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RIO Country Report 2017: Latvia

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RIO Country Report 2017

The R&I Observatory country report 2017 provides a brief analysis of the R&I system covering the economic context, main actors, funding trends & human resources, policies to address R&I challenges, and R&I in national and regional smart specialisation strategies. Data is from Eurostat, unless otherwise referenced and is correct as at January 2018. Data used from other international sources is also correct to that date. The report provides a state-of-play and analysis of the national level R&I system and its challenges, to support the European Semester.

Summary

Gross Expenditure on R&D in 2016 in Latvia decreased quite significantly both in absolute terms and relative to GDP (from 0.63% in 2015 to 0.44% of GDP in 2016). As R&D investment in Latvia is very strongly dependent on EU funding, this drop can be explained by the downturn in the EU funding cycle but also because the government did not increase national funding as it was planned in the STDI policy guidelines. The share of high-tech firms in the economy is small and the private sector's demand for R&D activities is therefore low. Although tax incentives for R&D investment exist, the take-up has been low. In the context of the recent reform of the tax system, the current R&D tax incentive will be replaced by a zero tax regime on re-invested profits.

Challenges for R&I policy-making in Latvia

***Insufficient supply of human capital for science and innovation**:* this relates not only to the number of people, but also to the relevance of their knowledge. The main public policy initiatives related to this challenge are the introduction of performance-related components in higher education financing and study programme licensing and accreditation. In addition, in 2017 the Ministry of Education and Science initiated steps to ensure that the development of higher education and science is in line with industry needs. Mandatory state exams in natural sciences were also introduced.

***Fragmented public research and education system**:* a high level of fragmentation exists both in terms of the high number of institutions and their geographical dispersion. The most notable policy response to this challenge has been the consolidation process of the Latvian higher education system through base financing allocation. In 2017, the process continued by closing one HEI – Riga Teacher Training and Educational Management Academy which became part of University of Latvia. However, further consolidations are not envisaged in the near future.

***Lack of demand-side policy measures for the creation and stimulation of markets**:* Demand-side innovation promotion instruments such as public procurement for innovation and pre-commercial procurement are largely absent in Latvia, which significantly influences innovation performance of both the public and the private sector. Recent amendments to the Law of Public Procurement made it easier to involve external evaluation experts and decreased the level of bureaucratic costs of R&I performers.

***Limited effectiveness and efficiency of the RD&I funding system**:* insufficient funding, lack of trust between stakeholders (agencies, scientists and universities), low risk tolerance of the agencies managing EU funding schemes and the practice of excessive programme framing and reporting requirements for R&D performers limit further efficiency improvements in RD&I funding. Some programmes (e.g. *Competence Centres*) have already been reformed by delegating part of project selection and evaluation to competence centres themselves, which by design are managed by industry leaders. In addition, the managing authorities are adopting a new approach to risk management by requesting only a fraction of the documents for review.

Main general policy developments in 2017

- *The Law on Support of Start-up Activity* entered into force aiming to create a tax regime that will stimulate the growth of innovative Latvian start-ups by introducing favourable income and social taxation of highly qualified employees.

- *A tax reform package* consisting of 11 regulatory reform proposals was adopted, including introducing a progressive personal income tax, increasing the minimum wage and amending the corporate income tax by applying no taxes to reinvested profits.
- *Implementation of a new national support measure "Portfolio guarantees"* aiming to improve access to finance for SMEs, support the creation of new enterprises and the expansion of existing ones.

Smart Specialisation Strategy Monitoring and Implementation

According to the Smart Specialisation Strategy Monitoring System Report (2014), the RIS3 monitoring system in Latvia revolves around three monitoring levels: the overall goals of the specialisation strategy, macro- and micro-level indicators. It was designed in such a way so that it would be more likely to capture the broad scope of the potential impact of public investment in science, technology development and innovation.

In February 2017, the government decided not to dedicate a separate budget for the RIS3 monitoring system (as was initially planned in 2015) arguing that the financing for the Smart Specialization monitoring system and related activities is included in various EU Structural Funds support programmes.

There is one main EU Structural Funds Programmes for Research and Innovation for the period of 2014-2020 that is directly targeted at promotion of RIS3 fields (total budget of €115.3m). In addition, many other state budget and EU funds financed programmes, aimed at RIS3 facilitation, contribute to achieving RIS3 micro level indicators. However, the planned outcome indicators (e.g. investment in R&D as a percentage of GDP, private sector investments in R&D, the number of R&D personnel) may not be achieved by the current policy mix indicating a need for a revision of incentives created by the programmes.

The first RIS3 monitoring report has been published in 2017. Three indicators were concluded to have improved in the informative report: the number of papers published in international databases, the proportion of population (aged 30-34 years) having higher education and the smaller number of state financed scientific institutions (due to the consolidation process). Most of the indicators related to RIS3 goals, however, showed either slight improvements and were assigned a "steady" status, or decreased.

Foreword

The R&I Observatory country report 2017 provides a brief analysis of the R&I system covering the economic context, main actors, funding trends & human resources, policies to address R&I challenges, and R&I in national and regional smart specialisation strategies. Data is from Eurostat, unless otherwise referenced and is correct as at January 2018. Data used from other international sources is also correct to that date. The report provides a state-of-play and analysis of the national level R&I system and its challenges, to support the European Semester.

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1 Economic context for R&I

In Latvia, 2016 was a year of slowed economic growth (2.2%) caused by lower investment levels, especially in the construction sector (ESTAT data, 2017). However, thriving consumption, greater foreign demand and a strong rebound in investment (partly due to resumption of EU-funded projects) is forecasted to push Latvia's GDP growth to above 4% in 2017.[1]

According to the EC Autumn 2017 economic forecast[2], once the initial boost from the investment recovery in 2017 fades, growth will slow down but remain over 3% in 2018 and 2019, due to strong consumption and improving external demand. Household consumption is forecast to remain solid at the backdrop of rapidly rising wages, which will simultaneously translate into higher inflation. Tax cuts are expected to contribute to the rising domestic demand in 2018, but are unlikely to impact growth in 2019. The shrinking labour force will continue to drive down the unemployment rate, which is set to decline to 7.3% by 2019. The diminishing labour force therefore exerts strong pressure on wage growth, which will be further boosted by a planned substantial increase in the minimum wage.

