

EUROPEAN STRUCTURAL FUNDS ASSISTANCE FOR YOUNG RESEARCHERS IN LATVIA

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Abstract

Latvia is a small country and small open economy and its main and the most competitive recourses are highly educated society and well developed science based on the research, innovation and modern technologies. To create a well functioning innovation system as a part of knowledge-based economy several conditions has to be met to insure that all parts of national innovation system do effectively work together.

Latvia is considered to be a country in transition between efficiency driven and innovation driven economy after Global Competitiveness report 2009-2010. This means that the development of the country soon would not be possible by improving productivity adopting existing technologies or making incremental improvements in other areas. Bigger and bigger role of country's competitiveness will be in its ability to innovate. This means sufficient investment in research and development, the presence of high-quality research institutions, extensive collaboration in research between universities and research institutes as well as technology transfer to the industry, and the protection of intellectual property. As one of the main obstacles that prohibit the scientific activities development in Latvia after restricted amount of funding is the lack of young scientists. The most significant reasons of ageing of scientific personnel are the insufficient number of doctoral students, brain drain of young scientists, the low percentage of research and development personnel (just 0.54% of the labour force in 2008 (Eurostat)).

The aim of this article is to analyse if the problems that accrue in higher education and science because of lack of young human recourse inflow can be solved by interaction of state using the European Union (EU) structural funds assistance.

During the programming period 2004-2006 the five main universities in Latvia implemented projects under the activity 'Improvement of quality and implementation of doctoral studies and post-doctoral research'. The aim of these projects was to improve the quality and implementation of doctoral level studies and post-doctoral research in natural science and technology fields as well as to increase the number of new enrollees in the doctoral studies and provide research grants to the best doctoral students and new researchers. The research shows that the number of matriculated doctoral students in the prior study areas in the universities having implemented such projects has grown for 65.73% over the period of analysed seven years (2003-2009). The study concludes that EU structural funds assistance increases the motivation to start studies at doctoral level and encourage the students to choose carry out research in natural science and technology fields. In order to attract the young scientists to the research institutes the young scientists have to be involved in the research projects and the mentoring approach could be used to gain good results in the alternation of researchers' generations by use of EU structural funds assistance. The research is mainly based on such economic research methods as grouping, chain and basis increase rate calculations. Comparative, analytical and historical methods have been manly used in the paper, taking into consideration the large amount of scientific literature.

Keywords:

EU Structural Funds, ageing of scientists, doctoral studies, national innovation system.

Introduction

Guidelines for Development of Science and Technology, 2009-2013 developed by the Ministry of Education and Science defines low number of people employed in science and research to ensure the country's economic strategy implementation and sustainable growth, reduction in the number of scientists and

aging of scientists, and insufficient number of doctoral students as one of main development problems in the field of science and technology in Latvia.

Latvian National Development plan, 2007-2013, states main three priorities: 1) an educated and creative individual, 2) technological excellence and flexibility of companies, 3) development of science and research. The main problem that is identified and has to be solved

as soon as possible is lack of young and emerging scientists working in Latvian research institutions and the aging of academic personal in higher education institutions. Therefore there are set several tasks to attract young scientists to scientific institutions and to motivate young people to choose a career in science, per example, improve the grant and scholarship system for doctoral studies, create a research support system for young postdoctoral scientists, motivate emigrated Latvian scientists and young experts to return and work in Latvian scientific institutions. The main financial instrument for solving the problem mentioned above is EU Structural Funds.

Latvia as a separate NUTS II region since 2004 is eligible for Objective 1 Structural Funds support. One of the priorities of the Single programming document, that was designed for EU Structural Funds intervention in Latvia for the programming period 2004-2006, was Development of Human Resources and Promotion of Employment. Under this priority the measure "Development of Education and Continuous Training" included activity "Improvement of quality and implementation of doctoral studies and post-doctoral research". The main five universities in Latvia implemented projects under this activity. The aim of these projects were to improve the quality and implementation of doctoral level studies and post-doctoral research in natural science and technology fields as well as to increase the number of new enrolees in the doctoral studies and provide research grants to the best doctoral students and new researchers. Projects were completed in summer 2008 and the EU Structural Funds programming documents for the period 2007-2013 declared European Social Fund grants for master students in natural science and technology field and grants for doctoral students and young researchers in the all fields of research. There are some comprehensive researches that examine if the assistance of EU Structural Funds fulfilled indicators that were set in Single programming document for the programming period 2004-2006 were met, although deeper study on EU Structural Funds support's impact on dynamics of number of new enrolees in the doctoral studies and the number of doctor's degree has to be carried out.

