Proposals on higher education and research system quality enhancement opportunities

SUMMARY

Issues

I. Studies, students, study programmes, mobility
Recently the number of students has significantly dropped (since 2008 it has dropped by one third), the tendency will remain for the next years only due to further decrease in the number of graduates (due to birth-rate gap it is expected that the number of graduates will decrease by almost one fourth by 2020), yet **the number of higher education institutions remains stable.**
Even though the number of graduates is decreasing and the share of entrants to higher education institutions remains more or less the same, **higher education institutions accept a constantly increasing number of entrants.**
Among the students who were accepted v**ia Lithuania's association of higher education institutions for the organisation of general admission (LAMA BPO) (in 2015)** to the state-funded study places in Lithuanian higher education institutions and those who received scholarships (hereinafter – SF / SCH) **over one fourth** obtained **less than 4 competition scores** (CS)[1]. Over three thirds of university entrants to SF / SCH places received more than 6 scores. Persons admitted to 60 per cent of non-state-funded study places in higher education institutions financed from own funds have received less than 4 scores.
Another 25 per cent of students in state-non-funded are accepted to **not via LAMA BPO**, thus data on their competition scores are fragmental.
At the same time, **the number of study programmes** offered by higher education institutions **is increasing**, and **the number of people enrolled is decreasing**. Currently one fourth of the study programmes have less than 10 students enrolled.
8 per cent of Lithuanian students (based on data of 2012) go to study full study programmes in higher education institutions in 27 EU/EEA/candidate states, **while the EU average is about 3.5 per cent**. The number of individuals **coming to Lithuania** for full-degree mobility from EU 27/EEA/candidate states **makes only 0.2 per cent, while the EU 27 average is 3.6 per cent**.
The number of personnel of higher education institutions who participate in Erasmus programme and go to work abroad is 1.5 times higher than those coming to work (based on data of 2013-2014).
II. Education
According to the share of persons with higher education in the group of population aged 30-34, Lithuania ranks first in the EU (2014).
III. Employability
On average only **52 per cent** of 2013 graduates in one year after the completion of studies **are employed in a position requiring higher education.**
IV. Potential of science
In 2015 international experts evaluated the activity of of the majority of scientists' groups as being **average on a national scale, or as being strong on a national scale with a limited international acknowledgement** (). The activity in the field of social science was evaluated as poor. **The implementation of research activity was called the weakest link in all the fields of research.**

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[1] Examples of competition scores received:

Having received 16 (the lowest passing score) points out of 100 for national examination (NE) of the main subject, and with grades of 4 in other three included subjects, the CS amounts to **1.12**.

Having received 30 points for NE of the main CS subject, and with grades of 5 in other three included subjects, the CS amounts to **2.1**.

Having received 40 points for NE of the main CS subject, and having received 40 on other two included subjects, and with annual grade of 6 in the third subject, the CS amounts to **4.04**.

Lithuanian scientific potential is scattered, among extremely small groups of scientists at different institutions, therefore it shows little competitiveness on an international scale.
Lithuania (based on data of 2015) is one of the countries receiving the fewest grants from the Horizon2020 programme, as well as the one **publishing the fewest joint publications in cooperation with foreign partners**.
Publications of Lithuanian scientists are on average scarcely quoted. **In Lithuania, only 2.3 per cent of PhD students are from abroad (it is the lowest percentage in the EU).**
V. Innovativeness and competitiveness of the country
Despite the fact that Lithuania has the highest number of educated people in the age group of 30-34, **according to the European innovation scoreboard,** it ranks **4-5 from the bottom** for many years in a row, even though the number of EU Member States increases.
VI. Finances
In Lithuania, the share of public spending (of GDP) on higher education exceeds the EU average. Ineffective use of funds (split potential, minor study programmes with a low number of students) restricts the enhancement of study quality, and raise of wages to academic staff.
At the same time, **the share of expenditure on R&D (of GDP) is far behind the EU average.**
Lithuania is considered to be **the country which allocates a very small portion of R&D costs to working costs**. Which suggests that **researchers receive a salary inadequately low to their professional qualification**.
According to sources of financing, **both business and state attributed funds to R&D per share of GDP is strongly behind the EU average**.
According to R&D costs (use) per sector: **in Lithuania an extremely low share of R&D costs, coming from various sources, is spent via business sector**. A much larger share is spent via public sector, and according to percentage of GDP it is close to the EU average.

Proposals

Requirements to higher education institutions and reorganisation of institutional evaluation
The Law on Higher Education and Research (LoHER) must include: - more detailed definitions of a college and a university in regard to their mission in the society.   - criteria based on which the compliance of a higher education institution to its status is evaluated: concerning the number of study areas in which studies are implemented; requirements concerning the level of research; requirements for internationalisation of higher education and research, and mobility; scope of cooperation with business; R&D and higher education infrastructure; competencies of admitted students; employability of graduates, etc.   - an assignment to the the Government of the Republic of Lithuania (Government) or an institution authorised by it to establish indices of the abovementioned criteria.   The Government or an institution authorised by it must: - establish criteria for evaluation of a higher education institution.   - adopt the new evaluation procedure of higher education institutions, which shall reflect the consistency between different state-organised assessments and an effective use of data held.   - update the procedure for the right to provide and evaluate PhD studies, in which the level of assessment of research activity performed is established based on regularly performed international assessment of R&D activity.

Study programme accreditation reform
The LoHER must include: • the transition from evaluation and accreditation of study programmes to that of the study fields.   • an assignment to the Government or an institution authorised by it, to prepare the procedure for evaluation and accreditation of study fields and establish respective indices.   The Government or an institution authorised by it must: • approve the procedure of evaluation and accreditation of study fields.   • establish respective indices according to study fields concerning the obligatory level of research activity, requirements for scientific pedagogic staff, requirements concerning infrastructure of research and studies, cooperation with business; pedagogic competencies of teachers; employability of graduates, etc.   The Ministry of Education and Science (MoES) must: • form an independent committee from stakeholders (most of them – business and industry associated structures, scientists of international level) to revise on-going study programmes, in order to evaluate the relevance (need) of study programmes of individual higher education institutions from the viewpoint of the labour market (R&D).
Financing reform: financing of studies
The LoHER must include an assignment for the Government or an institution authorised by it to establish: • conditions for the higher education institution (minimum competency of entrants according to study fields, minimum numbers of students admitted to the study field (programme), in order to assure the cost-effectiveness of studies), which, if complied with, allow the attribution of financing from the state budget (standard study price ("study voucher"), study scholarships).   • the number of state-funded places only after the evaluation of the share of graduates of that study field, who are employed in the position requiring higher education (additionally for colleges: to establish the share of graduates that work according to the education acquired), and what are the potential opportunities.   The Government or an institution authorised by it must: • revise the procedure for distribution of students' vouchers and scholarships.   • approve the procedure for establishing (reasoning) the number of state-funded places.
Financing reform: basic financing
The LoHER must include a provision stating that: • funds for economy and administration are included in student's voucher funds and attributed in proportion to the basic financing attributed to R&D.   The Government or an institution authorised by it must specify: • methodology for funding of studies (including study vouchers and scholarships, as well as funds attributed to economy and administration).   • financing methodology of R&D activity, establishing that the basic financing is allocated to R&D taking into consideration the results of annual bibliometric assessment and international comparative R&D activity assessment (performed every 5 years).   The MoES must: • specify methodology for assessment of R&D papers and establish bonuses for R&D papers of international level (for publications falling under 10 per cent of those mostly quoted); promotion of international cooperation (for joint publications with foreign partners, joint R&D projects with foreign partners), promotion of cooperation with private sector (for joint publications, putting more emphasis on the implementation of R&D orders by entities, for joint R&D projects with business).   • approve methodology for international comparative assessment of R&D activity (every 5 years).

• simplify (standardise, reduce the burden of [4]bureaucratic work) the collection of information needed for the assessment of R&D activity (for annual assessment of R&D activity; comparative assessment of scientific activity; R&D activity performance, by providing the right to PhD studies or by assessing the quality of PhD studies; for the assessment of R&D activity by performing institutional assessment) in different institutions. This information is now collected for different purposes, in different timeframes and forms.

Financing reform: competition financing
The LoHER must establish a provision stating that: • the regulations of the Research Council of Lithuania (RCL) shall be approved by the Government. The Government or an institution authorised by it must: • approve new regulations of RCL, which would not only set up research committees but also a Strategic Committee by specifying the principles of formation of committees, their functions and responsibilities, their role in forming national research programmes according to subjects indicated by state institutions, also by stating an opportunity to expand financing schemes and the necessary help from foreign experts in assessment of projects; and by enhancing the role of RCL fund.

Increase of Business R&D potential and review of R&D financing extent

The LoHER must establish:
• an opportunity of joint research doctoral studies with business.
 	
The Government must:
• overview measures promoting enhancement of business R&D potential:
    ○ funding of new research susceptible business start-up
    ○ enhancement of abilities of commercialisation of deliverables of research and higher education institutions
    ○ approval of regulations of joint PhD studies with business
• concentrate the potential of R&D in order to more effectively use R&D targeted funds, and boost Lithuanian attractiveness for foreign investment in research susceptible business.
• review possibilities to allocate more state budgetary funds for the purpose of promoting R&D both in public sector and business.

More effective use of funds allocated to higher education and R&D
The Seimas of the Republic of Lithuania (the Seimas), the Government and MoES must: • prepare the plan for reconstruction of higher education and research institutions by concentrating the existing potential for the purpose of enhancing the quality of higher education and R&D, make an opportunity to increase salaries of academic personnel at any extent, even considering that Lithuania attributes a very low share of R&D spending to labour costs.

Reconstruction of the network of state universities
First of all it is necessary to make "statements" from the information received from different analysis already performed, based on the above-mentioned criteria to assess the following: • Current compliance of universities to minimum requirements • The spread of research potential in universities (and institutes) according to the fields of research • Distribution of studies (per fields and number of students) between universities • Proportion of the on-going studies and the existent research potential • Compliance of study distribution to cost-effectiveness criteria. According to "statements" <u>MoES must</u> prepare possible network reconstruction scenarios in regards to further forecasted decline in the number of graduates. <u>Upon approval of the Government</u> to particular scenario it shall be provided for approval to the <u>Seimas</u>. Once the Seimas approves a particular scenario: • MoES must prepare projects of preliminary reconstruction plans of institutions being

incorporated, which must include the structure, key activities, strategy of potential integration, etc.

- Once the Government approves these projects, to form task forces for detailing these plans
- To prepare (task forces, MoES, the Government) and approve (the Seimas) legal acts on the establishment of new universities (or reorganisation or merger (affiliation) of the existing ones), implementation of reorganisation plans.
- To implement plans of reconstruction.

### Reconstruction of the network of state research institutes

MoES must prepare draft resolutions of the Government concerning the reorganisation of institutes of humanities.

Introduction

The review focuses on the key principles, criteria and conditions, based on which the higher education system of Lithuania might be overviewed. Its institutions (universities and colleges) as well as higher education and research activity performed in them might be assessed, financing principles might be corrected in order to best use the potential of Lithuania, constantly update it and effectively enhance the quality of higher education, in reaction to most important issues and challenges of the system. When speaking about requirements for universities or colleges, the most obviously required conditions (yet not always sufficient, using maximum opportunities of the highest level activity) are meant, which should be met by institutions in the near future in order to maintain the status of an independent higher education institution of one type or another. The assessment system of their performance would become more efficient, less bureaucratic, and financing system based on results thereof would promote quality performance based on internationality of higher education and research, increase international competitiveness of higher education and research system.

I. State analysis

Numbers of higher education institutions and students. The system[2] of higher education and research in Lithuania is formed of 22 universities (14 state owned and 8 private), 23 colleges (13 state owned and 10 private) and 13 state owned and 9 private research institutes.
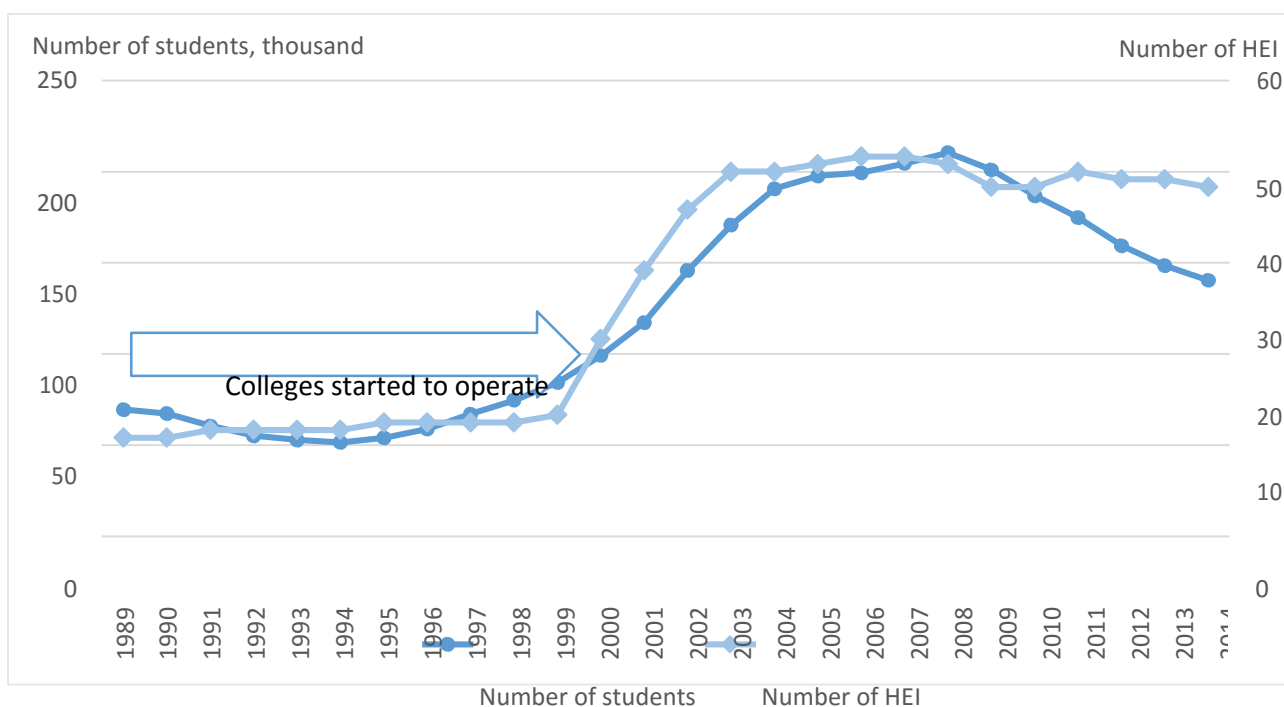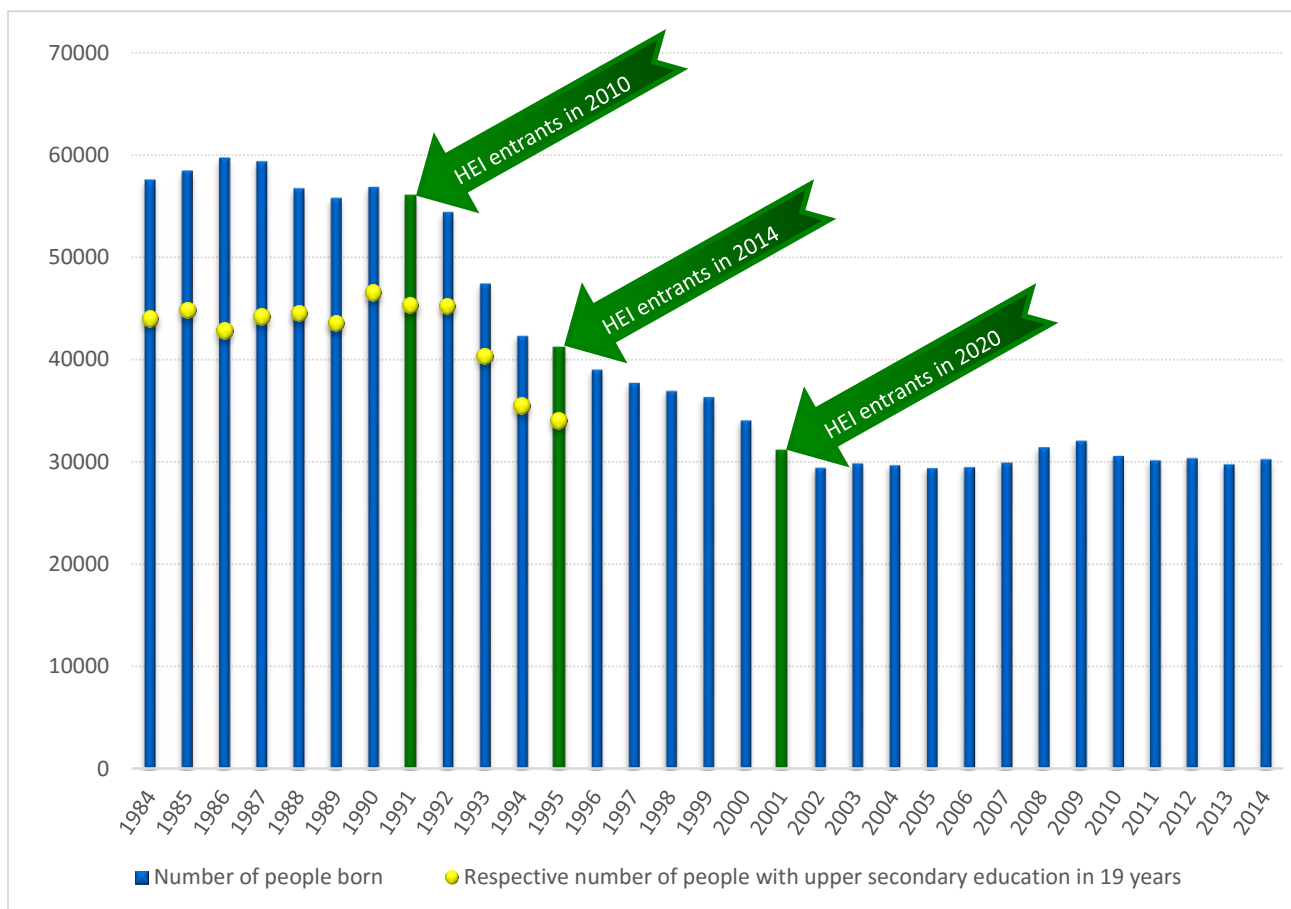

Data source: SL[3]

Figure 1. Dynamics of numbers of students and higher education institutions

Since 2008-2009 until 2014-2015 the number of students in Lithuanian higher education institutions decreased by one third: from 210 thousand to 140 thousand (see Fig. 1), the tendency will remain for the next years, only due to decrease in number of graduates

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[2] Data of 1 January 2016.
[3] Statistics Lithuania.