The forecast expects the government deficit to be 0.9% of GDP in 2017 and 1% in 2018. The deficit increase is fuelled by tax cutting measures but the revenue loss associated with the transition to a new corporate income taxation system is largely shifted out to 2019. The government debt is expected to fall to 39% of GDP in 2017 and should decline further to about 36% of GDP in 2018 and 2019.

As indicated by the European Innovation Scoreboard (EIS)[3] assessment, Latvia's innovation system performance falls into the "Moderate Innovator" category as of 2015. In 2016, EIS Summary Innovation Index for Latvia was 58.1 (benchmark - EU28 average in 2010=100) ranking it 24th out of 28 EU member states in innovation performance.

According to the Central Statistical Bureau of the Republic of Latvia, for most of the period from 2006 to 2014 the industrial sector had a bigger share of innovative enterprises (as percentage of total enterprises in the sector) than the service sector (Figure 1). The exception is the period from 2010 to 2012, when the share of innovative enterprises in the service sector was 31.4%, 2.1% higher than the share in the industry sector. Throughout the entire period, the share of innovatively active firms in manufacturing – a subset of the industry sectors - slightly exceeded the average of all industrial sectors.

The same data also indicates that the most prominent type of innovative enterprises during the period 2012-2014 in all sectors was non-technological (market and organisational) innovators (Figure 2).

[1] ECFIN Autumn 2017 Economic Forecast
[2] https://ec.europa.eu/info/sites/info/files/economy-finance/upd_ip063_en.pdf
[3] http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_en

Figure 1. Share of innovative enterprises by sector as percentage of total enterprises in the sector.

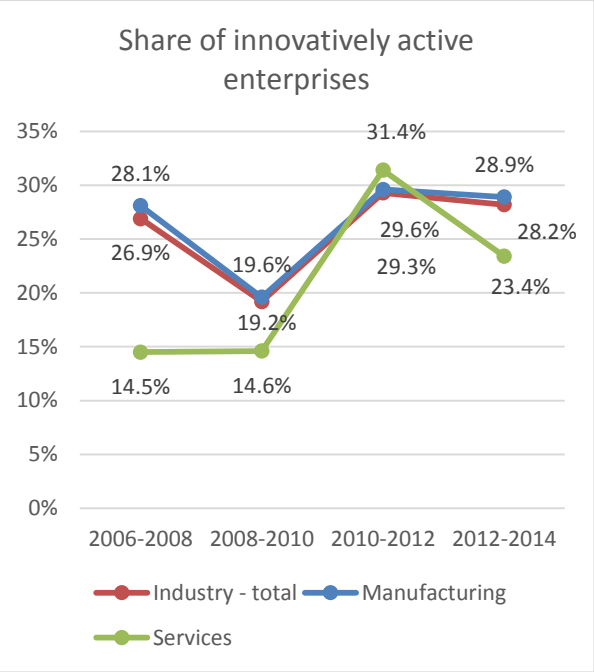
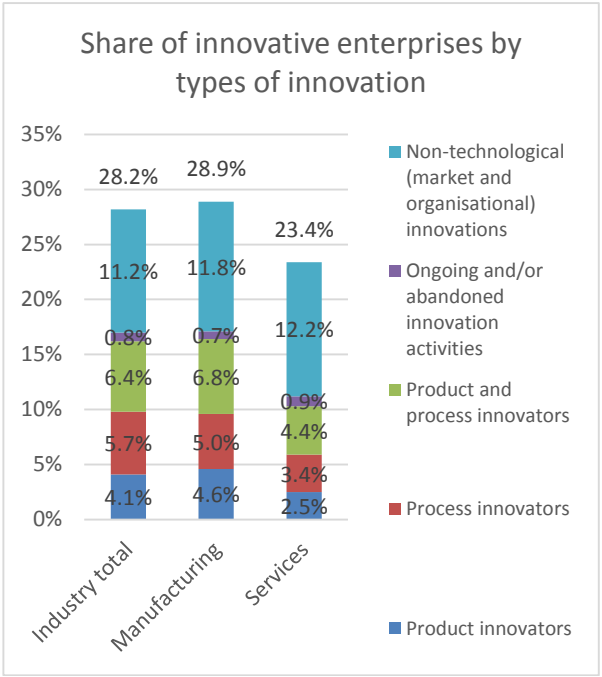


Figure 2. Share of innovative enterprises by sector and type of innovation as percentage of total enterprises in the sector.



Source: Central Statistical Bureau of the Republic of Latvia

According to Eurostat data, Latvia shows steady labour productivity growth[4] from 2000 to 2016 driven in part by high levels of foreign investment (mostly in the banking and real estate sectors). The wage growth is starting to outpace the increase in productivity, raising concerns about cost competitiveness of the Latvian economy in the medium term. To maintain the growth of productivity in the same pace the business model of Latvian enterprises should change towards more knowledge intensive products and services.

1.1 Structure of the economy

As reported by the Central Statistical Bureau, in the years 2013, 2014 and 2015, the share of small- and medium-sized enterprises (SMEs) in Latvia was exceptionally high – 99.8% in 2013, and 99.9% in 2014 and 2015. The share of micro enterprises, employing up to nine people, is also slowly growing and in 2015 amounted to 93.6% of all economically active enterprises in Latvia. The weight of SMEs across various sectors of the economy follows the same pattern with SMEs accounting for more than 99% in all sectors – agricultural sector, industry,[5] construction, wholesale and retail, and service sectors[6].

In 2014, Latvian SMEs generated around 69% of the non-financial business economy's value added (Central Statistical Bureau of Latvia, 2016). This is a significant proportion, as the European average at the time was around 58%. The Latvian SMEs are, to a large extent, concentrated in sectors with low and medium-low research intensity, such as metal processing and machinery, wood products and food processing.