There are several authors in Latvia that have been writing about innovative activities (Boļšakovs, 2008), innovation process and system (Dimza, 2003), knowledge society (Karnītis, 2004), higher education institution's role in economic development (Sloka and Vilciņa, 2009), (Mazūre et.al., 2009), knowledge-based economy (Bikse, 2007). Many studies on the research policy topic are carried out in the world, but there is lack of studies in the field of research policy that concentrate on Latvian national education system as a part of national innovation system.

To create a well functioning innovation system (the example of Ireland's national innovation system see in Figure1) several conditions has to bee met to insure that all parts of national innovation system do effectively work together.

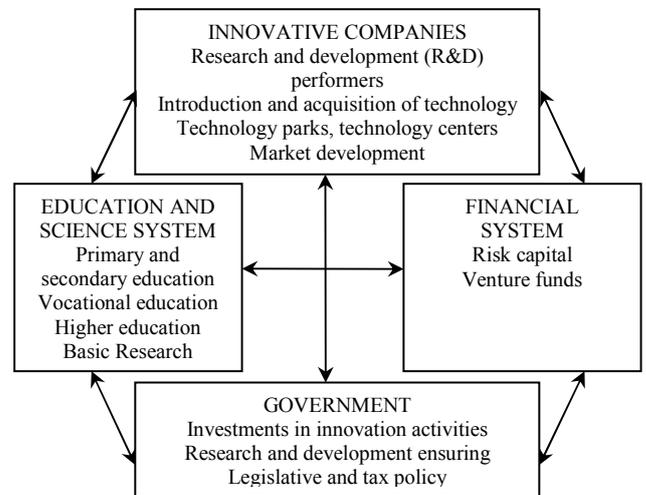


Figure 1. The National innovation system of Ireland

Source: *Science, Technology and Innovation. The White Paper by Government of Ireland. Department of Enterprise & Employment, Dublin, 1996*

The main conditions that ensure effectively working national innovation system are (Dimza, 2003):

- Universities conduct fundamental research at the global level, allowing students to obtain a competitive and internationally recognized higher education. Public and private professional education and vocational institutions train with necessary skills and knowledge, highly qualified and for certain science-capacious industry sectors suitable professionals;
- Producing sector (mainly private) are able to invest in innovation activities and to fund research in the country up to 80% (of total research and development spending in the country);
- The government creates enabling environment for innovation, applying favourable credit policy, tax and customs policy, as well as investment policies in order to make more beneficial the private sectors investments to innovative activities;
- The financial sector, bought public and private, is capable to take the risk and provide financing for innovations.

Vīksne D. in her research concludes that higher education institutions have started activities to involve students and academic staff in the development and promotion of innovative entrepreneurship in the respective region, thus student motivation to stay and start business in their region is created (Vīksne, 2010). The next step towards efficient National innovation system is strengthening of Education and science systems collaboration.

The research performed by Prodan I. and Drnovsek M. shows that greater numbers of years spent at an academic institution hinder the formation of academic-entrepreneurial intentions. Because tenured professorships guarantee academics' basic socioeconomic status, they are less motivated to endanger their research by redirecting interest and energy to business matters (Prodan, Drnovsek, 2010).

Therefore authors of this paper found it topically to analyze ageing of scientific personnel and other problems that accrue in higher education and science due to lack of young human recourse inflow can be solved by interaction of state using state European Structural funds assistance.

The aim of research is to analyse if the problems that accrue in higher education and science because of lack of young human recourse inflow can be solved by interaction of state using the European Union (EU) Structural funds assistance.

To meet the research aim we set research tasks:

- Analyze if using of EU Structural funds assistance in programming period 2004-2006 increased the number of new enrollees in the doctoral studies in natural science and technology fields;
- Study the coloration between EU structural funds support number of young scientists working in higher education institutions and the research institutes of higher education institutions.

Research object is young researchers and doctoral students in Latvia.

The following economic research methods were used for tackling the tasks: grouping, chain increment rate, basis increment rate, graphic illustration. Monographic descriptive method, analysis and synthesis are used in the paper to study the problem elements and synthesize coherencies. Authors studied legal framework in Latvia and scientific publications in research policy, education systems, mentoring in higher education. Induction method is used for summarizing individual facts in general statements, but deduction method for theoretical explanations and logical synthesis of the empirical study.

The analysis of doctoral students and working researchers in Latvia is based on statistical data obtained from Central Statistical Bureau of Latvia, Eurostat and the information included in Reports on Higher education in Latvia (figures, data, tendencies) acquired from Ministry of Education and Science during the period 2003-2009.

All data analysis was performed using the statistical methods. Comparative, analytical and historical methods have been mainly used in the paper, taking into consideration the large amount of scientific literature.