 (due to birth-rate gap the number of graduates is expected to be even lower by 2021 (see Fig. 2)). The number of higher education institutions remained more or less stable during the period mentioned (see Fig. 1).

Data source: Statistics Lithuania

Figure 2. Decrease of number of graduates

> *Since 2008 the number of students decreased by one third, the number of higher education institutions remained stable. It is expected that by 2020 the number of graduates is still to be lower by one fourth.*

Entering higher education institutions. The number of graduates is decreasing, and the share of people willing to enter higher education institutions remains similar – fluctuates from 62 to 64 per cent (Fig. 3).
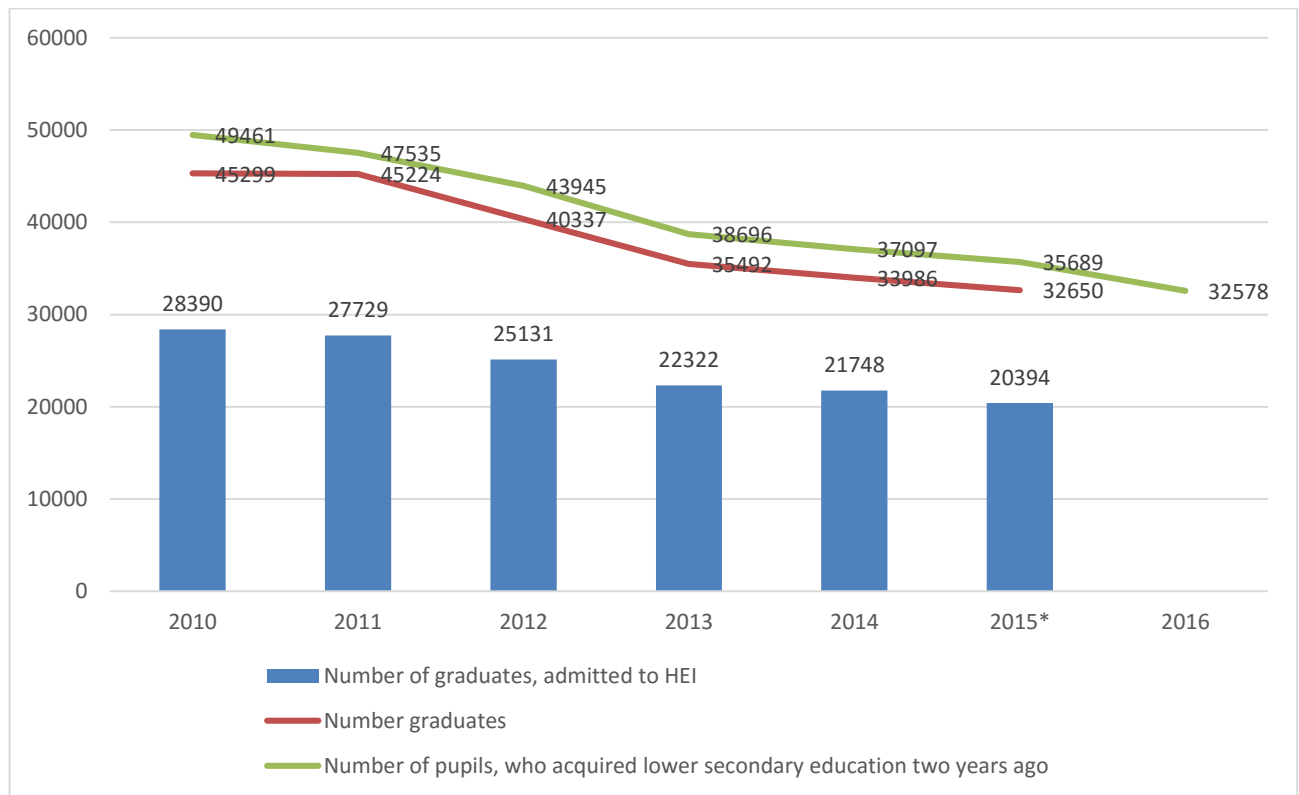
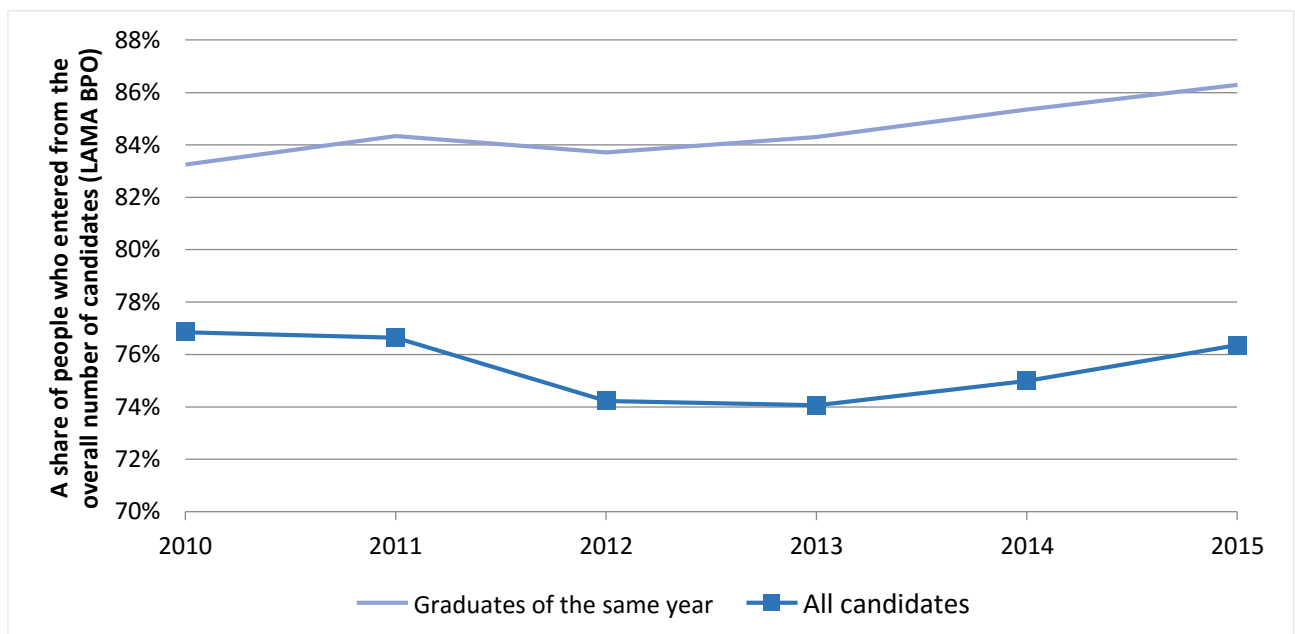Data source: LAMA BPO[4], SL

Figure 3. Dynamics of people entering higher education institutions[5]

Higher education institutions accept a larger part of people willing to enter (see Fig. 4). The difference between those entering HEIs after a break and graduates of the same year is obvious, those entering after a break find it more difficult to enter (see Fig. 4).

[4] LAMA BPO – Lithuania's association of higher education institutions for the organisation of general admission.
[5] In order to see what share of pupils with lower secondary education acquire upper secondary education in 2 years, the number of pupils with lower secondary education is moved ("to the right") within two years. Thus, although no data is available on the number of people with upper secondary education in 2016 yet, it may be seen that as the number of pupils with lower secondary education is reduced, in proportion the number of upper secondary education should be lower.

Figure 4. Dynamics of people admitted to higher education institutions

Data source: LAMA BPO
Calculation: MOSTA

> *The number of graduates is decreasing, but the share of people entering higher education institutions remains similar. Higher education institutions admit a larger share of candidates.*

Preparation of candidates for studies. Between those accepted via LAMA BPO to the state-funded study places in Lithuanian higher education institutions or those who have received scholarships (hereinafter – SF / SCH) over one fourth of admitted persons have received less than 4 competition scores (CS)[6], in colleges such people made up 54 per cent. Entrants with CS of 6-10 only make a little over of one tenth (Figure 5) of those who have entered colleges. In universities, people who were admitted to SF /SCH places with competition score of 6-10 make up the majority (78 per cent).

	0–2	2–4	4–6	6–8	8 and more
Total (14 311)	4%	23%	27%	30%	16%
Universities (7373)	0% 1%	21%	49%	29%	
Colleges (6938)	8%	46%	34%	11%	1%
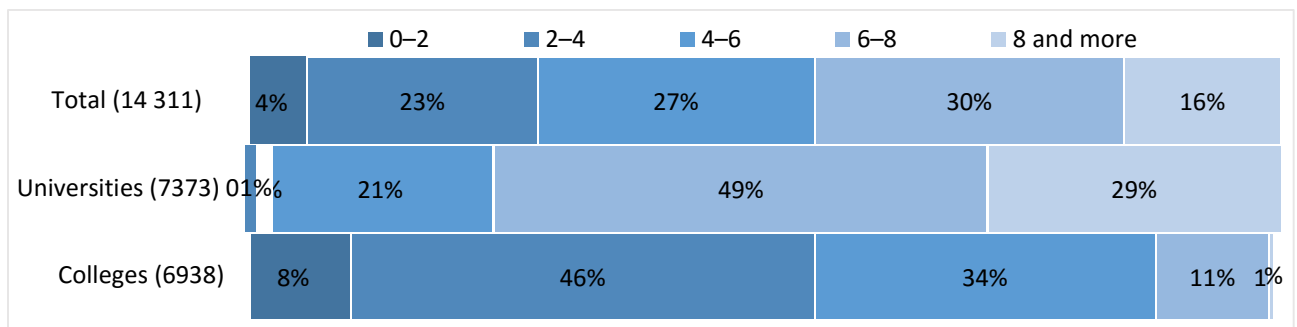
Data source: LAMA BPO
Calculations: MOSTA

Figure 5. Level of education of people who entered (competition scores). State-funded places
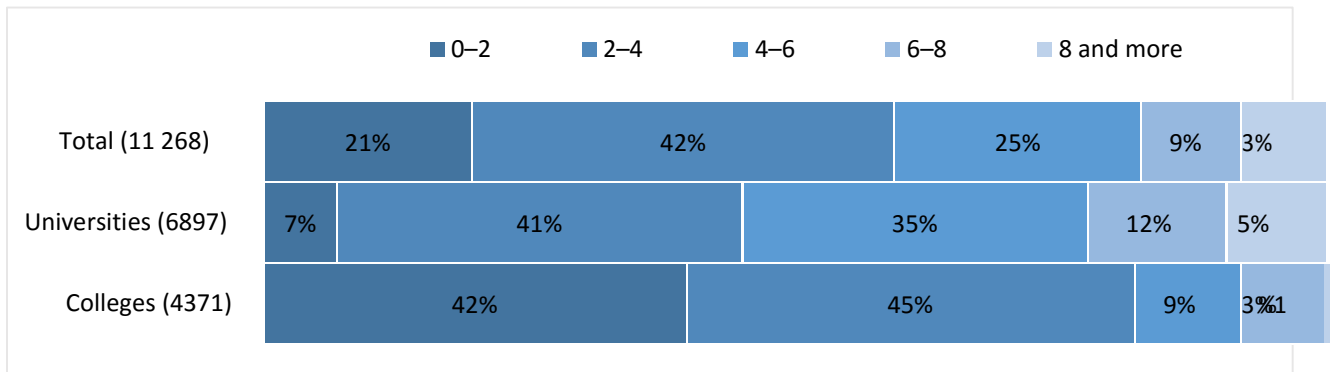
It would be difficult to evaluate the competence of people who entered non-state-funded places as upon entrance to such places some institutions add the so called loyalty scores. However, in this situation competition scores are also much lower than of those entering SF / SCH places, over 60 per cent of people admitted to higher education institutions have collected less than 4 scores (see Fig. 6).

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[6] Examples of competition scores received:
Having received 16 points out of 100 for national examination (NE) of the main subject, and with grades of 4 in other three included subjects, the CS amounts to **1.12**.
Having received 30 points for NE of the main CS subject, and with grades of 5 in other three included subjects, the CS amounts to **2.1**.
Having received 40 points for NE of the main CS subject, and having received 40 on other two included subjects, and with annual grade of 6 in the third subject, the CS amounts to **4.04**.

	0–2	2–4	4–6	6–8	8 and more
Total (11 268)	21%	42%	25%	9%	3%
Universities (6897)	7%	41%	35%	12%	5%
Colleges (4371)	42%	45%		9%	3% 1

**Figure 6. Level of education of people who entered (competition scores). Non-state-funded places**

> *Between those accepted via LAMA BPO (in 2015) to the state-funded study places in Lithuanian higher education institutions or those who have received scholarships (hereinafter – SF / SCH) over one fourth of admitted persons have received less than 4 competition scores (CS). Over three thirds of university entrants to SF / SCH places have received more than 6 scores. Persons admitted to 60 per cent of the non-state-funded study places in higher education institutions have received less than 4 scores.*

Admission not via LAMA BPO. It should be noted that the information concerning admission provided above is based on LAM BPO data only. Another 25 per cent of students are accepted to non-state-funded places in higher education institutions not via LAMA BPO system. In 2014 17 per cent of students were admitted to the first study cycle and first year of the integrated studies in state universities, and 27 per cent were admitted to state colleges.[7]

> *Around 25 per cent of students are accepted to non-state-financed places not via LAMA BPO, thus data on their competition scores are fragmental.*

Number of students in programmes. As the number of programmes increases and the number of students decreases, the programmes in average have less and less students. Unfortunately, the share of programmes, in which 1-10 students are accepted during general admission process, is increasing (see Fig. 7).