Eurostat data indicates that the service sector accounted for 74.7% of Latvia's total value added in 2016, with its share steadily increasing since 2010. Two other sectors, namely, the industrial and the agricultural sectors, accounted for 16.7% and 3.2% of value added in 2016, respectively. The construction industry contributed 5.2% of the total gross value

[4] Labour productivity per person employed in Latvia increased to 64.3% of the EU-28 average in 2015 compared to 52% in 2000.
[5] Industry sectors correspond to NACE codes B-E
[6] Service sectors correspond to NACE codes H-N

added in 2016, whereas the manufacturing industry (part of the industrial sector) amounted to 12.3% (Eurostat, 2017).

A similar weight distribution across sectors is observed when looking at employment statistics with services accounting for 69% of total employment and manufacturing – 13.8% in 2016 (ESTAT data 2017).

In 2015, medium-high and high technology manufacturing still accounted for only 20.2% of manufacturing industry's value added at factor costs (Central Statistical Bureau of the Republic of Latvia, 2017). However, the value added in these industries has been steadily growing over the period of 2010 to 2015 (average annual growth rate of 8.5%). The share of employees in high and medium-high technology manufacturing sectors in full time equivalent (FTE) grew from 12.7% in 2010 to 14.7% in 2015.

1.2 Business environment

Overviewing the assessments of Latvia's performance presented in various reports and indexes (see below), the notable strengths of Latvia's business environment are the ease of starting a business, the ease of getting credit, paying taxes, and few enterprise internationalisation aspects. The main weaknesses are resolving insolvency, issues related to supply of human resources, government procurement of advanced technological products, and various aspects related to enterprise innovativeness.

The World Bank Doing Business (DB) 2017 rankings, the Global Innovation Index (GII) 2017 and the World Economic Forum Global Competitiveness Index (GCI) 2016-2017 all mention the **ease of starting a business** and assign it a relatively good assessment for Latvia. Latvia ranks 22nd out of 190 economies with regards to this aspect in DB 2017 with as much as 94.15 percentage points in Distance to Frontier (DTF)[7]. The good ranking is associated with comparatively small number of procedures, little time and costs associated with starting a business in Latvia when compared to the average of Europe and Central Asia as well as OECD high income countries. In the GII 2017, Latvia ranks 20th out of 127 economies when it comes to starting a business,[8] whereas GCI 2016-2017 places Latvia in the 22nd place with regards to the number of procedures to start a business and 28th place with regards to time required to start a business (out of 138 economies). On a related note, the EC Small Business Act (SBA) Factsheet 2016 emphasises the high level of entrepreneurial intentions and early stage entrepreneurship observable in Latvia, and the GII ranks Latvia 10th when it comes to number of new businesses per thousand of population.

Another strength of the Latvian business environment would be the **ease of getting credit** – this strength is acknowledged in DB rankings and GII 2017.[9] Latvia's position in the World Bank ranking improved by 11 places - from 18th in DB 2015 to 7th in DB 2017. The high ranking is attributable to above average indexes of legal rights and credit information depth as well as broad coverage of credit registry and credit bureau. According to DB overview, in 2017, access to credit information was improved in Latvia by launching a private credit bureau. However, when it comes to access to other types of financing, availability of venture capital (VC) is a prominent problem. This weakness is

[7] The DTF score aids in assessing the absolute level of regulatory performance and how it improves over time. This measure shows the distance of the economy to the "frontier", which represents the best performance observed on each of the indicators across all economies in the *Doing Business* sample since 2005. An economy's distance to frontier is reflected on a scale from 0 to 100, where 0 represents the lowest performance and 100 represents the frontier. For example, a score of 75 in DB 2016 means an economy was 25 percentage points away from the frontier constructed from the best performances across all economies and across time. A score of 80 in DB 2017 would indicate the economy is improving. Measured in % points.

[8] GII 2017 ranking with regards to ease of starting a business is based on World Bank's Ease of Doing Business Index.

[9] GII 2017 ranking with regards to ease of getting credit is based on World Bank's Ease of Doing Business Index and assigns Latvia the same ranking (7th place).

also acknowledged in the GCI assessment, where an index value of only 2.5 out of 7 is assigned to the Latvian VC landscape.

The DB indicators in 2017 and the GII rank that is based on it, point to the ease of paying taxes as another comparative strength of Latvia. Up by one place since 2016, Latvia ranks 15th in DB 2017, and 14th in the GII ranking. The advancement in DB performance was caused by improvements in the country's online systems for filing corporate income tax return and mandatory labour contributions.

In DB 2017 rankings, Latvia was the 44th most favourable economy for **resolving insolvency**, with this ranking being Latvia's lowest out of the 10 aspects evaluated in the World Bank's assessment. Most Latvian indicators under this aspect are close to the OECD average. A notable exception is the rate of recovery – while in the OECD member states the creditors could recover on average around 73% of their investment from the insolvent firm at the end of insolvency proceedings, in Latvia this number was 49.1%. Given the DB assessment and the issues with abuse of insolvency procedures in Latvia, it could be viewed as one of the weaknesses cumbering the Latvian business environment.

An issue topical to both the science community and the businesses in Latvia is the **lack of human resources** with the right set of knowledge and skills. The overviewed innovation, competitiveness and entrepreneurship reports also point to this issue in the context of the Latvian business landscape – GII 2017 indicates the number of graduates in science and engineering as well as research talent in business as notable weaknesses of the Latvian economy. GCI points to the country's capacity to retain and attract talent (rank – 118th out of 138) as well as availability of scientists and engineers (rank - 99th). The Digital Economy and Society Index (DESI) 2017 results also indicate that the development of the Human Capital dimension in Latvia is still below the EU average with regards to all four included components – internet users, at least basic digital skills, ICT specialists and STEM graduates. The latter two are especially relevant for successful development of an innovative business sector. Further endorsing the lack of adequately trained human resources in Latvia, the EC SBA Factsheet discusses the comparatively low percentage of SMEs that provide training to their employees.

Another weakness characterising the Latvian business sector is the unresolved issues hindering the innovativeness of enterprises – low GERD financed by business (GII), weak state of cluster development (GII), low proportion of businesses integrating digital technologies (DESI), and low percentage of innovative SMEs and SMEs selling their products or services online (SBA).

