLEMAS LATVIJOJE

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Santrauka. Straipsnyje autoriai pateikia mokslinių tyrimų rezultatus inovacijų tendencijų ir verslo aplinkos srityje Latvijoje ir ES. Pagrindinis darbo tikslas – pateikti dabartinės padėties vertinimą, nustatyti inovacijų vystimosi tendencijas Latvijoje. Pateikiamas sėkmingos ekonominės plėtros ir novatoriškumo modelis, kuris yra aktualus konkurencingumui didinti krizės metu.

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