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[7] It is expected that thus more often foreign students are admitted, also people who have earlier acquired their upper secondary education or have higher education and other people, who do not claim to enter state-funded places.
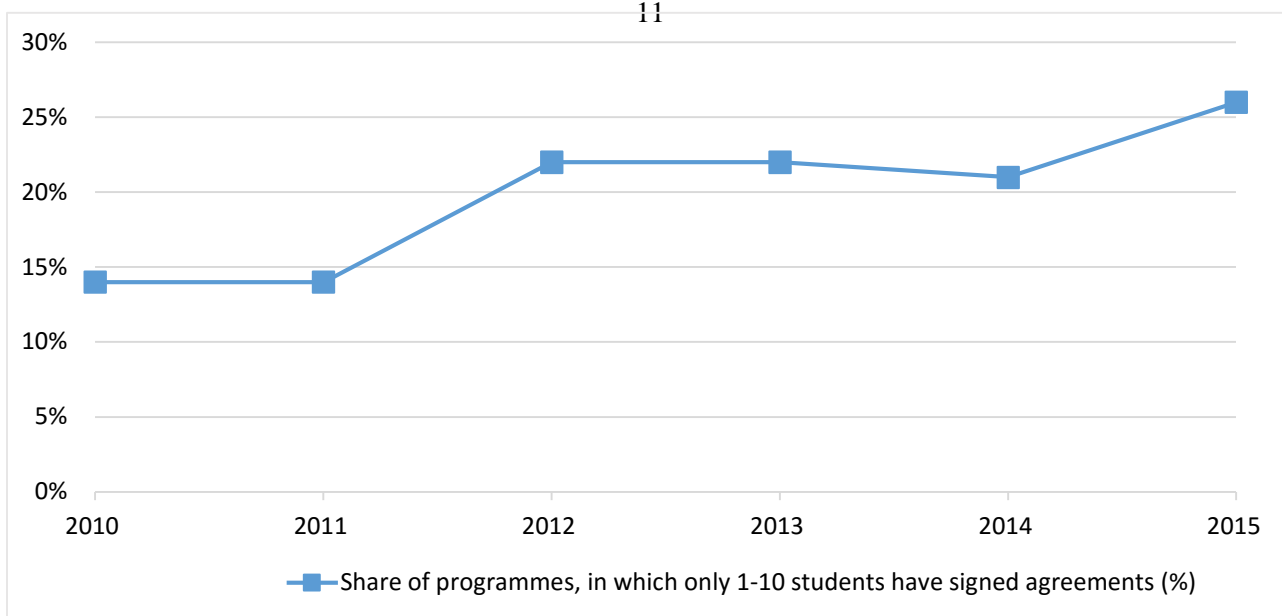
Data source: LAMA BPO

Calculations: MOSTA

Figure 7. Dynamics of the number of entrants in separate study programmes

> *The number of programmes increases, and the number of students decreases. Already one fourth of the programmes have less than 10 students enrolled.*

Internationality of higher education. A large portion of Lithuanian citizens are studying in higher education institutions abroad, meanwhile Lithuania is not an attractive destination to foreign students. It was noted that Lithuanian higher education focuses on the local market, which reduces international competitiveness of higher education and research. According to Eurostat, in 2012 8.3 per cent of Lithuanian students went to study full study programmes in higher education institutions of 27 EU/EEA/candidate states, which highly exceeds the EU average, which is 3.5 per cent. However, the number of individuals coming to study in Lithuania from EU 27/EEA/candidate states makes only 0.2 per cent, when the EU 27 average is 3.6 per cent (see Fig. 8).
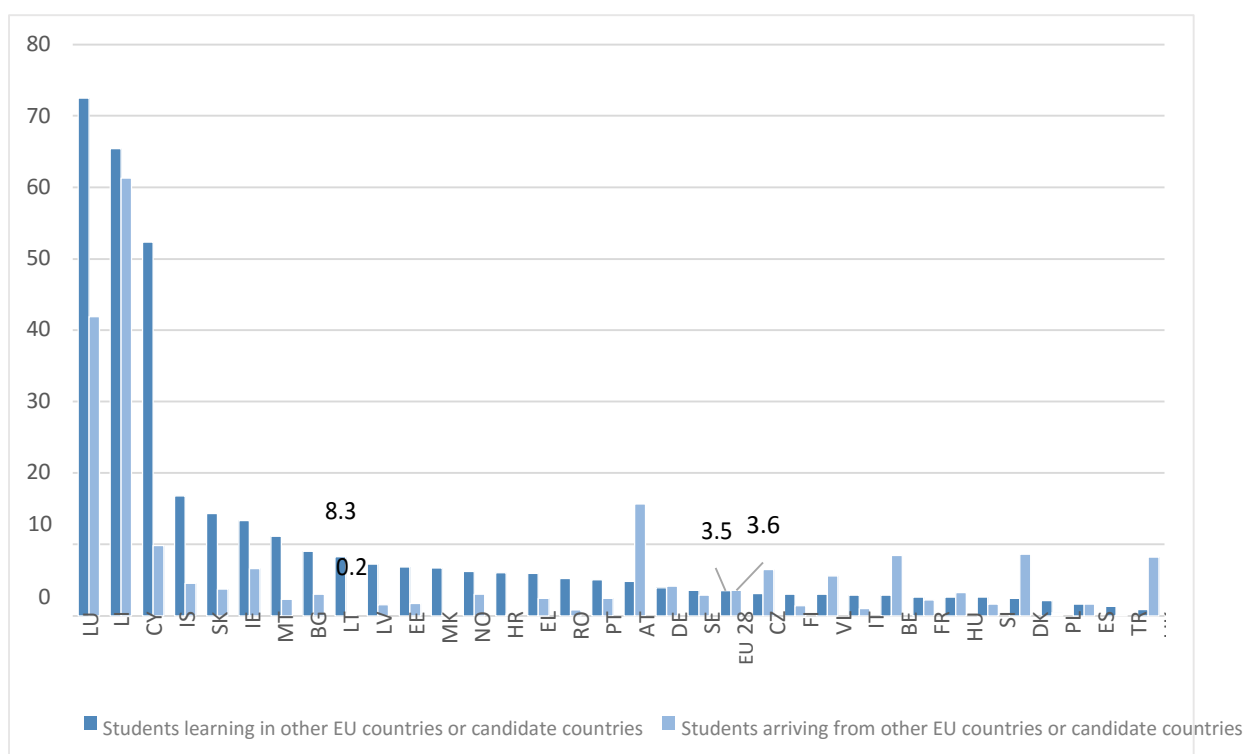
Data source: Eurostat

Figure 8.   Mobility of students seeking the higher education degree (ISCED 5-6) in the EU countries or candidate countries (percent), 2012

The proportion of students arriving and leaving under the Erasmus programme remains negative, though slightly improving (for more details see Annex 1).

> *Approx. 8 percent of Lithuanian students leave to study in the 27 EU/EEA/candidate countries for the whole duration of the study programme, while on average this number makes up 3.5 percent in the EU. The number of students coming to Lithuania from the 27 EU/EEA/candidate countries is only 0.2 percent, while on average this number makes up 3.6 percent in the 27 EU countries.*

The mobility of teachers remains low. The number of higher education staff leaving under the Erasmus programme is 1.5 times higher compared to those arriving. In the period between 2013 and 2014, 1862 higher education employees left under the Erasmus programme and 1269 foreign employees arrived (for more details see Annex 2). A heavy workload is indicated by teachers as the main obstacle to upgrading skills abroad. The survey of teachers by MOSTA in 2014 revealed that 35 percent of teachers were totally prevented from visiting foreign countries for professional purposes by "lack of time due to a heavy workload".[8]

> *The number of higher education staff leaving under the Erasmus programme is 1.5 times higher compared to those arriving.*

Education. In 2014, Lithuania was already a leading EU country by the percentage of individuals with higher education in the 30-34 year old group (Figure 9). The Europe 2020 strategy has set the objective to have 40 percent of 30-34 year old population with higher education by 2020. This rate has already been exceeded in Lithuania.

However, speaking of the consistency between education offer and the demand in the labour market (according to 2012-2013 MOSTA survey of higher education institution graduates), it transpires that in a year after graduating, averagely only 52 percent of year 2013 graduates of all study cycles were employed in the positions where higher education was required.

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[8] Source: Quality of Studies: The View of the Interested Parties. Survey Summary, MOSTA, 2015.
(http://mosta.lt/images/leidiniai/Studiju_kokybe_suinteresuotuju_saliu_poziuris._Santrauka.pdf)
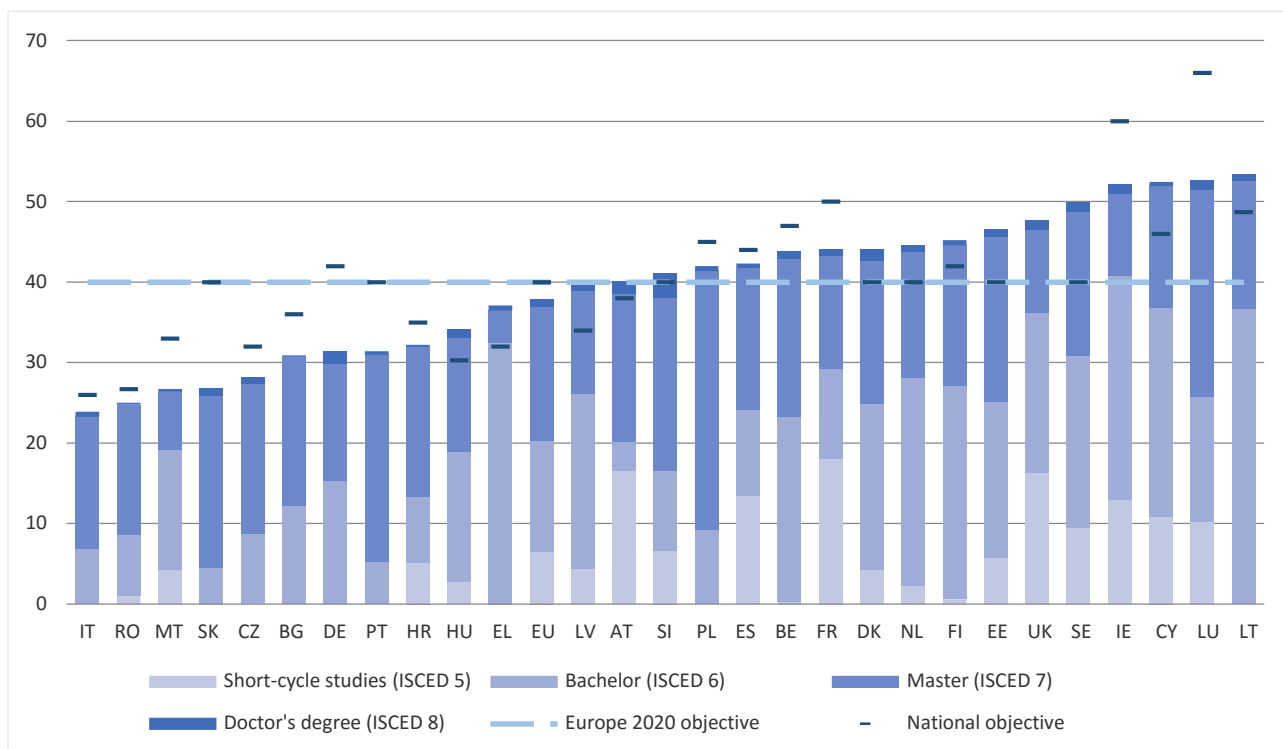
Data source: Eurostat

Figure 9. **The level of education in the 30-34 years old group. Data of year 2014.**

Lithuania is a leading EU country by the percentage of individuals with higher education in the 30-34 year group.

Employment of graduates. As mentioned above, MOSTA performed the survey of employment among the higher education institution graduates of year 2012 and 2013, which showed, that compared by the disciplines and their groups, the portion of graduates employed in the positions where higher education was required, varied greatly. Even a pilot survey revealed that a number of future professionals with higher education is much higher than required in the labour market; therefore the scale of admission in many disciplines could be reduced. Starting with this year, MOSTA will be able to perform continuous monitoring of these processes and give more detailed information on the situation based on the study fields as well as on separate study programmes and higher education institutions .
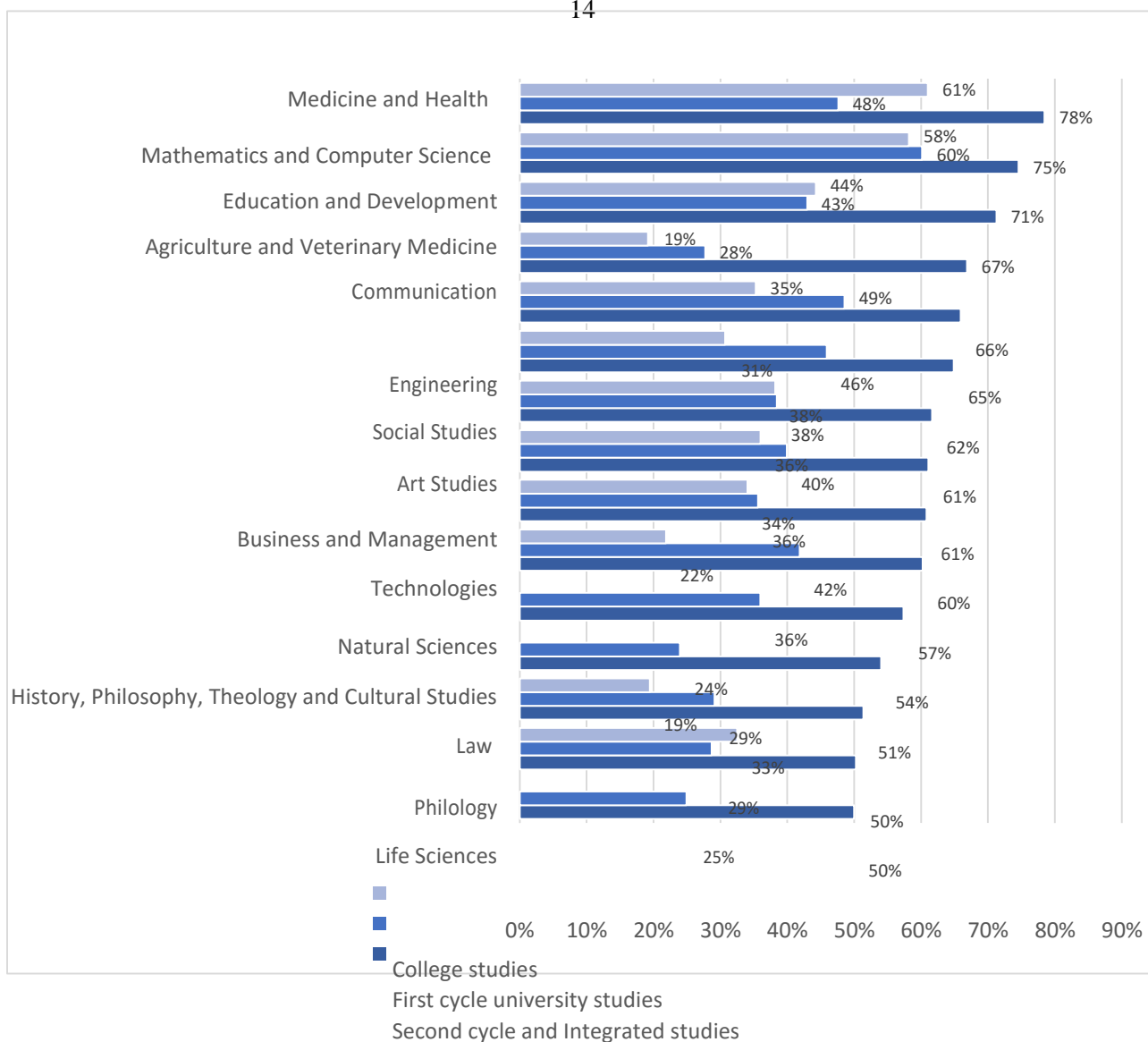
Figure 10. **The rate of employment according to the "level of qualification"**

A year following graduation, on average only 52 percent of year 2013 graduates were employed in the positions where higher education was required.