As regards **access to finance**, in 2017 the Development Finance Institution Altum has started a number of new initiatives aiming to facilitate financial support for entrepreneurship. One example is the implementation of the Acceleration Fund measure aiming to support innovative start-ups with high growth potential at an early stage of development. Within the framework of this programme (planned investment within the measure: €15m), Altum was the first in the Baltics to choose fund managers in an international contest. The other risk capital support schemes (seed and growth fund programs) are still at the organisational stage with selection of financial intermediaries for the programme planned until the end of November 2017.

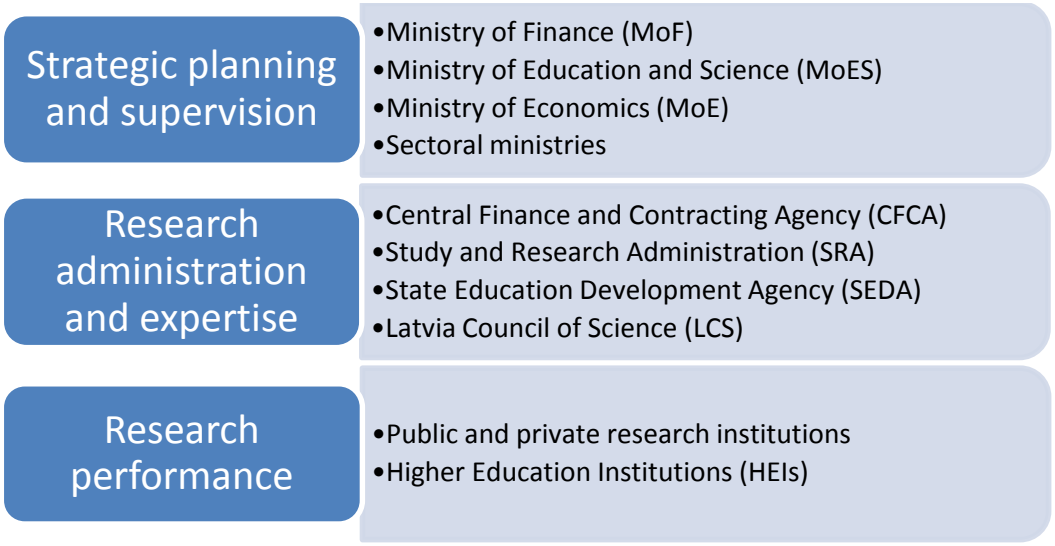
In the first half of 2017, the "Start programme" financing increased significantly – almost €40m were distributed for projects related to starting a business (Altum, 2017).[10] In total, during the first half of 2017, more than €60m were distributed by Altum within the state support programmes, corresponding to a 3% increase when compared to the same period in the previous year.

[10] https://www.altum.lv/lv/jaunumi/si-gada-pirmaja-pusgada-altum-valsts-atbalsta-programmas-pieskirusi-61-miljonu-eiro

2 Main R&I actors

The main R&D system actors and their competences are summarised in Figure 3.

Figure 3. Basic structure of R&D system actors and main competences.



Source: MoES presentation "Research Funding System in Latvia: Request for Specific Support", 2017.

The Parliament of Latvia and the Cabinet of Ministers of the Republic of Latvia set the state's policy on the development of science and technology in broad terms.

The **Ministry of Education and Science (MoES)** has a pivotal role to play in developing R&I policy. MoES designs and coordinates public policies when it comes to research and education and supports project financing instruments and the Smart Specialisation Strategy (RIS3). Its subordinate institution, the **State Education Development Agency (SEDA)**, often implements the programmes designed by the MoES. The role of SEDA in the governance of EU funds for R&D is expected to decrease in the period 2014-2020 due to the planned consolidation of the system. However, this agency will still play an essential role in policy planning.

The **Ministry of Economics (MoE)** is responsible for developing policies related to business support and innovation as well as the design, introduction and supervision of Structural Funds programmes and projects pertaining to enterprise support and innovation. In the previous EU programming period (2007-2013), the **Latvian Investment and Development Agency (LIDA)**, which is one of the institutions overseen by the MoE, implemented these policies and programmes. The involvement of the Ministry of Economics in R&I activities is relatively low when compared to the involvement of the Ministry of Education and Science.

In March of 2016 the Innovation Department was established within the Ministry of Economics to ensure enhanced synergy between the policy planning functions and the EU support instruments as well as to assure more effective implementation of the state administration functions. In 2016, the Ministry of Economics started to develop sectoral development strategies towards more knowledge intensive products and higher labour productivity. While there is still little visible progress, the focus of the current policies is placed on productivity.

The **Central Finance and Contracting Agency (CFCA)** has had a more influential role with respect to the governance of R&D funds since the start of the new EU programming period of 2014-2020. CFCA had to replace some of the functions of two main government funding agencies – SEDA and LIDA. CFCA is a state agency that is subordinate to the Ministry of Finance. With the aim of improving funding absorption, minimising costs and

bureaucracy, the Ministry of Finance initiated concentration of EU fund allocation and oversight in the hands of one institution.

The JSC **Development Finance Institution Altum** is a financing institution that is fully owned by the state and has three ministries as its shareholders. The new unified institution was created in April 2015 when the Latvian Guarantee Agency (LGA) merged with the State Joint Stock Company Latvian Development Financial Institution Altum (ALTUM) and the State Joint Stock Company Rural Development Fund (RDF). The objective of Altum is to use state support financial instruments in order to provide efficient and professional support to growing businesses in the form of financial instruments.

The **Study and Research Administration (SRA)** is another institution responsible for the implementation of R&I policy under the Law on Research Activity. Subordinate to the Minister of Education and Science, the ASR is, among other things, tasked to supervise the use of financial resources in research and administer the state budget resources allocated to fundamental and applied research projects.

On the advisory level, two institutions exist: The **Council of Higher Education (HEC)** of Latvia helps to develop the national strategy on higher education, to encourage cooperation between HEIs, state institutions and the general public, and to oversee the quality of higher education. The **Research and Innovation Council (RIC)** is a relatively new advisory body that was established at the end of 2013. and its task is to advise the Cabinet of Ministers on important matters concerning research and technology investments and the evaluation of policy proposals.