EU Structural funds assistance for young researchers and PhD students in Latvia

Doctoral studies have to provide excellently educated doctors who are able to compete internationally. Not only quality is an issue, but the sufficient quantity of doctoral students is a matter of great importance. Although the total number of students is high – on the 10 000 population it is 554 in year 2007, however, this indicator does not provide sufficient amount of doctoral students and doctors, that could form the new generation of scientists and guarantee continuity in terms of the formation of scientific institutions. The age structure of scientists at higher education institutions and research institutes of the universities is inadequate in long term perspective (Figure 2).

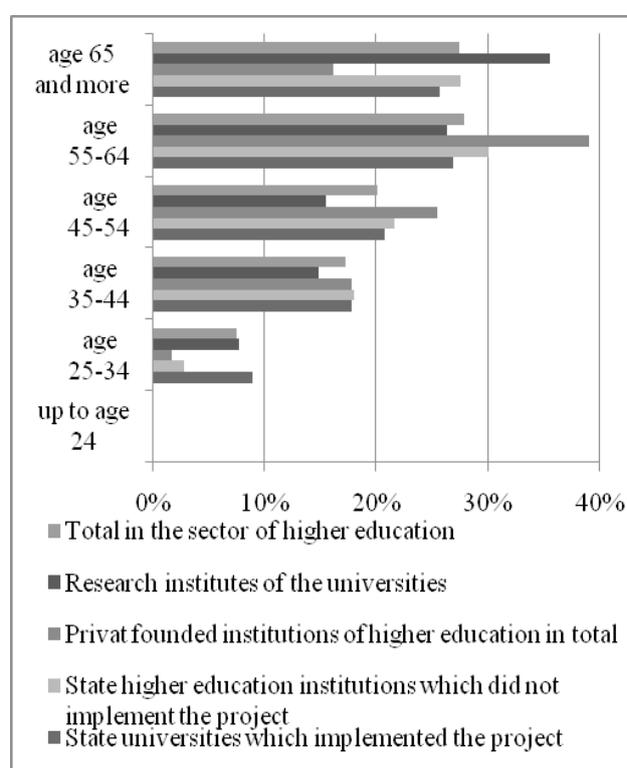


Figure 2. Age structure of scientists at higher education institutions and research institutes of the universities in Latvia, 2008

Source: author's calculations based on the Report on Higher education in Latvia 2009 (figures, data, tendencies)

Only 7% of the total number of scientists working at higher education institutions and research institutes of the universities are under age 35. Only five higher education institutions employ four and more scientists under age 35, but there are only 37 scientists (8%) under age 35 working in research institutes of the universities. The highest number 91 of young scientists works at the University of Latvia and it is 48 percent of all scientists under age 35 in the sector of higher education. The total number of scientists age 65 and more is 697 or 27

percent of all scientists working in the sector of higher education.

The data shows that the highest number of scientists under age 35 are working at higher education institutions which implemented the project under activity 'Improvement of quality and implementation of doctoral studies and post-doctoral research' and research institutes of the universities.

Taking into account the fact that the state budget funding for universities and scientific institutions in the year 2009 has been considerably reduced – scientific institutions, with a reduction of 41%, including science-based funding, which includes scientists wage fund by 52%. Given this fact there is a high risk not only to attract new scientists, but also the employment of scientists in the future.

After analysing available data and the scientific publications, authors deduced the reasons for the small number of doctoral students that could be both with the direct and indirect effects.

Directly impacting factors:

- Proportion of state-funded study places at doctoral level is too low (only 1462 state-funded study places at doctoral level, 31 percent of students are covering study fee);
- High rates of study fee for private-funded study places at doctoral level (from 1350 to 6000 euro);
- Low postgraduate scholarships for doctoral students (114 euro and credit equalized grant 85 euro);
- Low motivation for doctoral studies, which is caused by many indirect factors.

Indirectly influencing factors:

- Old-fashioned infrastructure of higher education institutions and research institutes;
- Low involvement of students in scientific projects at early study phase;
- doctoral studies weak links with research projects held out by research institutes in the universities (Figure 2)
- Low level of wages of academic staff and unattractive remuneration system of scientific personnel;
- Lack of safety factor, that doctor degree holder will be needed in the labour market and would not fall in the risk group as overqualified workforce;
- Remuneration system in public and private sector (the education level does not affect the amount of wage).

The EU funds assistance can help to hinder the influence of direct factors (offer monthly grant of amount 427 euro master level students in the prior study areas, 854 euro for doctoral students, and 1138 euro for doctor degree candidates (last year doctorate students) studying in the all study areas).