Scientific potential. In 2015, an international evaluation[10] assessed the scientific activity of the Lithuanian scientific groups based on four aspects: scientific activity level, scientific activity management, level of infrastructure and potential of development. In many units of assessment, the scientific activity was evaluated as "medium on the national level", while another large part – as "strong on the national level with limited international recognition". The quality of the scientific

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[9] Comments on the calculation of rate: for college studies calculation is based on the college graduates of year 2013, who were employed in the 1, 2 or 3 major occupation groups at least one day in the period between 30.06.2013 and 01.07.2014 (according to Lithuanian Classification of Occupations, LCO); for university studies the calculation is based on the graduates of year 2013 of university first cycle or second cycle studies and integrated studies, who were employed in the 1 or 2 major occupation groups at least one day in the period between 30.06.2013 and 01.07.2014 (according to LCO). Occupation groups according to LCO (Lithuanian Classification of Occupations): 1 – Managers, 2 – Professionals, 3 – Technicians and Associate professionals. The calculated percentage rate is based on the graduates of year 2013.
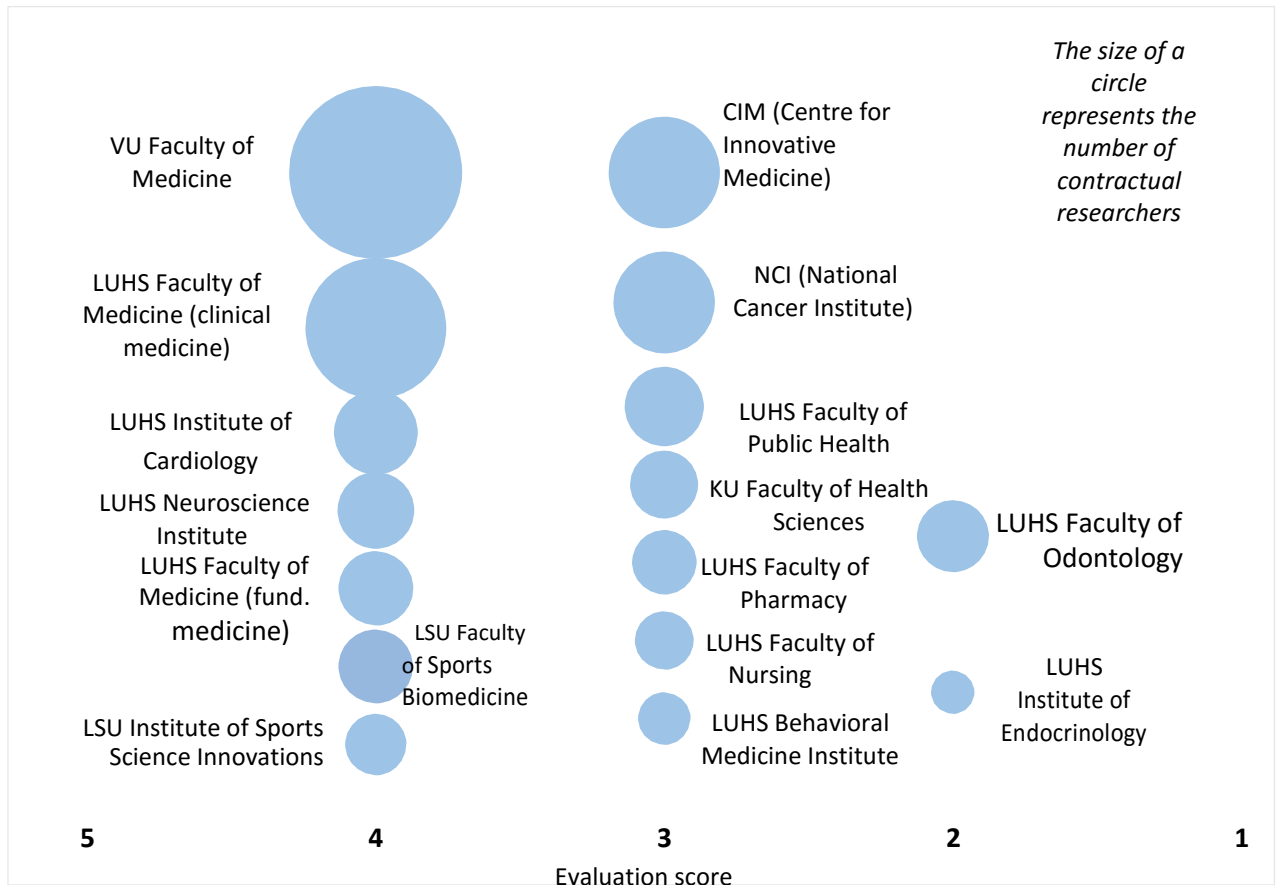
[10] Source: Research Assessment Exercise, MOSTA, 2015. (www.mosta.lt/lt/mokslines-veiklos-palyginamasis-tyrimas/ataskaitos).

activity in the areas of physical sciences and biomedical sciences and its impact on the discipline of scientific research were on the best level compared to other scientific branches in the international context. Other biomedical sciences, speaking of their economic and social impact in Lithuania and their material infrastructure, are rising to the status of the strong sciences on the international level. In the international context, the level of Lithuanian scientific social area research is evaluated as low. These rather moderate results in the social science area are likely due to such factors as the need to "rebuild" these disciplines after their neglect during the Soviet period and due to too much focus on the thematics and publications of national importance. The major potential lies with physical sciences and biomedical sciences. The management of the scientific activity is the weakest link in all scientific branches. For more detailed information on the level of the scientific activity of scientists see Annex 3.

> ***The major part of scientist group activities was evaluated by the international experts as medium on the national level or strong on the national level with limited international recognition. The level of scientific research in the social area was evaluated as low in the international context. The management of the scientific activity is the weakest link in all scientific branches.***

Scattered scientific potential. Back in 1996, the Lithuanian R&D system was already diagnosed with fragmentation and thematic overlapping in research, while in 2015, experts only reiterated[11] the fact of the existing problem. Particularly great fragmentation is observed in the humanities and social sciences. For instance, in the humanities, 25 percent (6 out of 24) of the units of assessment were made up of less than 10 full time equivalents (FTE) of researchers. In social sciences, 11 minor units of assessment conduct research in the economic field. The experts believe that for a country of the size of Lithuania such level of fragmentation and overlapping is too high. For more detailed information on the fragmentation of scientific potential see Annex 9 and Annex 10.

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[11] Ibid.

The size of a circle represents the number of contractual researchers

VU Faculty of Medicine

LUHS Faculty of Medicine (clinical medicine)

LUHS Institute of Cardiology

LUHS Neuroscience Institute

LUHS Faculty of Medicine (fund. medicine)

LSU Faculty of Sports Biomedicine

LSU Institute of Sports Science Innovations

CIM (Centre for Innovative Medicine)

NCI (National Cancer Institute)

LUHS Faculty of Public Health

KU Faculty of Health Sciences

LUHS Faculty of Pharmacy

LUHS Faculty of Nursing

LUHS Behavioral Medicine Institute

LUHS Faculty of Odontology

LUHS Institute of Endocrinology

5   4   3   2   1

Evaluation score

Data source: MOSTA, Lithuanian Research Assessment Exercise, 2014–2015[12]

Figure 11.   The quality of the scientific activity, and its impact on the scientific research discipline, of the units of assessment in the higher education institutions with the study fields of medicine in the branch of biomedical sciences[13]

Lithuanian scientific potential is very scattered, in some cases very small groups of scientists are based in different institutions and unconsolidated Lithuanian scientific potential shows poor competitiveness on the international level.

Internationalisation of science. Horizon 2020 programme (implemented during 2014-2020) is the most extensive research and innovations programme in the EU. In view of the programme requirements and high level of competition, involvement in the project as a partner may be seen as an important recognition of one's scientific activity. Lithuania still remains one of the countries with the lowest rate of EC grants under the Horizon 2020 programme (see Figure 12).

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[12] Contractual researchers – the sum of the part of declared higher education teacher tenures, allocated to R&D, and of the scientific tenures (excluding doctoral students), 31.03.2014.

[13] Evaluation scale: 1 – weak on a national level, 2 – medium on a national level, 3 – strong on a national level with limited international recognition, 4 – strong on the international level, 5 – global leader. Source: Research Assessment Exercise, MOSTA, 2015.

(www.mosta.lt/lt/mokslines-veiklos-palyginamasis-tyrimas/ataskaitos).
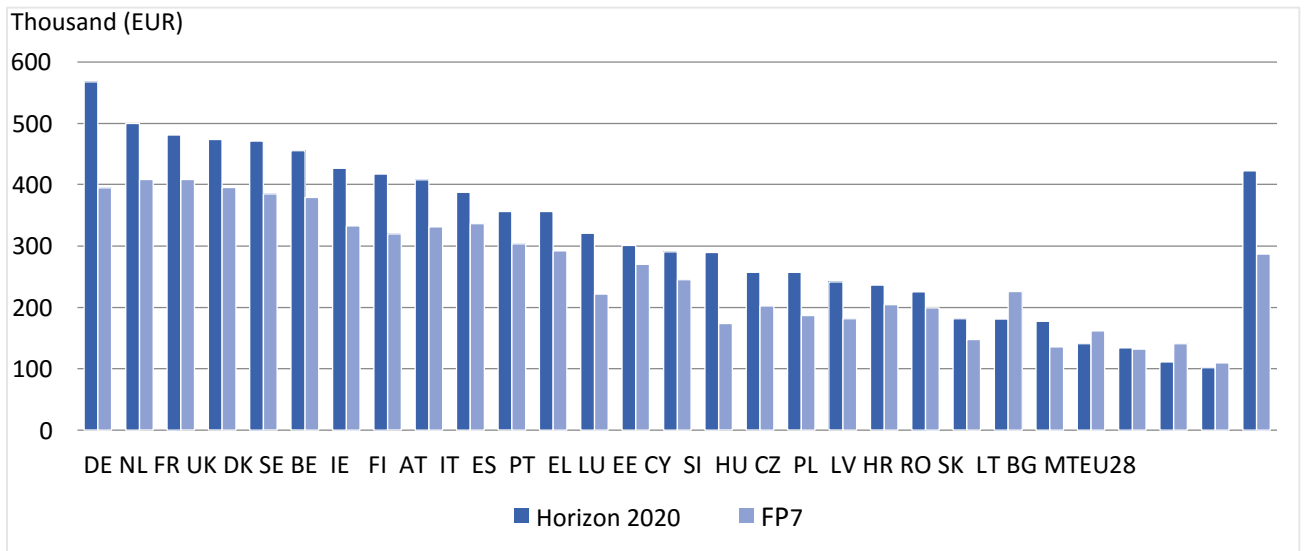
Data source: data from EC, FP7 (06.10.2014), Horizon 2020 (30.10.2015)

Calculations: MOSTA

Figure 12. Average EC grant per one project member participating in the Seventh Framework Programme for Research and Technological Development (FP7) and Horizon 2020 programme

Compared to other EU countries, Lithuanian authors as co-authors of articles published together with foreign researchers make up a low 36 percent. On average their publications are rarely cited (see Figure 13).
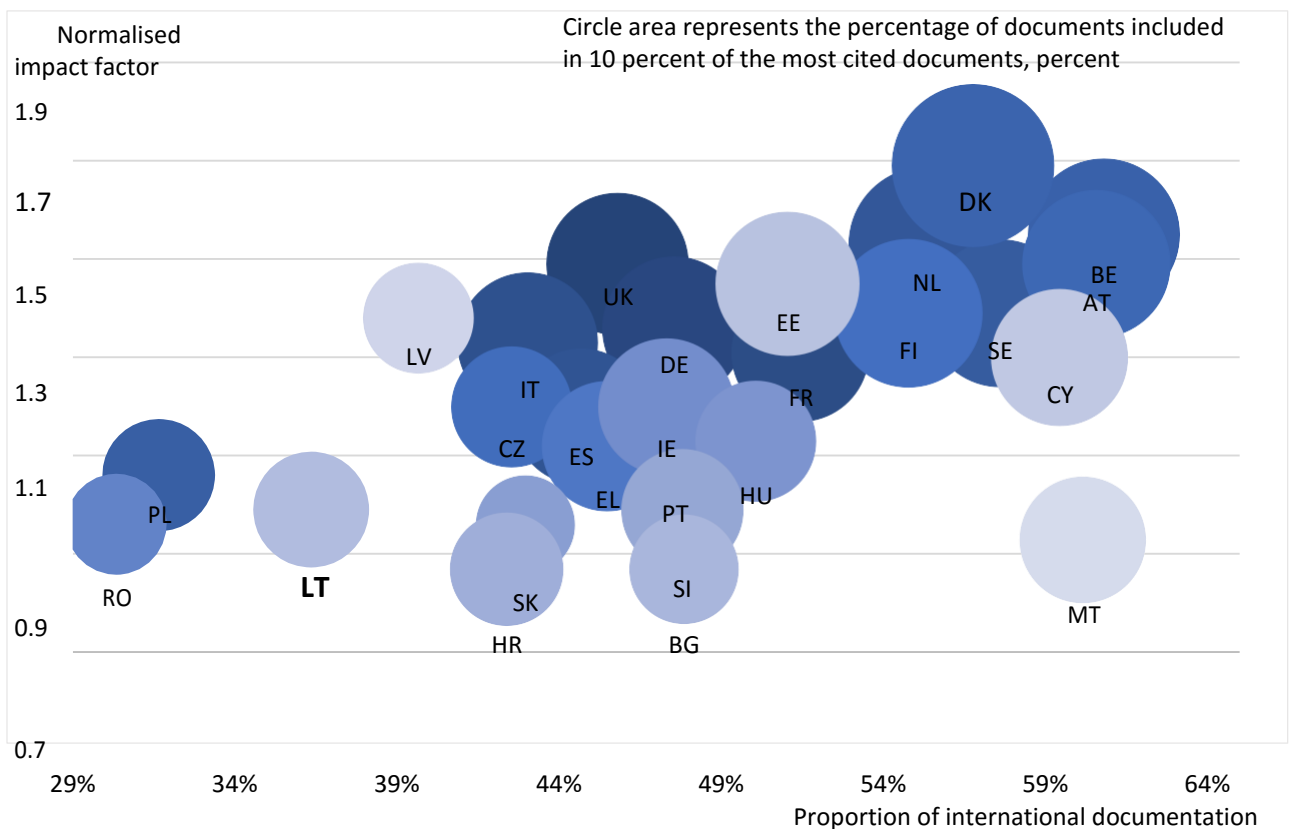
Data source: InCites (Web of Science Core Collection), 30.07.2015

Calculations: MOSTA[14]

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[14] Normalised impact factor – a number of citations per document, normalised based on thematics, year and document type.

International publication – a publication by at least two authors and attributed to different countries.

Figure 13.   Comparison of the proportion of international publications and citations (2014)

In 2015, the number of doctoral students from foreign countries seeking the third cycle degree equalled to 2.3 percent of all doctoral students. The percentage is among the lowest in the EU (see Figure 14).

<div align="right">Data source: EMIS</div>

Figure 14.   International mobility of doctoral students by host countries

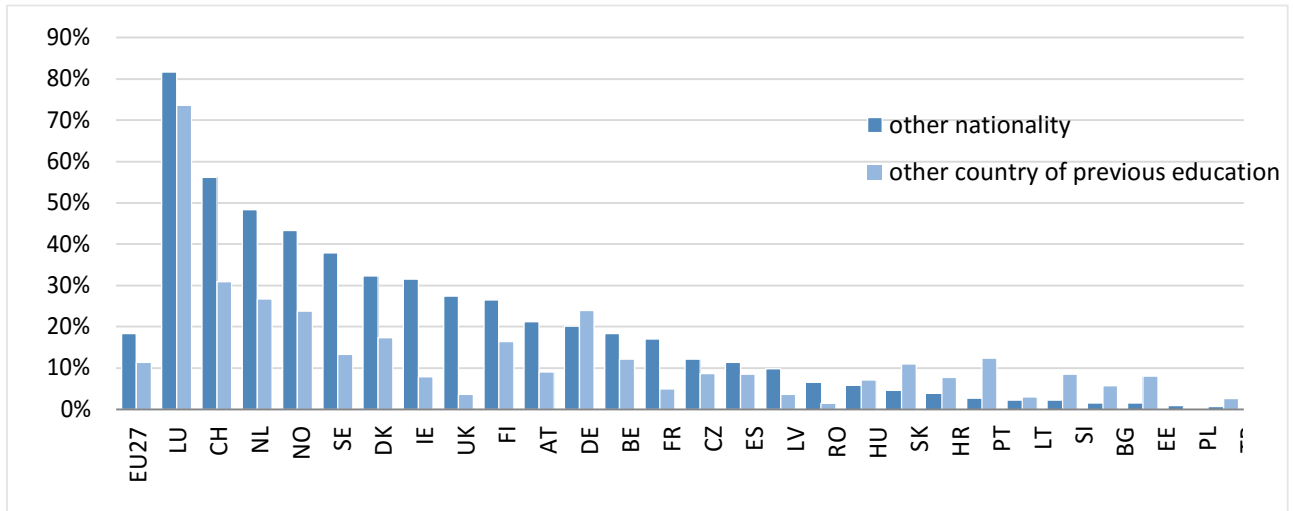> *Lithuanian has the lowest level of grants under the Horizon2020 programme and is one of the countries with the lowest number of joint publications issued together with foreign partners; on average, the citation level of publications by Lithuanian scientists is low. Only 2.3 percent of doctoral students in Lithuania come from foreign countries – the rate is among the lowest in the EU.*