The number of organizations (as independent legal entities) engaged in R&D in the government sector remained relatively stable over the years since 2010 and decreased by 3 institutions to 16 in 2016 (Central Statistical Bureau of the Republic of Latvia, 2017).[11]

Three Latvian universities, namely the University of Latvia, Riga Technical University and Riga Stradins University, are internationally recognised for their research institutes and scientific groups. The research activities of smaller and private HEIs, on the other hand, are not well developed. The main research performers at the universities are research institutes with various degrees of autonomy and legal statuses.

Latvia has 8 Technology transfer contact points[12] and 4 Science and Technology Parks[13] aiming to facilitate links between research in higher education institutions and the private sector, and support and promote knowledge and technology transfer.

As of 2017, more emphasis is put on aligning HES development with real industry needs by introducing a requirement to coordinate HEI and scientific institution development strategies, research programmes and STEM study programmes with industry associations. Moreover, some of the research programmes, such as "Practical and post-doctoral research programme", also facilitate coordination with the industry – programme applications were required to be complemented with a review from businesses or industry associations, thereby ensuring research compliance with industry development needs and the circulation of information between research organisations and industry.

[11] Latvia has a register of scientific organizations, where entities engaging in scientific activities are registered. According to the Law on Scientific Activities (https://likumi.lv/doc.php?id=107337) the Register of Scientific Institutions registers independent legal entities. The number of scientific institutions has historically significantly exceeded the number of independent legal entities engaging in scientific activity. Therefore, there is an important distinction between a decrease in the number of scientific institutions, (e.g. as a result of a consolidation of several structural units of the same organization) and a decrease in the real number of legal entities.

[12] Full list here: http://www.liaa.gov.lv/lv/tehnologiju-parneses-kontaktpunkti

[13] http://www.spica-directory.net/associations/?id=40

3 R&I policies, funding trends and human resources

Main R&I policy developments in 2017

Document title, hyperlink and date of publication/announcement	*Short description*
The Law on Support of Start-up Activity,[14] in force since 01.01.2017	As of 1st of January 2017, the Innovative Start-up Law entered into force aiming to create a tax regime that will stimulate the growth of innovative Latvian start-ups. This law sets two tax regimes for innovative start-ups: a flat tax regime (€252 per month per employee regardless of their salary) ensuring minimal social benefits, and a tax plan where all the social and personal taxes of highly qualified employees are covered by the state and the employees receive full social benefits.
Amendments to the Microenterprise Tax Law, [15] entered into force on 01.01.2017	As of 1st of January, 2017, the microenterprise tax rate was amended to 12% if the company's turnover is up to €7,000 and 15% if the turnover is between €7,000 and €100,000.
Tax reform package,[16] approved by the Parliament of Latvia on 28.07.2017	The Parliament of the Republic of Latvia approved the tax reform package consisting of 11 regulatory reform proposals. According to the Ministry of Finance, the goals of the tax reform include: • Average annual GDP growth of at least 5% as set in the National Development Plan (NDP); • Reduction of income inequality for employees; • Bringing the total amount of tax revenues in 2018 closer to 30% of GDP; • Increased efficiency of the State Revenue Service; • Reduction of the shadow economy size. The main proposals included in the reform package are the following: • increase the minimum wage from €380 in 2017 to €430 in 2018; • introduce a progressive personal income tax (PIT) rate; • increase the PIT rate for income on capital and capital gains; • increase the differential non-taxable minimum; • increase the social contribution tax rate for both employers and employees by 0.5% from 2018; • introduce amendments to the corporate income tax by applying no taxes to reinvested profits, and raising the tax from 15% to 20% for dividends and expenses not related to business activities;

[14] https://likumi.lv/ta/id/287272-jaunuznemumu-darbibas-atbalsta-likums
[15] https://likumi.lv/ta/id/287775-grozijumi-mikrouznemumu-nodokla-likuma
[16] http://www.mk.gov.lv/lv/aktualitates/saeima-apstiprina-nodoklu-reformas-likumu-paketi ; http://www.fm.gov.lv/lv/nodoklu_reforma/ ; http://saeima.lv/lv/par-saeimu/informativie-materiali-par-saeimu/infografika-nodoklu-reforma-2018/

	• decrease the maximum yearly turnover to classify as a micro enterprise to 40,000 euros; • change the patent cost structure; • improve information disclosure with regards to aspects that will help combat the shadow economy as well as introduce few other shadow economy combating mechanisms; • improve the reporting and registering of construction industry data to address the risks of grey economy; • reduce the VAT registration threshold; • raise excise duties on tobacco products, alcoholic beverages and mineral oils; • raise and expand the scope of the gambling tax. It is planned to implement the reforms in 2018.
CoM approved the conditions for the implementation of a new national support measure "Portfolio guarantees" (Portfeļgarantijas),[17] 05.09.2017.	On 5th of September 2017, the Cabinet of Ministers approved the implementation of a new national support measure for microenterprises and SMEs "Portfolio Guarantees" that will be administered by Altum. The total budget of the planned measure is €8m. The programme is expected to improve access to finance for SMEs, support creation of new enterprises and expansion of existing ones. It is planned that businesses will be able to receive the first portfolio guarantees already in the first quarter of 2018.

R&I funding trends

The National Reform Programme and the National Development Plan of Latvia have set the national target for GERD at 1.5% of GDP for the year 2020. The country is currently not on track to achieve this target.

Gross Expenditure on R&D in 2016 in Latvia decreased quite significantly both in absolute terms and relative to GDP. According to the Central Statistical Bureau of Latvia and Eurostat data, the total expenditure decreased from €152.2m in 2015 to €110.4m in 2016, which corresponds to 0.63% and 0.44% of GDP, accordingly. In absolute terms, this is the lowest GERD since 2010.

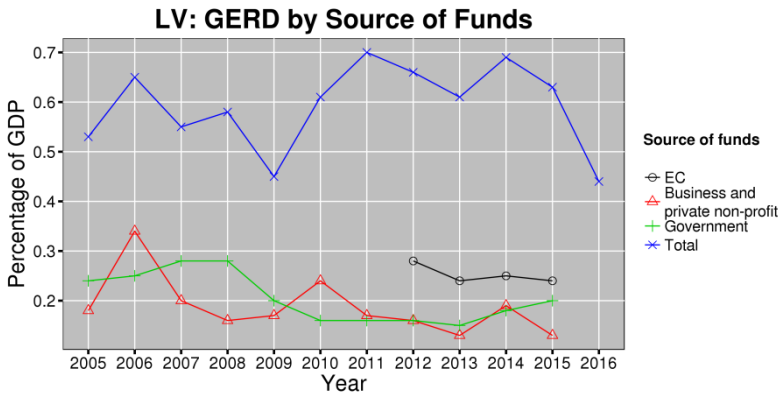
The biggest part of GERD in 2016 was financed by the government sector – €52.7m (47.7% of total). This figure reveals an increase in government funded R&D of almost 6% compared to 2015 and is the biggest nominal value and share in the period of 2010 - 2016.