There are some EU structural funds activities that are focused on diminishing such indirectly affecting factors of low number doctoral students as old-fashioned infrastructure of higher education institutions and research institutes – activities No. 2.1.1.3.1. 'Development of research infrastructure' (171.5 mil EUR), No. 2.1.1.3.2. 'Improvement of IT infrastructure and IT system for the research needs' (17.6 mil EUR), and activity No. 3.1.2.1.1. 'Modernization of Premises and Devices for Improvement of Study Programme Quality at Higher Educational Establishments, including Provision of Education Opportunities for Individuals with Functional Disabilities' (143.2 mil EUR). Low involvement of students in scientific projects and doctoral studies weak links with research projects held out by research institutes in the universities by implementing European Social fund projects under activity No. 1.1.1.2. 'Attraction of Human Resources to Science' (57.3 mil EUR).

In order to attract the young scientists to the research institutes the young scientists have to be involved in the research projects and the mentoring approach could be used to gain good results in the alternation of researchers' generations. Larose S. et al. study the personal and social support factors involved in students' decision to participate in formal academic mentoring and conclude that the willingness of enhancement in the academic mentoring depends on the student's personality and help seeking habits (Larose S., et al., 2009), therefore there is a place for further research about student's enhancement in the academic mentoring in Latvia.

In order to investigate if the number of new enrollees in the doctoral studies in natural science and technology fields is caused by EU structural funds assistance, authors studied the dynamic time series of the EU structural funds assistance impact on number of students at doctoral level in Latvia during the time period year 2003-2009.

The data in Table 1 shows that the number master's degree gained in reporting year does decrease, but the base increase rate of number of matriculated doctoral students has grown for 47.85 percents. The number of doctoral students enrolled in the prior study areas in the universities, which implemented the ESF project, has grown more (the base increase rate is for 31.15 percent higher in the year 2009) than number of doctoral students enrolled in the not prior study areas. It means that the EU structural funds assistance increases the motivation to start studies at doctoral level and encourage the students to choose carry out research in natural science and technology fields.

Table 1. The EU structural funds assistance impact on number of students at doctoral level in Latvia, 2003-2009

No.	Indicators	Years						
		2003	2004	2005	2006	2007	2008	2009
1	European Social Fund's support for doctoral studies and post-doctoral research	--	102645	1792238	2388695	4736132	2724690	7702569
2	chain increase rate,%	--	0.00	1 646.05	33.28	98.27	-42.47	182.70
3	base increase rate,%	--	0.00	1 646.05	2 227.14	4 514.09	2 554.48	7 404.09
4	Number master's degree gained	3183	3608	3382	3173	3237	2602	2578
5	chain increase rate,%	--	13.35	-6.26	-6.18	2.02	-19.62	-0.92
6	base increase rate,%	--	13.35	6.25	-0.31	1.70	-18.25	-19.01
7	Number of matriculated doctoral students	418	420	530	484	464	619	618
8	chain increase rate,%	--	0.48	26.19	-8.68	-4.13	33.41	-0.16
9	base increase rate,%	--	0.48	26.79	15.79	11.00	48.09	47.85
10	Number of doctoral students enrolled in the prior study areas in the universities, which implemented the ESF project	178	193	231	222	251	304	295
11	chain increase rate,%	--	8.43	19.69	-3.90	13.06	21.12	-2.96
12	base increase rate,%	--	8.43	29.78	24.72	41.01	70.79	65.73
13	Number of doctoral students enrolled in the non prior study areas	240	227	299	262	213	315	323
14	chain increase rate,%	--	-5.42	31.72	-12.37	-18.70	47.89	2.54
15	base increase rate,%	--	-5.42	24.58	9.17	-11.25	31.25	34.58

Source: author's calculation based on the Report on Higher Education in Latvia 2009 (figures, data, tendencies)

Conclusions

To build an effectively working innovation system, it is necessary to establish strong link between higher education institutions, research institutes and industry.

Support of European Union structural funds have positive impact on the development on science and innovations sphere, and it is one of the preconditions for the development of states' competitiveness.

EU Structural Funds assistance in programming period 2004-2006 has increased the number of new enrollees in the doctoral studies whit base increase rate 65.73 percent over the period of analysed seven years (2003-2009) in natural science and technology fields.

EU structural funds assistance increases the motivation to start studies at doctoral level and encourage the students to choose carry out research in natural science and technology fields.

In order to attract the young scientists to the research institutes they have to be involved in the research projects and the mentoring approach could be used to gain good results in the alternation of researchers' generations. There is a place for further research about student's enhancement in the academic mentoring in Latvia.

The government have to increase proportion of state-funded study places at doctoral level up to 100 percent.

Other possibility to increase the number of doctoral students is to raise the amount of credit equalized grant to the EU structural funds level and additional amount

that would cover study fee, keep in force the restriction, that the credit equalized grant has to be repaid if the scholar does not get the doctor degree in five years period after start of studies.

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