Innovation of the country (competitiveness) and dependency on well-being of the population. Regardless of the fact, that Lithuania is the most educated country in the group of 30-34 year old population, its innovation level remains low: for many years now Lithuania has been in the last 4th or 5th places of the European Innovation Scoreboard (EIS), though the number of the EU member states has been increasing. As shown in Figure 15, the level of innovation in countries correlates well with GDP per capita.
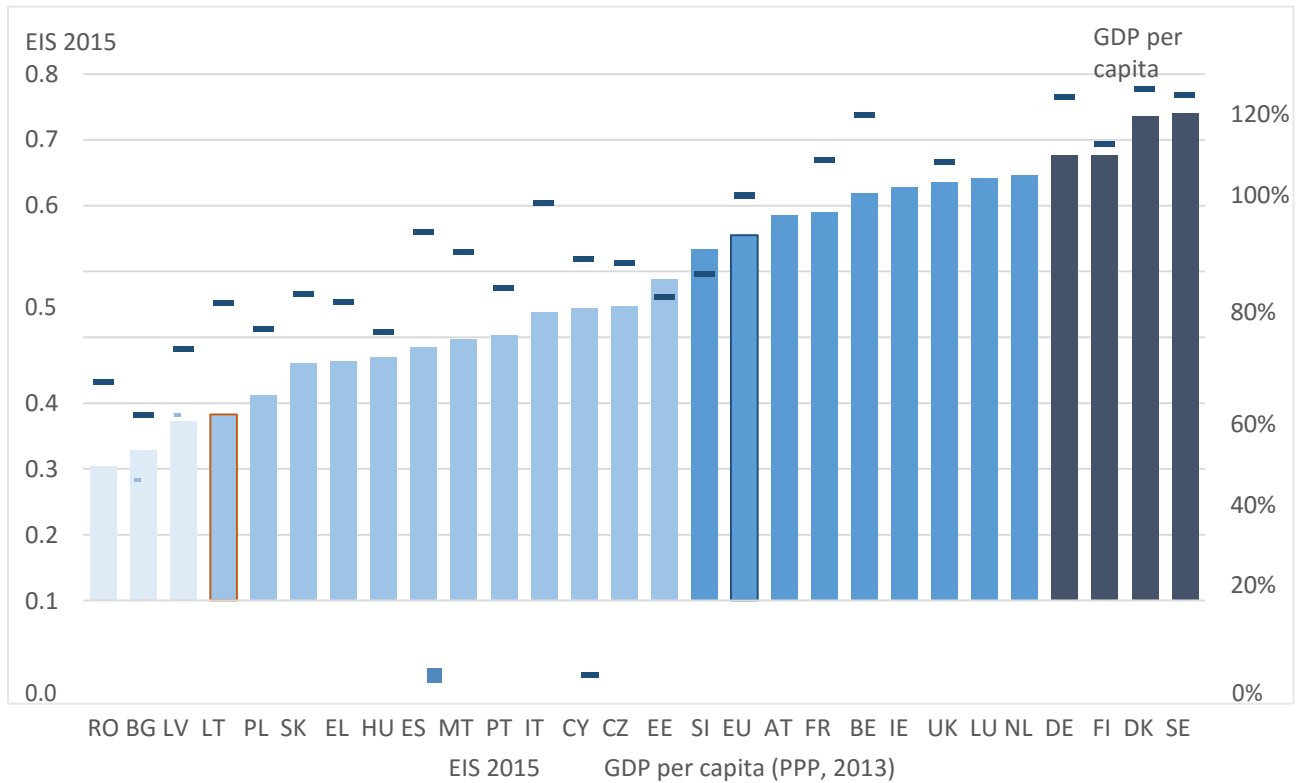
Data sources: EC, European Innovation Scoreboard, 2015; Eurostat

Figure 15.   The innovation index and GDP per capita in countries

> *Even though Lithuania is the most educated country in the group of 30-34 year old population, for many years now Lithuania has been in the last 4th or 5th places of the European Innovation Scoreboard (EIS), though the number of the EU member states has been increasing.*

Spending on higher education. Lithuanian public expenditure on higher education allocated as percentage of GDP is growing and has already exceeded the EU average. In 2004-2012, Lithuanian public expenditure on higher education increased from 1.1 percent to 1.4 percent of GDP and slightly exceeded the EU average, which made up 1.3 percent in 2011 (see Figure 16 and Annex 4). Scattered resources in the higher education system, small groups of studies, narrow study programmes with a small number of students learning in these programmes, basically stable, non-reducing area of maintained premises – these are the main causes of ineffective use of funds making a negative influence on the quality of studies, increasing workload of teachers and missing the opportunities to raise salaries of the academic staff.
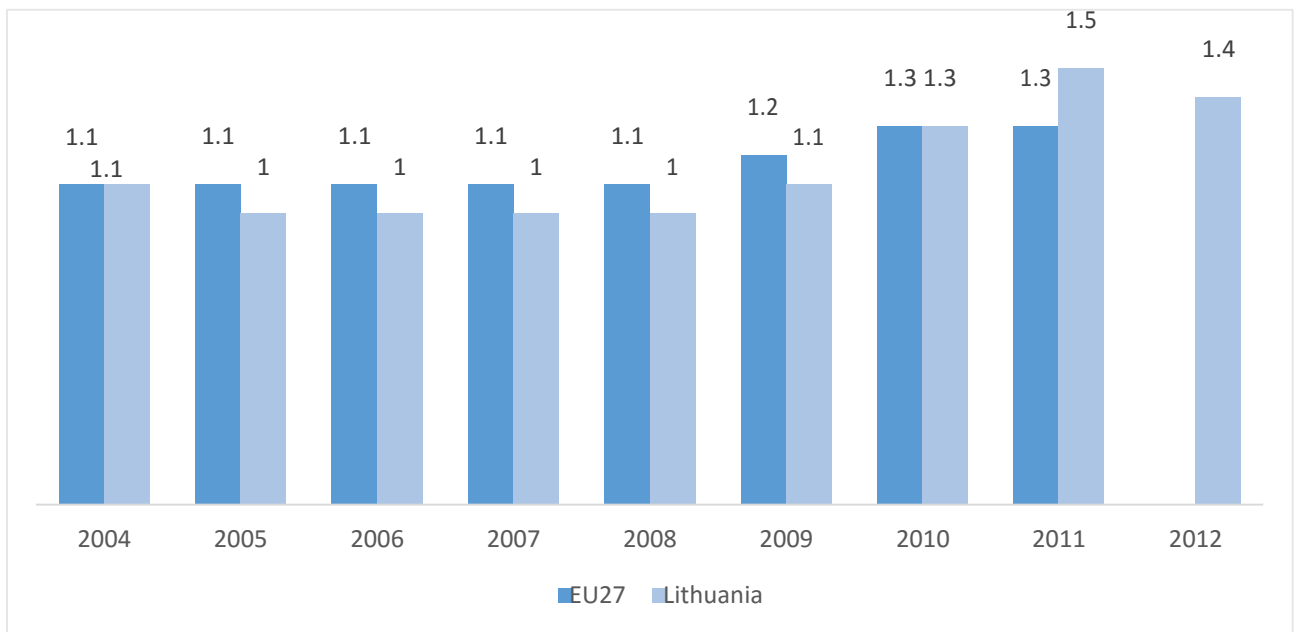
Data source: Eurostat

Figure 16.   Public expenditure on higher education (ISCED 5 and 6), percentage of GDP

Lithuanian public expenditure on higher education as percentage of GDP is exceeding the EU average. The higher education system needs reorganisation to use these funds more effectively and improve the quality of studies as well as increase scientific academic staff wages.

Spending on R&D. A slight increase in Lithuanian spending on R&D has been observed (see dynamics in Annex 5); nevertheless, these funds are still rather small if compared by absolute numbers and percentage of GDP (see Figure 17 and Figure 18).
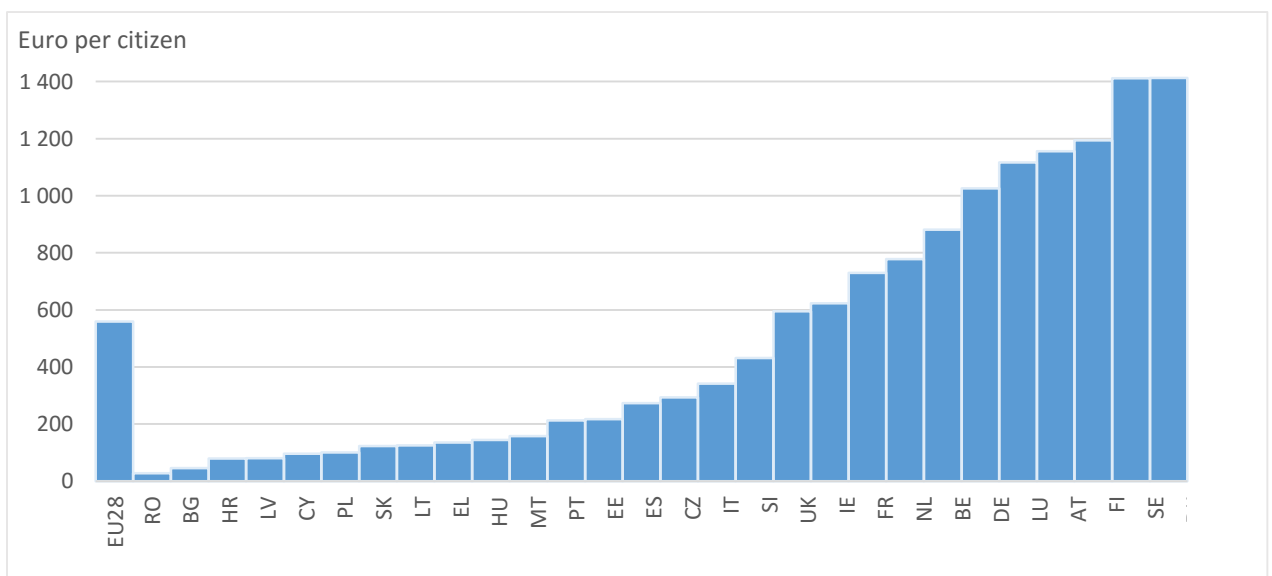
Data source: Eurostat, 2014.

Figure 17.   Spending on R&D per country citizen

Usually the spending on R&D is assessed in two ways: by the amount of money spent (used) in business and public sectors and by the amount of money allocated to R&D taking into account the nature of initial sources of these funds.

In Lithuania, funds spent on R&D in higher education and government (mostly scientific research institutes) sectors approximately correspond to the EU average (see Figure 16). However the level of these funds spent in the business sector is very low (also if counted by GDP percent) and this is due to poor business sector capacity in the R&D area.

Data source: Eurostat

Figure 18.   Spending on R&D by sectors, percentage of GDP, Eurostat, 2013

Lithuania is also among the countries allocating a very small portion of R&D expenses to the cost of labour (see Annex 6 and Annex 7). This is the reason why the salaries of researchers are low and inadequate to their professional qualification. This also prevents them from participating in the international initiatives and programmes, since the wages under the international project are determined in the same way as wages paid from the national funds, and such is a common practice. These wages are several times lower than wages of the foreign researchers.
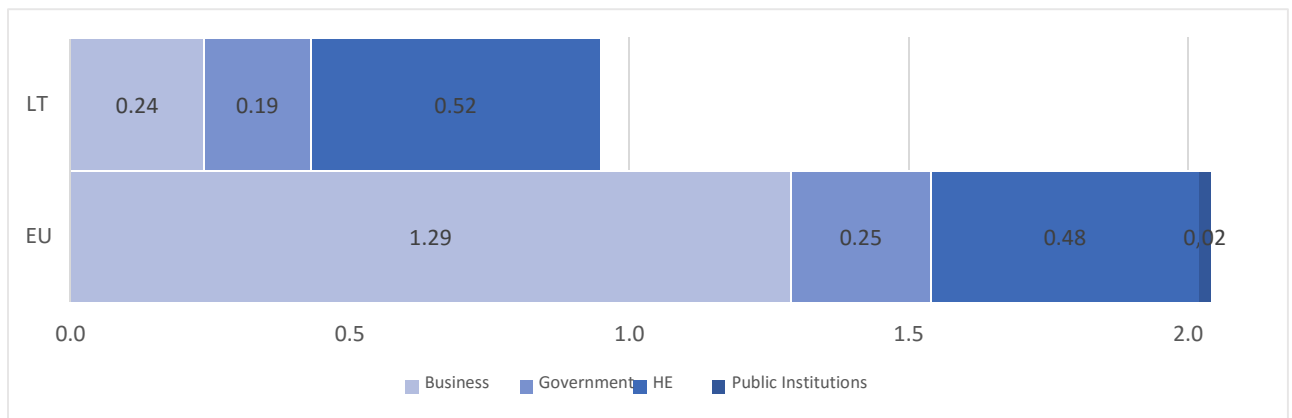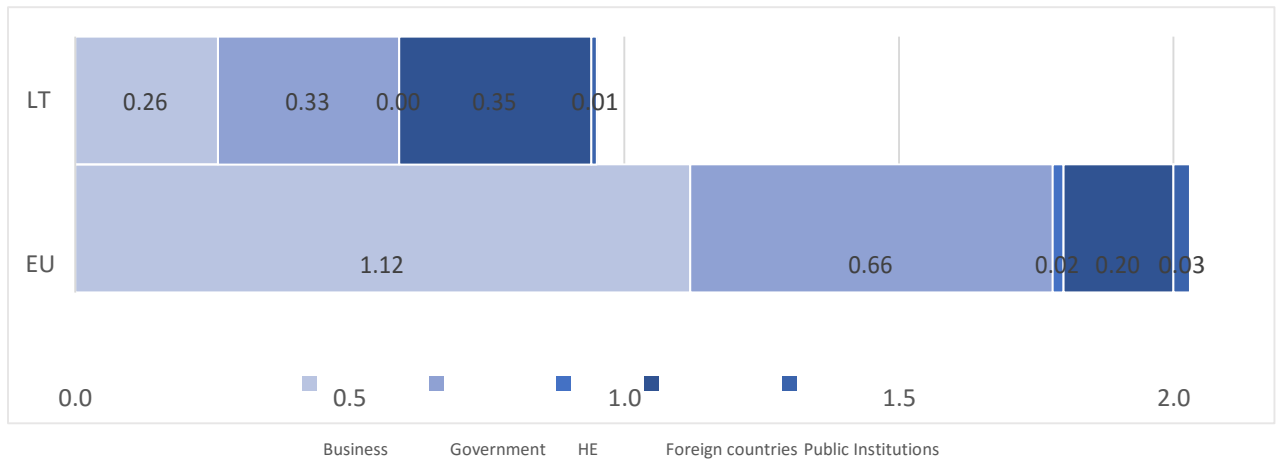
> *Lithuanian spending on R&D (percentage of GDP) is much lower than the EU average. Lithuania is also classified in the group of countries allocating a very small portion of R&D expenditure to labour costs, i.e. wages of researchers are inadequately low compared to their professional qualification.*
>
> *Comparing spending (fund use) on R&D by sectors: in Lithuania, a very small portion of R&D funds, derived from various sources, is spent in the business sector, while much larger portion is spent in the public sector and, comparing by the GDP percentage, the number is close to the EU average.*

However, assessment of the sources of these R&D funds shows (see Figure 18) that business is allocating a very small portion of funds to R&D compared to the EU average (the amount is more than 4 times lower, counting by the GDP portion), the part of funds allocated by the government is only two times lower than the EU average (GDP portion), and only the part of funds coming from abroad is exceeding the EU average, however this is due to the fact that so far substantial funds have been allocated from the Structural Funds (SF). Nevertheless, adding the state budget portion and the SF funds (counted by GDP percentage), the funds derived from these sources still make a smaller part than the average funds allocated from the budget in the EU. The problem of rather small portion of R&D funds being allocated from the Lithuanian state budget is going to be increasingly relevant after the end of the structural support period, as Lithuania is among the three EU countries where the funds from foreign sources exceed the funds allocated by the national government (see Annex 8).

	Business	Government	HE	Foreign countries	Public Institutions
LT	0.26	0.33	0.00	0.35	0.01
EU	1.12	0.66	0.02	0.20	0.03

Data source: Eurostat

Figure 19.   Spending on R&D by the sources of financing, percentage of GDP, Eurostat, 2013

Compared by the sources of financing, the level of funds (by GDP percent) allocated by Lithuanian business and government to R&D is much lower than the EU average.

Possible scenarios of dealing with the main issues (directions)

There are several possible scenarios of dealing with the issues highlighted in the situation overview. Firstly, however, it is necessary, within the scope of the mandates held by public authorities, to introduce compulsory (albeit not optimally sufficient) criteria all higher education institutions (HEIs) need to satisfy, and define the principles for the assessment and funding of studies and R&D that would:

- Organically encourage institutions to reform within the time frame set;
- Lead to improvements in the quality of studies and research;
- Ensure a more effective use of the intellectual and infrastructure potential.

Should there be political will, then several further scenarios are possible.

The implementation of minimum criteria may be distributed over a period of several years.

Scenario one. If the principles discussed earlier are strictly enforced, then over a period of several years institutions themselves, in an attempt to survive, will be forced to review the possibility of the studies they offer, look for ways to attract an effectively working research potential, focus more on increasing the international dimension of their activities, and look for ways to merge with other institutions. This path is based on the existence of strong political will not to compromise with the requirements set or lengthen the terms by which the indicators or criteria set have to be achieved.

Scenario two. Use the same (or slightly softened) criteria and principles, evaluate material already available (information characterising the activities of institutions, conclusions by international experts) and prepare possible scenarios of the HEI reform, discuss those scenarios and, when necessary, consult international experts, decide on the one that will be implemented, adopt appropriate legislation and start implementing the scenario consistently (similarly to stage one of the research institute reform).

Levels of state regulation

Mandates held by public authorities allow the regulation (both regulating <u>and influencing</u>) of the research and higher education system, and individual institutions within the system, on different levels, i.e.:

- Institutional framework level (colleges (of higher education), universities; research institutes):
    - Regulation of their establishment, functioning and reform;
    - External review;
    - Institutional funding (of facilities and administrative functions);
- Study process level:
    - Requirements for the issuance of permits;
    - Requirements for the study process (admission; organisation and delivery of studies);
    - Evaluation of the study process and learning outcomes;
    - System of study funding.
- R&D activity level:
    - Regulation of evaluation;
    - Funding system.