The biggest decrease of R&D funding in 2016 was seen in the foreign funds – the source of funding that has accounted for around 50% of total GERD every year since 2011, declined to 27.8% in 2016 and amounted to €30.7m. This trend can be explained by the downturn in the EU funding cycle.

The shares of GERD financed by the business enterprise and higher education sectors remained at similar levels as in 2015, both slightly increasing to 21.6% and 2.9%, respectively.

[17] https://www.altum.lv/lv/jaunumi/uznemumiem-bus-pieejama-jauns-finansu-atbalsta-instruments-portfelgarantijas

Figure 4. GERD by source of funds

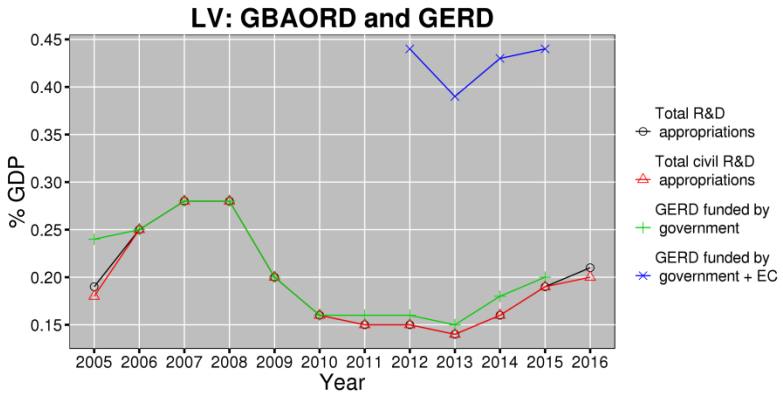


Source: ESTAT data 2017

3.1 Public allocation of R&D and R&D expenditure

The Latvian government budget appropriations or outlays for R&D (GBAORD) increased from nearly €29m in 2010 to about €52.6m (0.21% of GDP) in 2016 (**Error! Reference ource not found.**). However, the EU average GBAORD as % of GDP is 3 times higher than the one in Latvia. The government's support to R&D in the country is therefore still very modest.

Figure 5. Public allocation of R&D and R&D expenditure



Source: ESTAT data 2017

Publicly funded R&D is almost entirely performed by the public sector. According to data from the CSB of Latvia, in 2016, 39.3% of government funded R&D was performed by the governmental sector, 59.4% by the higher education sector and only 1.3% by the business enterprise sector. Government funding contributed to only 2.6% of total business expenditure on R&D.

With the exception of 2014, in the recent years, R&D performed by the governmental sector has shown increasing volumes, accounting for 25.6% of the total GERD in 2015 and further increasing to 31.8% in 2016. The share of R&D performed by the higher education sector (HES) is still the most significant contributor to the R&D activity in Latvia, spending almost a half of the total R&D funds (43.8% in 2016). The share of R&D performed by the HES has fluctuated since 2010, with a decrease of almost 6% in 2016. There were 63 institutions engaged in R&D within the HES in 2016, including R&D institutions under the supervision of higher education institutions, and they employed over 61% of total R&D personnel in terms of FTE (Central Statistical Bureau of the Republic of Latvia, 2017).

As regards indirect funding, a tax incentive (enhanced allowance scheme) was introduced in July 2014. The scheme offers a 300% super deduction of a range of R&D expenditures

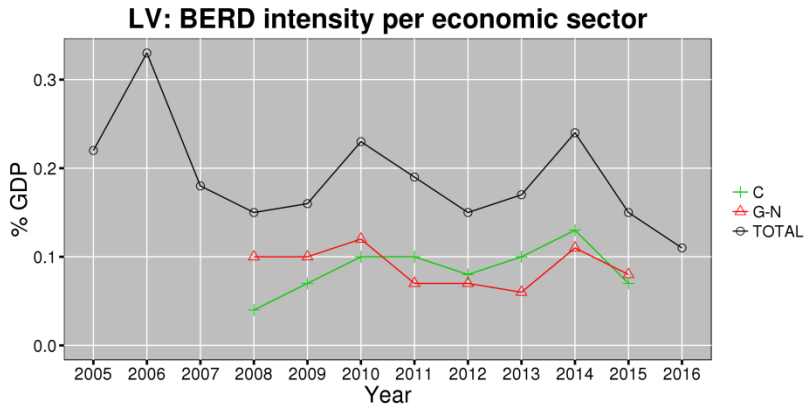
but the take-up has been low. In the context of the recent tax system reform, the current R&D tax incentive will be replaced by the zero corporate income tax on re-invested profits.

3.2 Private R&D expenditure

BERD intensity in Latvia has been stagnating during the recent years and is one of the lowest in the EU. It peaked in 2006 but then went back down to values of around and below 0.2% of GDP. In 2016, it decreased by around 28% and amounted to €27m or 0.11% of GDP. The share of R&D performed by the private sector decreased from 35.5% in 2014 to 24.7% and 24.5% in 2015 and 2016, respectively. In 2016, the business sector also employed the smallest share of R&D personnel – 17.5% or 896 people in FTE. The number of personnel employed in the BES (in FTE) has been decreasing quite rapidly since 2014 – by 17% in 2015 and 21.7% in 2016.

Following the prevalent trend in the period of 2010-2016, the biggest share of business expenditure on R&D in 2016 was funded within the sector (65.6% of total BERD). The only exceptional year within the mentioned period was 2015, when the biggest proportion of BERD was financed by foreign funds. The remaining two sources of funding – governmental sector and foreign funds - accounted for 2.6% and 31.9% of the expenditure in 2016, accordingly.