Requirements for HEIs and the reform of HEI evaluation

Firstly, it is necessary to detail what minimum indicators have to be achieved for an institution to be awarded the status of a university or college.

The Lithuanian system of higher education is a binary system therefore there should be a clearer distinction of the roles colleges and universities play domestically.

Universities – intellectual leaders of the country – are the carriers of new (both on national and international level) ideas (for the state, its economy, business, culture, art and other public and civic needs); they educate leaders for society, communities and collectives, managers, experts in different fields of science, art and culture, professional artists, analysts, developers and practitioners of new technologies. Universities deliver high-level research-based studies in three cycles, research results are commercialised and spread among the general population in a variety of ways.

Colleges are regional leaders more focused on tackling the more practical issues of a particular region (including those of the business community) and the training of middle managers and specialists better familiarised with particulars of a specific workplace.

As such, **universities** have to:
- Carry out highly international research;
- Use research results to train specialists (capable of analysing problems in depth, strategizing activities of institutions, departments and groups, and developing possible problem resolution scenarios, etc.). In other words, universities should train leaders for society, communities and collectives, managers, individuals capable of analysing and thinking in a critical and creative manner;
- Use research results to create new research-intensive businesses, educate society, and shape national policies;
- Address issues that are essential to the functioning of the state (economic, social, etc.), work with the business community in tackling scientific problems relevant to businesses (including experimental development).

Colleges have to:
- Train specialists focusing more on specific workplaces (middle managers);
- Help the business community and local government of the region to tackle relevant problems, provide consultations on the introduction and application of innovations.

In light of the tasks set out to institutions, appropriate minimum requirements with regard to their activities should be established.

Minimum requirements for universities:

- **Research level** (evaluated using the criteria applied in international practice). Based on the results of a research assessment exercise (e.g., the same that was done in Lithuania last year), a university has to be recognised as a **Strong International Player** (during the transitional period of 3 years – **Strong National Player**), if research activity received this evaluation in more than half of the scientific fields in which the university carries out research.
    a. The consequence of such an assessment (if a university is assessed as strong in a certain field as a result of the research assessment exercise (at least nationally)) could be the granting of the right to deliver doctoral studies; a university that does not have the right to **deliver doctoral studies** should, over time (in 3 years), loose the right to deliver university studies in the respective field;
    b. At **least half of the scientific academic staff are researchers** (i.e. have an academic degree and are engaged in research), and in the case of art studies – high-level artists respectively;
    c. **R&D infrastructure** has to be used efficiently in carrying out research and be of an international level (expert assessment);
    d. **Revenue from the intellectual activity output and business-science collaboration** should account for at least 5 per cent of the university's revenue.
- The requirement to maintain a certain level of research activity and the requirement to educate leaders for society would organically lead to the requirement for **competence of applicants**, i.e.

admission score of no lower than 3 on a 10-point scoring system,[15] detailed by fields of studies (groups of fields);

- **Study programmes should be delivered in no less than four areas of studies** (accompanied by research in these areas);
- **Infrastructure of studies** should meet the requirements laid down in the descriptions of study fields;
- **Graduate employability**: at least 70 per cent of graduates should be employed in positions requiring a degree from a higher education institution;
- **Share of teachers employed in a second paid job** – no more than 40 per cent;
- **International mobility of students** – 5 per cent.

Minimum requirements for colleges:

- **Graduate employability**: 70 per cent of graduates should be employed in positions requiring a degree from a higher education institution;
- **Teaching relation with business**: 30 per cent of all teachers should have practical work experience (some should have been previously employed in businesses, others – invited representatives of the business community);
- **Study programmes should be aligned with the needs of the region**: employer membership on the study programme (field) committees should be no less than 50 per cent;
- **Infrastructure of studies** should meet the requirements laid down in the descriptions of study fields;
- **Students admitted** should be capable of studying and taking on managerial positions: admission score – 2;
- **Compulsory agreements with employers in the region** for compulsory student placements;
- **Scientific competence of teachers**: teachers teaching theory should be researchers (i.e. hold a degree in science and be engaged in research): 10 per cent. These teachers should carry out research in groups of researchers at universities or research institutes (developing R&D infrastructure in colleges is not a rational decision);
- **Teacher ability to provide consultations to the government and business community of the region** on relevant matters of innovation introduction;
- **Share of teachers employed in a second paid job** – no more than 50 per cent;
- **International mobility of students** – 5 per cent.

WE PROPOSE that:

The Law on Higher Education and Research regulates:
- More detailed definitions of the mission of universities and colleges in society;
- Criteria to assess the compliance of a HEI with its status, criteria for the number of fields in which studies should be delivered; requirements for research level, international dimension of research and studies, mobility, extent of cooperation with business, infrastructure of R&D and studies, competence of prospect students, graduate employability, etc.
- Mandate to the Government or an institution authorised by the Government to establish indicators of the criteria in question.

The Government or an institution authorised by the Government to:
- Establish indicators for the assessment of HEIs;
- Approve a new procedure for the assessment of HEIs which would reflect the coherence between various assessments done by the state, and an effective use of the available data;

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[15] Until 2018, after which date a transition would be made to a new system of applicant selection.

Note. In order to obtain a competition score of 1, it is sufficient to graduate with fours (4) in that particular year and pass at least one state examination (under the previous 5-point scoring system this meant that pupil's performance was unsatisfactory).

> - Update the procedure for granting and assessing the right to deliver doctoral studies, which would allow the determination of the level of research based on the results of a regularly performed international R&D assessment.

Reform of the study programme accreditation process

The reform entails a shift from the evaluation and accreditation of study programmes to the evaluation and accreditation of fields of studies . During the transitional period, an independent commission composed of social stakeholders (mostly from representatives of the business community and associated industry structures, internationally renowned researchers) and formed by the Ministry of Education and Science (MoES), or the Government, assesses the relevancy of the study programmes of different fields offered by every higher education institution against the needs of the labour market (research and experimental development).

The possibility to deliver programmes of a respective study field will be given to the higher education institution if the particular study field is accredited.

In the process of accrediting fields of university studies, **areas of evaluation** (closely linked to the requirements the university has to meet) are:
- **High-level research carried out in a respective scientific area of the study field**
  a. **Research level** has to be recognised as **strong internationally** (during the transitional period of 3 years – strong nationally) based on the results of the research assessment exercise;
  b. At least **half of the scientific academic staff working in the study field are researchers**;
  c. **R&D infrastructure** is sufficient to carry out research of respective level.
- **Infrastructure of studies** has to meet the requirements set out in the descriptions of study fields.
- **The relevancy of studies of that particular field to the labour market and the employability of graduates of the study field**, or, should there be no graduates, the lack of specialists supported by data.
- **Internal quality assurance procedures are in place** and include employers and stakeholders.
- Teaching quality assurance systems (tools) are in place and help to improve and evaluate **didactic** competence of teachers.

> Accordingly, there are requirements for the accreditation of college studies in a respective study field linked to the requirements for colleges.**WE PROPOSE that:**
>
> The Law on Higher Education and Research regulates:
> - A shift to the evaluation and accreditation of study fields.
> - Mandate to the Government or an institution authorised by the Government to prepare the procedure for evaluating and accrediting study fields, and to establish appropriate indicators.
>
> The Government or an institution authorised by the Government:
> - Approves the procedure for evaluating and accrediting studies.
> - Establishes the appropriate indicators by study field with regard to the required level of research, requirements for scientific academic staff, infrastructure of R&D and studies, cooperation with the business community; teaching competences of the academic staff, and graduate employability.
>
> The MoES:
> - Forms an independent commission comprised of social stakeholders (mostly from representatives of the business community and associated industry structures, internationally renowned researchers) tasked with the taking of inventory of the study programmes being implemented and assessing the relevancy (need for) of the study programmes of every higher education institution against the needs of the labour market (research and experimental development).

Funding reform

Funding of studies is reviewed in order to increase the amount of funds allocated per one state-funded spot and disburse these funds only for those studying in a competent environment.

- Funding of studies is allocated based on the scheme of student baskets and bursaries, however:
    a. Student basket or bursary may follow the student to a particular higher education institution only when certain requirements are met, i.e.:

i. HEI applies a minimum admission score to all school graduates wishing to enrol in the HEI;

ii. HEI admits such a number of students to the first cycle studies of the field (programmes) that is no lower than the minimum required given the particulars of the study field (profitability requirement: for studies of physics, biomedicine and technology no less than 30 students; for studies of humanities and social sciences – 60), with appropriate adjustments of the figures given the regional dimension of colleges.

    b. The preliminary number of state-funded spots is determined depending on:

i. The share of graduates of the study field (groups of fields) employed in positions requiring a degree from a higher education institution;[16]

ii. The number of high school graduates for a particular year;

iii. The needs of the state (with an independent from HEIs analysis and justification);

iv. The possibility of HEIs to provide higher education based on its potential (both intellectual and infrastructure).

WE PROPOSE that:

The Law on Higher Education and Research sets out the mandate to the Government or an institution authorised by the Government to establish:

- The conditions under which, if met, state funding may be allocated (student baskets, bursaries) to a higher education institution (minimum competence of applicants by study fields; minimum numbers of students to be admitted to the study field (programme) so that profitability of studies is ensured).
- The number of state-funded spots, but only having evaluated the share of graduates of the study field actually employed in positions requiring a degree from a higher education institution (in the case of colleges, based on the share of graduates doing work that matches their degree), possibilities provided of the potential available.

The Government or an institution authorised by the Government:

- Updates the procedure for allocating student baskets and bursaries.
- Approves a procedure for determining (justifying) the number of state-funded spots.

Basic funding:

- The share of disbursements from the budget for facilities and administrative functions is included in the student basket and is earmarked depending on the funds allocated for basic R&D funding (to give the opportunity for HEIs to reform themselves, a transitional period of up to 2 years may be set during which a combined fund allocation for these purposes would be possible).
- Basic R&D funding is allocated (two thirds (depending on the research area)) based on the results of an international research assessment exercise done every 5 years (R&D level, management, infrastructure, etc.) and (one third) based on the results of R&D for the past three years assessed using bibliometrics, contract values, grants under international R&D programmes. In the case of the assessment based on bibliometrics a greater correlation is made with:
    a. The level of scientific work published (falls in the share of 10 per cent of the most cited publications).
    b. The extent of international cooperation (co-publications; joint R&D projects with foreign partners).

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[16] For example, there would be no changes to the numbers, if 80 per cent meet this requirement. It is worth analyzing the case that in college studies no less than 70 per cent of graduates are employed in positions matching their degree within a period of less than 12 months.

  c. The extent of research done in conjunction with the private sector (co-publications, joint R&D projects).

- If a plan for the reform of the national research and higher education institution network is drafted, the methodology may specify additional principles for allocating funds from the budget (e.g., basic R&D funding may not be allocated if, in a certain field, the group of researchers working at the institution is smaller than a certain number of individuals[17]).
- Funds from the national budget and ESF funds for infrastructure are allocated in accordance with the principles established (based on performance or goals of the national strategic documents (e.g., network reform plan)).

WE PROPOSE that:

The Law on Higher Education and Research regulates:
- Funds allocated to facilities and administrative functions are included in the student basket and allocated in proportion to basic funding for R&D.

The Government or an institution authorised by the Government:
- Specifies the methodology of funding of studies (allocation of the student basket and bursaries) and includes funds allocated to facilities and administrative functions into the student basket.
- Specifies the methodology of R&D funding establishing that basic R&D funding is allocated in light of the results of the annual bibliometric assessment and international research assessment exercise (done every 5 years).

The MoES:
- Specifies the methodology for assessing R&D work and provides for incentives for highly international R&D (for publications falling in the 10 per cent share of the most cited publications), international cooperation (for co-publications with foreign partners, joint R&D projects with foreign partners), cooperation with the private sector (for co-publications more focused on R&D contracted by economic operators, business-science R&D projects).
- Approves the methodology for international research assessment exercise (done every 5 years).
- Simplifies (standardises by reducing the red tape) the collection of information from public authorities required for the assessment of R&D (annual R&D assessment; research assessment exercise, R&D assessment in order to grant the right to deliver doctoral studies or to evaluate the quality of doctoral studies, R&D assessment during external review) which is currently done for different purposes, at different times and in different forms.

Competitive funding

The Research Council of Lithuania (RCL) is reformed drawing on the conclusions and recommendations of the external evaluation of the RCL done by the European Science Foundation (ESF):
- The chairman of the RCL is a single-person management body and as such should be delegated more functions related to the coordination of RCL activities and reporting. The chairman has three deputies, i.e. for strategy (responsible for the R&D funding strategy), for science (responsible for the assessment of R&D in terms of its content), and for administration (or activities of the fund).
- It is proposed to review in essence the principles for the formation of scientific committees of the Council and their functions, and form a new Strategic Committee of the RCL that would perform, in a more active manner, the function of the RCL of a strategic advisor on policies of science and researcher training. This committee would be responsible for:
  - a. The drafting of strategic documents governing activities of the RCL (action plan, budgets, work regulation, principles of expert and expert group appointment, organisation of their work and remuneration etc.).
  - b. The drafting of the list of competitive R&D funding schemes for a particular year and the allocation of funds by activities of the RCL.

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[17] Argument: the state does not incentivise the scattering of R&D intellectual and infrastructure potential.

    c. The drafting of the procedure for the avoidance of interests of conflicts.

    d. The performance of expert functions related to the R&D policy making.

Since the main activities of the RCL are executive-level activities (to fund specific R&D projects, select topics for national research programmes, etc.), the functions of its founder should be carried out by the Government or an institution authorised by the Government.

WE PROPOSE that:

The Law on Higher Education and Research regulates:

- The Government approves the regulations of the RCL.

The Government or an institution authorised by the Government:

- Approves the new regulations of the RCL that would, in addition to scientific committees, provide for the establishment of the Strategic Committee and specify the principles for committee formation, functions and responsibilities of the committees, their role in developing national research programmes by topics specified by public authorities, determining the possibilities of funding scheme consolidation and mandatory engagement of foreign experts in project assessment, and strengthening the role of the RCL foundation.

Funding volumes and effectiveness

The share of R&D funds from different sources spent through the public sector and calculated as a percentage of GDP is similar to the EU average, therefore it is necessary to find ways to encourage businesses to strengthen their R&D capacities and R&D funding and the Government to focus more on R&D and better R&D funding, and in parallel look for ways of more effective use of these funds.

WE PROPOSE that:

The Law on Higher Education and Research regulates:

- The possibility of joint doctoral studies with the business community.

The Government:

- Reviews the measures promoting increases in R&D capacities of businesses:
    - Support to the birth of new research-intensive business;
    - Strengthening of the ability of research and higher education institutions to commercialise research results;
    - Approval of the regulations for joint doctoral studies with business;
- Concentrates R&D potential so that budget allocations to R&D are used more effectively, and increases the attractiveness of Lithuania to foreign investments by research-intensive businesses;
- Reviews the possibilities to allocate more budget funds to R&D both in the public sector and in business.

Preparation of the HEI reform (scenario two)

As mentioned before going into details of the possible ways to address the issues identified, there is another scenario possible, which does not involve waiting that, following the introduction of the suggested schemes for the evaluation and funding of research and studies, higher education institutions would start looking for ways to consolidate, and that is to start developing possible scenarios for the HEI reform now. This option would be more effective as it would allow saving some of the resources (before institutions make the decision to reform once the situation becomes too severe), would not mislead young people because of the poor quality higher education provided to them and would allow time saving in starting to raise the international competitiveness of both Lithuanian research and higher education system and the country.

<u>Reform of the network of state universities</u>

In the light of the above listed criteria and additional criteria for the effective use of national budget funds and effective use of the intellectual potential available,[18] a number of scenarios for the reform of the universities network may be developed.

WE PROPOSE that:

Firstly, it is essential that the information derived from a variety of previous assessments is used to make snapshots against the criteria previously listed and the following evaluations are made:

- Current compliance of universities with minimum requirements;
- Distribution of research potential in universities (and institutes) by scientific areas;
- Distribution of studies among universities (by fields and number of students);
- Coherence between the studies offered and research potential available;
- Compliance of the distribution of studies with profitability criteria.

The MoES should use these snapshots and develop the possible scenarios of the HEI network reform taking into account the decreasing numbers of students.

If the Government approves a specific scenario, that scenario is then submitted to the Seimas for the latter's approval.

If the Seimas approves a specific scenario:

- The MoES prepares draft preliminary reform plans involving mergers of institutions and covering their structure, main directions of activities, strategy for accumulating potential, etc.
- If the Government approves these drafts, then working groups are formed to detail these plans;
- Drafting (working groups, the MoES, the Government) and adoption (the Seimas) of legislation regarding the establishment of new universities (or reorganisation or merger (subordination) of the existing ones) and implementation of the reform plans;
- Implementation of the reform plans.

Additional budget and SF funds should be allocated to institutions that satisfy the above-mentioned criteria or undergo the reorganisation in accordance with the universities network reform plans.

Review of the state research institute network

Given that the first attempts of concentrating the potential of research institutes made back in 2009 did not include institutes of humanities and in the light of the Research Assessment Exercised[19] organised by MOSTA (Research and Higher Education Monitoring and Analysis Centre) in 2015, National Audit Report by the National Audit Office 'The Evaluation of the management, use and disposal of national long-term assets by state research institutes'[20] (2015) as well as a study done by the RCL on Humanities and Social Sciences, draft proposals regarding the possibilities to consolidate institutes of humanities have to be made.

WE PROPOSE that:
The MoES develops a draft resolution of the Government on the reorganisation of institutes of humanities.

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[18] Provided there is political will.
[19] Source: Mokslinės veiklos palyginamasis tyrimas, Humanitarinių mokslų srities vertinimo ataskaita, MOSTA, 2015. (www.mosta.lt/images/vertinimas/Bachmarkingo_ataskaitos/research_assessment_exercise_humanities.pdf).
[20] Source: Valstybinių mokslinių tyrimų institutų valstybės ilgalaikio turto valdymo, naudojimo ir disponavimo juo vertinimas, Valstybės kontrolė, 2015. (www.vkontrole.lt/failas.aspx?id=3377).

Annexes

Annex 1. Student mobility under the *Erasmus* Programme

Year	Outgoing Erasmus students	Incoming Erasmus students
2013-2014	-3420	2359
2012-2013	-3529	2147
2011-2012	-3548	1603
2010–2011	-3417	1373
2009–2010	-3002	1339
2008–2009	-3000	1241
2007–2008	-2653	1112
2006–2007	-2082	1008
2005–2006	-1910	628
2004–2005	-1473	414
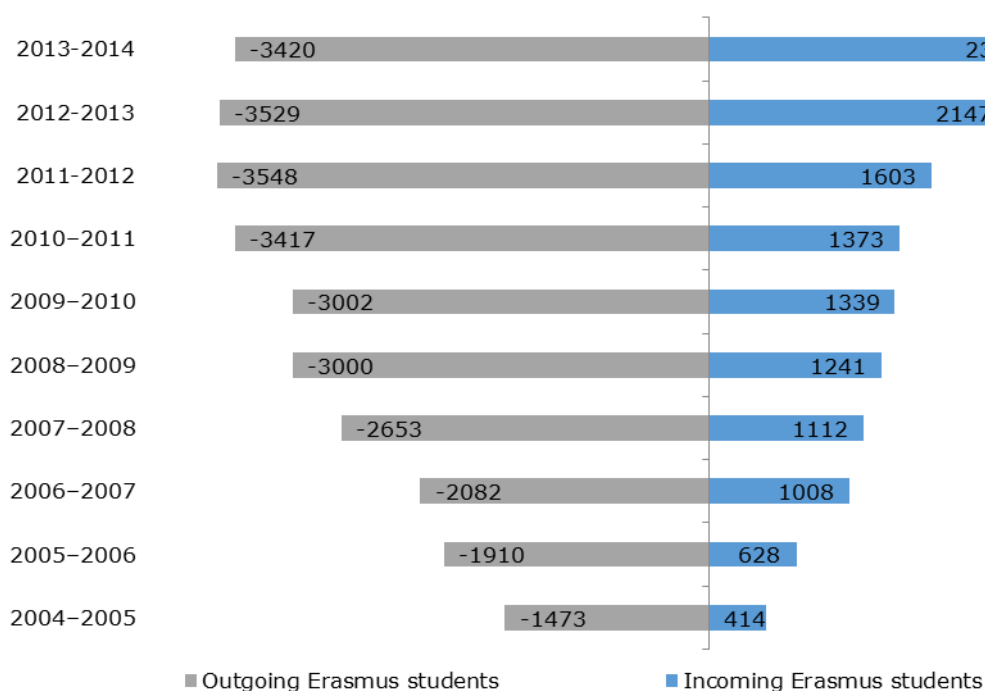
Source: The Education Exchanges Support Foundation

Annex 2. The number of HEIs' outgoing and incoming Erasmus staff mobility for periods of teaching and training

Outgoing Erasmus staff mobility	Incoming Erasmus staff mobility
-1862	1262
-1307	1376
-1344	1153
-1292	1043
-1172	892
-1123	734
-983	768
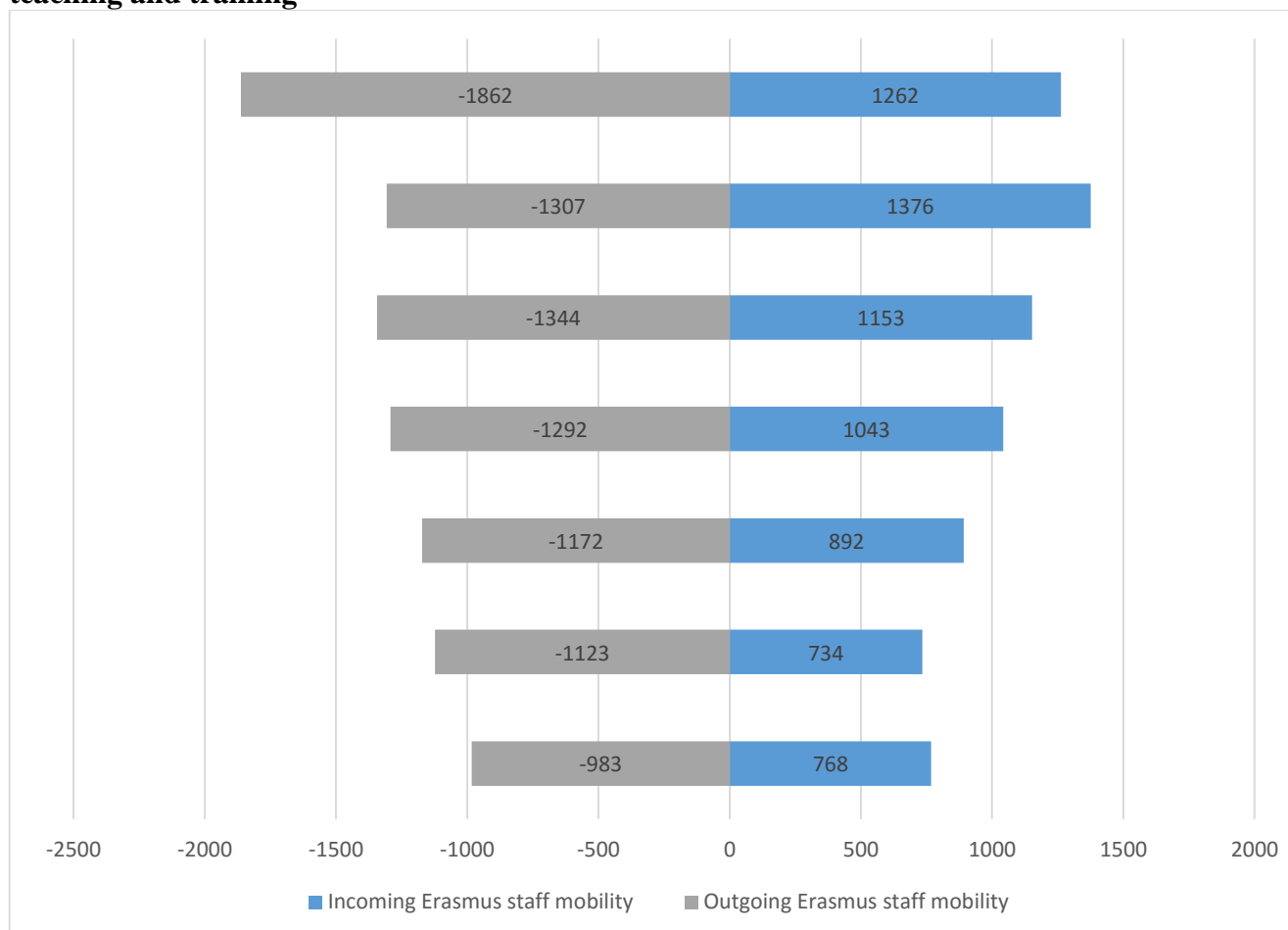
Source: The Education Exchanges Support Foundation

Annex 3. Comparison of universities by research quality

| University	Unit of assessment	Group of assessment	Research quality	Number of contractual researchers as of 31/03/2014	Acquired doctoral degree over 2011-2013
Aleksandras Stulginskis University (ASU)	ASU Agronomy	A	3	18	12
	ASU Biosystems Engineering	T1	3	36	20
	ASU Economics and Management	S1	2	9	6
	ASU Forestry and Ecology	A	3	18	10
ISM University of Management and Economics (ISM)	ISM Academic Staff (Social Sciences)	S1	3	16	8
Kazimieras Simonavičius University (KSU)	KSU	S1	1	5	0
Kaunas University of Technology (KUT)	KUT Chemical Technologies	T1	2	16	1
	KUT Sustainable Chemistry	P	3	40	10
	KUT Sustainable Civil Engineering and Architecture	T1	2	48	13
	KUT Economics and Business	S1	2	51	24
	KUT Electricity and Electronics	T2	2	57	21
	KUT Manufacturing Technologies and Design	T1	3	34	17
	KUT Natural Sciences and Materials Science	P	3	33	13
	KUT Informatics	T2	3	52	13
	KUT Food Science and Technologies	T1	3	27	9
	KUT Measurements Technology	T2	3	19	8
	KUT Mechanical Engineering	T1	3	25	19
	KUT Social Sciences, Humanities and Arts	H	3	55	9
Klaipėda University (KU)	KU Institute of Baltic Region History and Archaeology	H	4	20	2
	KU Faculty of Humanities	H	2	31	2
	KU Joint Division of Marine Sciences and Technology Sciences	B1	4	77	5
	KU Joint Division of Social Sciences	S1	1	44	6
	KU Faculty of Health Sciences	B2	3	24	0
Lithuanian University of Educational Sciences (LUES)	LUES Natural Sciences	P	3	23	2
	LUES Lithuanian Philology	H	3	34	3
	LUES Education	S1	3	68	27
The General Jonas Žemaitis Military Academy of Lithuania (MAL)	MAL Humanities: Centre of Military History of the Institute of Military Science (KMI KIC); Department of Humanities	H	1	3	0
	MAL Social Sciences: Centre of Strategic Research of the Institute of Military Science (KMI STC); Department of Political Science; Department of Management	S2	2	11	0
	MAL Technology Sciences: Centre of Military Technology of the Institute of Military Science (KMI KTC); Department of Engineering	T2	1	5	0

	Management				
Lithuanian Academy of Music and Theatre (LAMT)	LAMT Lithuanian Academy of Music and Theatre	H	2	24	5
Lithuanian University of Health Sciences (LUHS)	LUHS Behavioural Medicine Institute	B2	3	14	4
	LUHS Institute of Endocrinology	B2	2	10	5
	LUHS Faculty of Pharmacy	B2	3	21	7
	LUHS Institute of Animal Science	A	2	17	1
	LUHS Faculty of Animal Husbandry Technology	A	2	22	10
	LUHS Institute of Cardiology	B2	4	36	14
	LUHS Faculty of Medicine (Fundamental Medicine)	B2	4	29	8
	LUHS Faculty of Medicine (Clinical Medicine)	B2	4	101	54
	LUHS Faculty of Medicine (Social Sciences and Humanities)	H	1	11	0
	LUHS Neuroscience Institute	B2	4	30	5
	LUHS Faculty of Odontology	B2	2	26	10
	LUHS Faculty of Nursing	B2	3	18	6
	LUHS Faculty of Veterinary Medicine	A	3	43	14
	LUHS Faculty of Public Health	B2	3	32	12
Lithuanian Sports University (LSU)	LSU Faculty of Sport Biomedicine	B2	4	28	15
	LSU Faculty of Sport Education	S1	3	20	6
	LSU Institute of Sports Science and Innovations	B2	4	19	12
Mykolas Romeris University (MRU)	MRU Faculty of Economics and Finance Management	S1	2	29	1
	MRU Faculty of Politics and Management	S1	3	25	18
	MRU Faculty of Politics and Management, Institute of Humanities	H	2	22	0
	MRU Faculty of Social Welfare	S2	3	40	6
	MRU Faculty of Law	S2	2	44	46
	MRU Faculty of Public Security	S2	1	15	0
Šiauliai University (ŠU)	ŠU Educational Field	S1	3	32	13
	ŠU Physical Sciences	P	2	9	0
	ŠU Humanities	H	2	18	6
	ŠU Biomedicine and Agriculture Sciences	B1	2	8	0
	ŠU Economics and Management	S1	2	25	0
	ŠU Technology Sciences	T2	1	15	0
Vilnius Academy of Fine Arts (VAFA)	VAFA Humanities Unit of Assessment	H	3	22	14
Vytautas Magnus University (VMU)	VMU Biomedicine Science Area	B1	4	13	8
	VMU Fields of Economics and Management Sciences	S1	2	6	25
	VMU Field of Philology Science	H	4	13	6
	VMU Fields of Philosophy and Ethnology Sciences	H	2	9	14
	VMU Physical Sciences Area	P	3	14	13
	VMU History Science Field	H	3	11	11
	VMU Art Science Field	H	4	8	7
	VMU Political Science Field	S2	3	11	11

	VMU Social Sciences	S2	2	31	20
	VMU Technology Science Area	T1	3	10	1
	VMU Law Science Field	S2	2	4	2
	VMU Theology Science Field	H	3	4	4
Vilnius Gediminas Technical University (VGTU)	VGTU Faculty of Environmental Engineering	T1	3	50	29
	VGTU Faculty of Architecture	H	3	15	7
	VGTU Faculty of Electronics	T2	3	22	21
	VGTU Faculty of Fundamental Sciences	T2	3	53	23
	VGTU Faculty of Creative Industries	S1	1	12	0
	VGTU Faculty of Mechanics	T1	3	19	5
	VGTU Faculty of Civil Engineering	T1	3	46	18
	VGTU Research Institute of Thermal Insulation	T1	2	19	2
	VGTU Transport Engineering	T2	3	21	17
	VGTU Faculty of Business Management	S1	2	19	17
Vilnius University (VU)	VU Institute of Biochemistry	P	3	61	10
	VU Institute of Biotechnology	P	3	102	11
	VU Faculty of Chemistry	P	4	34	29
	VU Faculty of Economics	S1	2	24	27
	VU Faculty of Philosophy (1)	H	4	10	7
	VU Faculty of Philosophy (2	S2	3	23	28
	VU Faculty of Physics	P	4	92	45
	VU Faculty of Natural Sciences - BIO	B1	3	49	30
	VU Faculty of Natural Sciences - GEO	P	2	14	22
	VU Faculty of History	H	4	27	14
	VU Language and Literature	H	4	60	29
	VU Kaunas Faculty of Humanities (1)	H	3	13	16
	VU Kaunas Faculty of Humanities (2)	S1	2	11	11
	VU Faculty of Communications	S1	2	8	16
	VU Faculty of Mathematics and Informatics	P	4	39	30
	VU Institute of Mathematics and Informatics	P	3	51	27
	VU Faculty of Medicine	B2	4	153	73
	VU Institute of Applied Sciences	P	3	37	10
	VU Institute of International Relations and Political Sciences	S2	2	10	22
	VU Faculty of Law	S2	2	17	35
	VU Institute of Theoretical Physics and Astronomy	P	4	50	4
International Business School at Vilnius University (IBS VU)	IBS VU Public undertaking International Business School at Vilnius University (field of social sciences)	S1	2	7	0

Source: MOSTA, HE comparative analysis

Annex 4. Public spending (from national and municipal budgets) on higher education as a percentage of GDP (ISCED ED 5–8)
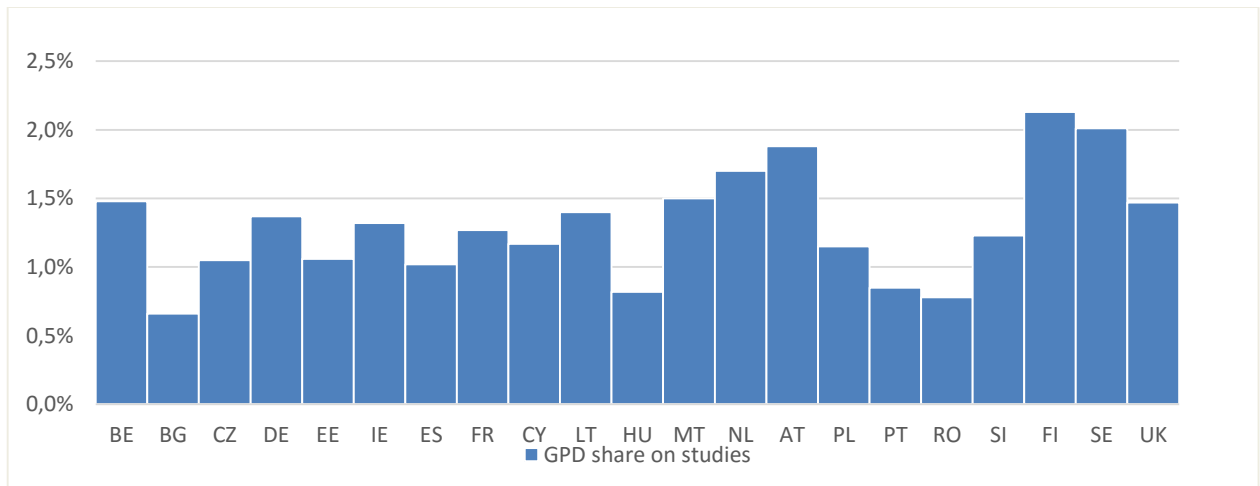
Source: Eurostat (2012)