Figure 6. BERD intensity per economic sector



Source: ESTAT data 2017

The highest BERD spenders have been the manufacturing and business services sectors (Figure 6). In 2011 business services R&D intensity dropped and manufacturing became the most important sector in this respect. In the manufacturing top sectors (in terms of BERD the pharmaceutical industry, the manufacture of computer, electronic and optical products and the manufacture of wood products are responsible for the increase in manufacturing BERD since 2011. Thanks to long-standing traditions, Latvia has a strong manufacturing base in fine chemicals and pharmaceuticals. The country was the principal location for these sectors in the former Soviet Union, with 25% of new Soviet-era drug technology designed there. In the wood sector mostly plywood for different commercial transport and housing applications is produced.

In the business services sector professional, scientific and technical activities, ICT, as well as the financial and insurance activities sector are the top BERD spenders. The Latvian ICT sector is less developed than in the neighbouring Baltic countries and for a while its R&D spending was quite small but since 2013 an increase is observable and the sector is developing fast, especially in the field of gaming services.

Overviewing the R&D intensity in the business sector by enterprise size, it can be seen that SMEs, being the prevalent category in the Latvian economy, overall account for the majority of R&D spending, namely 71.1% of total BERD (2014).

3.3 Supply of R&I human resources

Eurostat data illustrates the issue of decreasing number of graduates in Science Technology, Engineering and Mathematics (STEM) fields in Latvia. While the EU experienced a moderate increase in STEM graduates per thousand of population aged 20-29 in the period 2013-2015, in Latvia this number was slowly decreasing. In 2015, there were 19.1 STEM graduates per thousand of population in the EU in tertiary levels of education, with females accounting for almost 69% of this number. In Latvia, STEM graduate numbers decreased from 14.1 in 2013 to 13.1 in 2014 and 12.9 in 2015 per thousand of population.

The number of doctorates per thousand of population aged 20-29 in STEM fields was 1 in the EU and 0.4 in Latvia in 2015. The total number of new doctoral graduates per 1000 population aged 25-34 (0.47 in 2015) is also about twice lower than the EU average.

The low number of graduates in STEM contributes to the acute problem of highly qualified human resource shortage in the Latvian R&D&I system. Around 70% of employers regularly face lack of qualified workforce, according to the Latvian Employers' Confederation. Main factors contributing to the human resource problems in Latvia are the lack of mechanisms to attract or maintain industry scientists, heavy workload of scientists which potentially harms the quality of the research conducted and an ageing scientist base. The lack of researchers in science and industry is also caused by non-competitive remuneration.

Furthermore, the availability of highly-skilled human resource in Latvia is affected by the negative net migration flows, including the effects of brain drain and emigration of young people (Central Statistical Bureau of the Republic of Latvia, 2017).

In 2010, the percentage of women in R&D academic staff was 32.1% in Latvia compared to the EU average of 19.8%. In 2015, the share of women researchers in Latvia was 51.02%. In practice, the proportion of women working in science in Latvia is among the highest in the European Union.

The Latvian European Research Area roadmap 2016-2020, approved by the Cabinet of Ministers in September 2016, sets out to "continue to ensure equal opportunities for both genders in organisational structures and decision-making processes in the fields of higher education and science, and to raise the prestige of the scientist's profession in Latvia" as a national direction of action.

Latvia does not have specific policies, strategies or financial measures for gender equality in science, however, the existing regulatory framework creates no legal barrier to obtaining some specific rights. Statistically, when comparing to the average EU level, Latvia is one of the leaders in gender equality figures.

However, women in the Latvian science generally occupy lower positions and are less often participating in decision-making processes. Hence, there are considerations of adding the gender equality principle to the Law on Research Activity and the Law On Institutions of Higher Education.

When looking at statistics of graduates in tertiary education in STEM fields, the proportion of females in the Latvian education system is very close to that of the EU.

4 Policies to address innovation challenges

4.1 Challenge 1: Insufficient supply of human capital for innovation

Description[18]

In the context of the RD&I system insufficient supply of human resources is one of the biggest issues for Latvia. This is true for both the business and the public sector, and human capital capacity in both cases relates not only to the number of people[19], but also to the relevance of their knowledge.

The issue is further amplified by insufficient quality of education in natural sciences in high schools, aging researcher population, net migration tendencies and non-competitive remuneration in science (see section 3.3).

Policy response

The main public policy initiatives tackling the lack of human resources for science and innovation are the following:

- Reformed procedures of higher education financing (i.e. introducing performance-related components), and study programme licensing and accreditation (to foster quality evaluation of the professional study courses and programs);
- Mandatory state exams in natural sciences;
- The Innovative Start-up initiative.[20]

In 2017, the Ministry of Education and Science initiated more active coordination of HEI strategies and infrastructure investments with industry representative in order to ensure that the development of higher education and science is in line with industry needs. MoES developed a set of criteria for evaluating the development strategies of universities, colleges and scientific institutions, which included a requirement to coordinate research programmes, STEM study programmes and the development strategy itself with associations of related industries.

In 2017 increasing productivity was emphasised as one of the main policy goals by MoE.[21] Increase in productivity can address the population decline and labour force shortage overall. However, the labour shortage is sectoral, meaning that the focus on productivity cannot address this issue universally in the short term. Moreover, it cannot solve the lack of highly-qualified human resources in R&D&I.

Assessment

The coordination of higher education institutions' development plans and study programmes with the industry representatives is an important step towards addressing not only the shortage of qualified human resources but also towards increasing intersectoral cooperation. According to MoES, this process requires repeated coordination

[18] For a more detailed description of the challenge refer to RIO Country Report 2016: Latvia

[19] The number of new doctoral graduates per thousand population aged 25-34 in Latvia is among the lowest in the EU: 0.5 in 2013, EU28 average: 1.07. Same is true for the number of researchers per thousand population (3.68 in Latvia vs. 5.36 in EU28).

[20] The Innovative Start-up Initiative contributes to development of human capital and facilitates attraction of highly qualified human resources to innovative young companies by setting up two tax regimes for the innovative start-ups: a flat tax regime - €252 per month per employee ensuring the minimal social benefits, and a tax plan where all the social and personal taxes of highly qualified employees are covered by the state and the employees receive full social benefits.