Annex 5. Change in the total gross R&D expenditure as a percentage of GDP
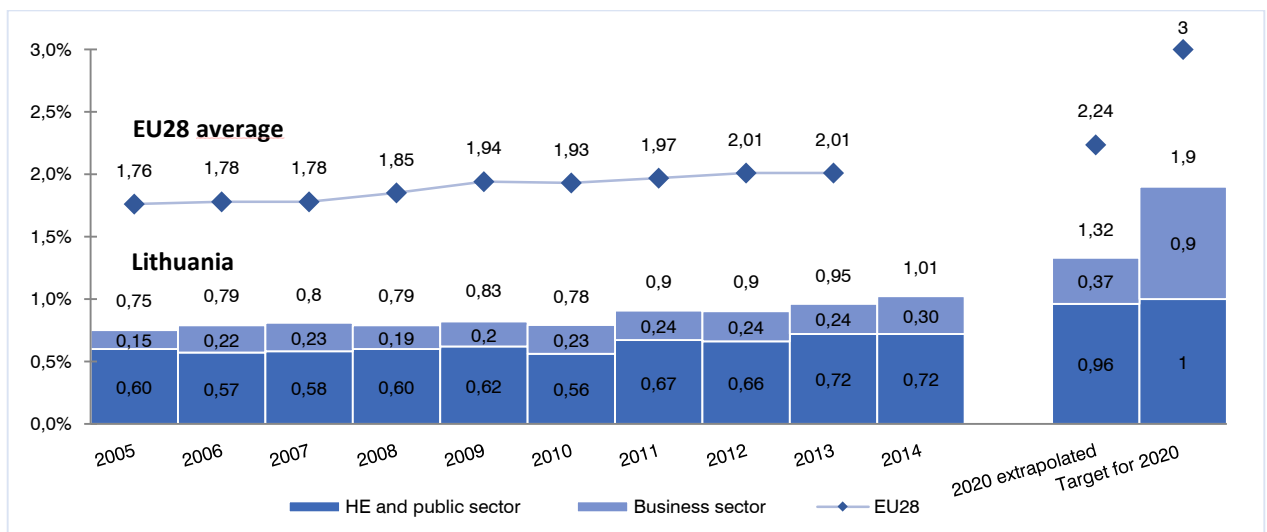
Sources: Eurostat, Lithuanian Statistics, Ministry of Finance
Calculations: MOSTA

Annex 6. Share of R&D expenditure on labour costs

Source: Eurostat (2013)

Annex 7. Share of R&D expenditure on labour costs in Lithuania

Source: Eurostat

Annex 8. R&D expenditure by sources of funding in 2013

Annex 9. Research activity fragmentation by universities and units of assessment[21]

The size of a circle reflects cotractual staff in R&D (doctoral students excluded).

Number menas the overall assessment

Annex 10. Research fragmentation by universities and units of assessment[22]

Faculty of Medicine — 4

Institute of Theoretical Physics and Astronomy — 3

Faculty of Mathematics and Informatics — 3

Institute of Applied Sciences — 4

Faculty of Chemistry — 3

Faculty of Physics — 4

Faculty of Natural Sciences-BIO — 3

Institute of Biotechnology — 4

Faculty of Natural Sciences-GEO — 3

Institute of Mathematics and Informatics — 2

Institute of Biochemistry — 2

Kaunas Faculty of Humanities (1) — 3

Faculty of History — 4

Language and Literature — 4

Faculty of Phylosophy (1) — 3

Institute of International Relations and Political Sciences — 3

Faculty of Phylosophy (2) — 3

Faculty of Economics — 2

Faculty of Communications — 2

Kaunas Faculty of Humanities (2) — 2

Faculty of Law — 2

KTU

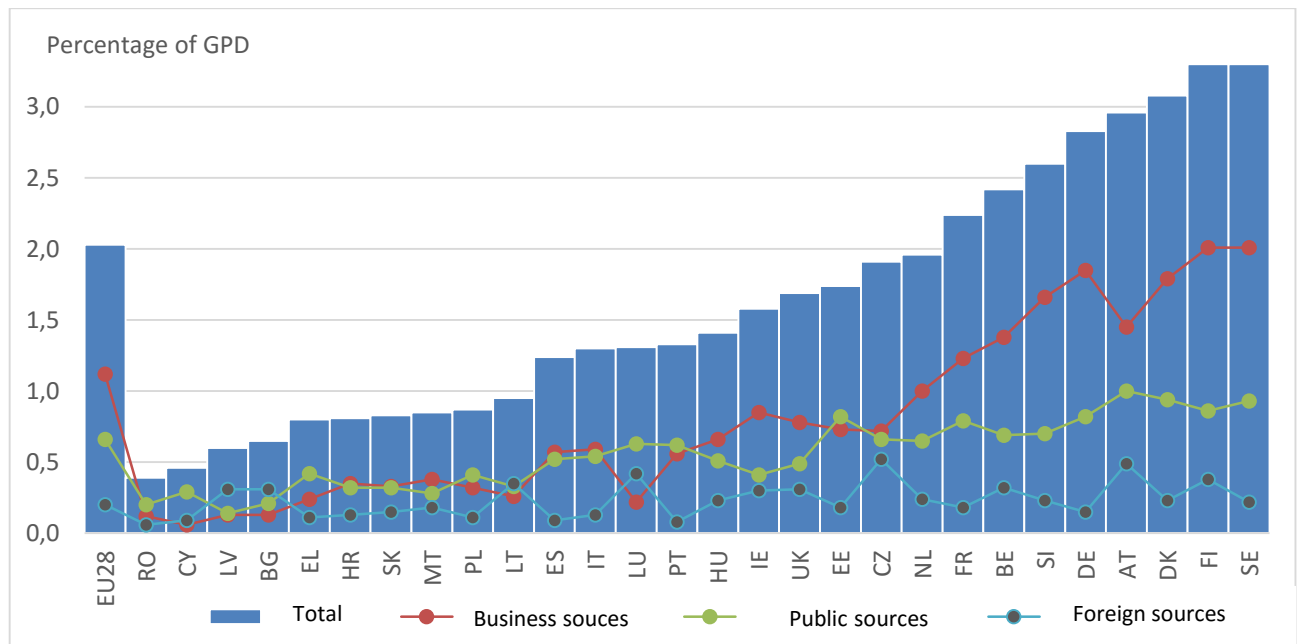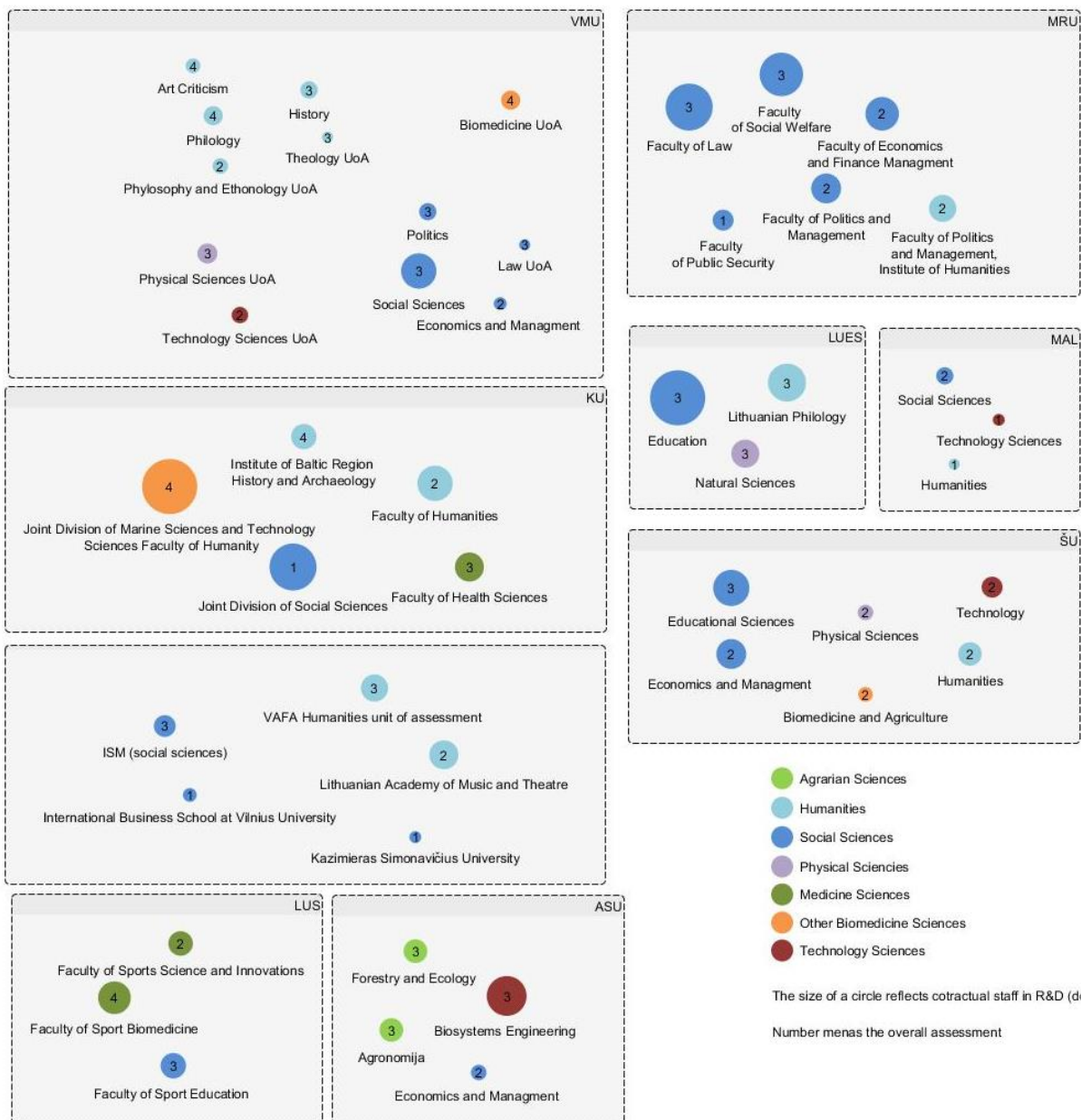Electricity and Elektronics — 3

Informatics — 3

Manufacturing Technologies and Design — 3

Measurements Technology — 4

Food Science and Technologies — 3

Chemical Technologies — 2

Machanical Engineering — 3

Sustainable Civil Engineering and Architecture — 2

Economics and Businees — 2

Sustainable Chemistry — 3

Natural Sciences and Materials Science — 4

Social Sciences, Humanities and Arts — 3

VGTU

Faculty of Environmental ngineering — 3

Faculty of Civil Engineering — 3

Faculty of Electronics — 3

Faculty of Fundamental Sciences — 3

Transport Engineering — 3

Research Institute of Thermal Insulation — 2

Faculty of mechanics — 2

Faculty of Architecture — 3

Faculty of Creative Industries — 1

Faculty of Business Managment — 2

LUHS

Faculty of Pharmacy — 3

Faculty of Medicine (Fundamental Medicine) — 3

Faculty of Animal Husbandry Technology — 2

Faculty of Nursing — 3

Institute of Animal Science — 2

Neurosience Institute — 4

Faculty of Public Health — 4

Faculty of Medicine (Clinical Medicine) — 4

Faculty of Veterinary Medicine — 3

Institute of Cardiology — 4

Behavioural Medicine Institute — 2

Faculty of Odontology — 1

Institute of Endocrinology — 2

Faculty Medicine (Social Sciences and Humanities) — 1

Agrarian Sciences
Humanities
Social Sciences
Physical Sciences
Medicine Sciences
Other Biomedicine Sciences
Technology Sciences

The size of a circle reflects contractual staff in R&D (doctoral students excluded).
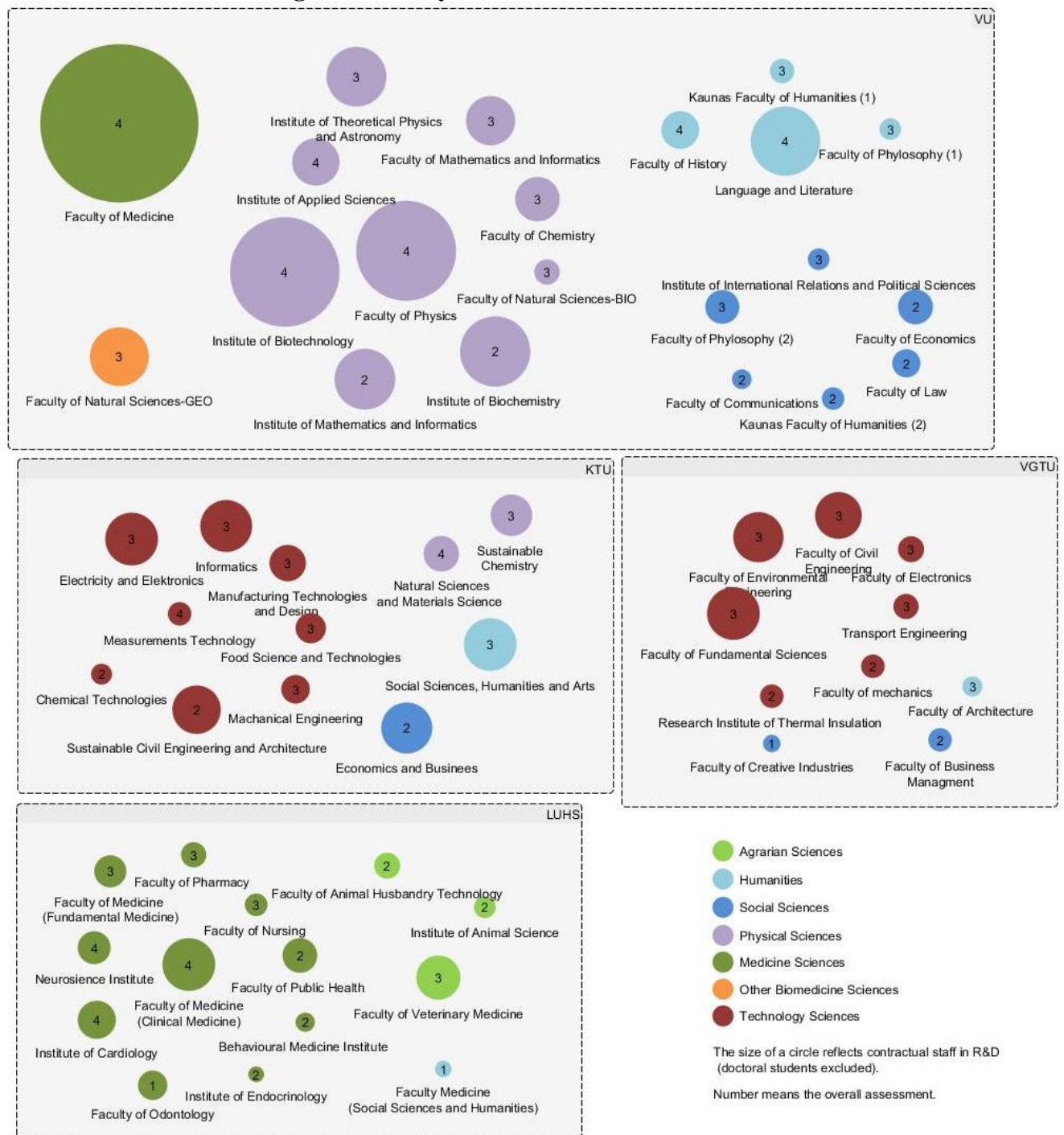
Number means the overall assessment.

[22] Assessment score: 1 – Poor National Player, 2 – Satisfactory National Player, 3 – Strong International Player with some International Recognition, 4 – Strong International Player, 5 – Global Leader.
Source: Mokslinės veiklos palyginamasis tyrimas, MOSTA, 2015.
(www.mosta.lt/lt/mokslines-veiklos-palyginamasis-tyrimas/ataskaitos).