[21] http://esmaja.lv/sites/default/files/a_aseradens_produktivitate_latvija_-_tendences_izaicinajumi_politika_20170602.pdf

between the scientific institutions and the associations as well as some cultural changes within the involved stakeholders.

As regards future measures in the pipeline, it is planned that one of the main priorities of MoES in 2018 will be a reform of the primary and secondary school network and consolidation of schools, putting emphasis on education quality, especially in STEM fields.

4.2 Challenge 2: Fragmented public research and education system and low quality of the science base

Description[22]

One of the main structural challenges that Latvia is facing and has received multiple CSRs about is the high level of fragmentation in the higher education and research systems, both in terms of the high number of institutions as well as their geographical dispersion.

The excessive number of institutions leads to inefficient use of financial and administrative resources and causes problems for knowledge management. Inadequate public funding in a fragmented research and innovation system[23] is also naturally leading to a lack of scientific excellence.

Policy response

The most notable policy response to this challenge up to 2017 has been the consolidation process of the Latvian R&D system through base financing allocation[24].

In 2017, the consolidation process was continued by closing one of the higher education institutions – Riga Teacher Training and Educational Management Academy (RPIVA) became part of University of Latvia.

Assessment

Up until 2017, the consolidation of scientific and higher education institutions has been mostly administrative – none of the institutions were actually closed or relocated. Such approach is an important first step as it decreases the share of administrative costs and to some degree consolidates human resources. While administrative consolidation is necessary, it ought to be followed by geographical relocation and more active physical consolidation of institutions that have a small number of researchers and overlap in research fields. For example, at least 10 research institutions receiving public base financing still have less than 50 researchers in terms of FTE.

The developments in 2017 could be viewed as the first example of the next step of the consolidation. However, the move was strongly opposed by RPIVA management and partly by the administrations of other smaller HEIs. It is expected that in the near future the government will hold off any further physical consolidation in terms of closing down institutions due to the strong opposition. This raises concerns about effectively addressing the fragmentation of research and education systems as, despite the efforts of consolidation, fragmentation in the educational system so far did not change significantly.

4.3 Challenge 3: Lack of demand-side policy measures for the creation and stimulation of markets

Description[25]

[22] For a more detailed description of the challenge refer to RIO Country Report 2016: Latvia
[23] Fragmentation makes an increase in public financing less effective.
[24] For a more detailed description of the process refer to RIO Country Report 2016: Latvia

Demand-side innovation promotion instruments such as public procurement for innovation and pre-commercial procurement are largely absent in Latvia, which significantly influences innovation performance of both the public and the private sector. The main support measures providing incentives for businesses to invest in R&D are direct support schemes and a tax incentive.

Policy response

The main development in the recent years in this area is the amendment to the Law of Public Procurement making it easier to involve external evaluation experts and decreasing the level of bureaucratic costs of R&I performers.

In 2017, a related development was the approval of the tax reform package proposed by the Ministry of Finance (see section 3). One of the approved reforms will amend the corporate income taxation stimulating businesses to reinvest their profits into business development by foregoing the tax on reinvested profits.

As of January, 2017, Latvia is one of the participating countries in EC's Mutual Learning Exercise (MLE) on Innovation Procurement under the Policy Support Facility (PSF), the purpose of which is to set up an EU knowledge-sharing service on innovation-enhancing procurement, learning from good practices and providing support in designing, implementing and/or evaluating different policy instruments in relation to innovation-enhancing procurement (European Commission, 2017).[26]

Assessment

The planned corporate income tax (CIT) reform might be even less effective than the existing R&D tax incentive and will have an unclear effect on R&D expenditure. While the CIT reform promotes investment into business development, including R&D investments, it is unclear whether investment focus will be shifted towards other type of investments instead of towards R&D.

The incentive to reinvest in R&D might be diminished because, while the businesses will be motivated to reinvest profits into development of the firm under the new CIT framework, there will be less incentive to invest in R&D over development of production capacity or other business aspects (as both would not be taxed). Moreover, little incentive would be left to carefully consider which investments classify as R&D investments and which do not, which can lead to issues with R&D reporting.

With regard to public procurement, positive changes can be observed in 2017 with increasing the number of procurements involving external experts for evaluation of proposals and projects, indicating that the public procurement is advancing in a positive direction.

However, the lack of smart procurement and procurement of innovation is still a problem when it comes to the Latvian government approach to creating and stimulating markets. A drawback for public procurement is still the law emphasising price as the main criteria for selection.

4.4 Challenge 4: Limited effectiveness and efficiency of the RD&I funding system

Description

There is a combination of factors that is limiting the possibility of further effectiveness and efficiency improvements of public RD&I funding - namely, insufficient funding, lack of

[25] For a more detailed description refer to RIO Country Report 2016: Latvia, Section 6
[26] https://rio.jrc.ec.europa.eu/en/policy-support-facility/mle-innovation-procurement

trust between stakeholders (agencies, scientists and universities), low risk tolerance of the agencies managing EU funding schemes and the practice of attributing policy goals to individual projects proportional to the project's share of funding. Instead of setting an aggregate goal for all projects within a programme, the expected goals are set for each project individually. This often limits project participant ambition – even if the project could deliver more and better results, the performers limit themselves to the attributed minimum to avoid the risk of failing to deliver the promised results and not receiving funding.

Moreover, the programme rules describe not only the expected result of the project, but also excessively frame the process - methods, approaches and activities. This affects the quality of competition between projects emphasising formal metrics over expert evaluation. For example, project selection criteria of EU funding activity 1.2.1.4. "Support for introduction of new products into production" are based on a combination of 12 quantifiable evaluation criteria. Another example is the requirement for R&D performers to register hours per each work package separately, by types of tasks, on a daily basis. Researchers usually do not distinguish their daily activities between reviewing existing publications and writing analysis.

Ultimately, this approach leads to several disadvantages:

- It limits R&D performers' degree of freedom and flexibility in choosing methods, approaches and adapting to changing circumstances while performing R&D projects;
- Decreases efficiency of project evaluation by limiting the role of the experts;
- Diverts limited researcher resources towards bureaucratic activities.

Policy response

While Latvia is still developing social capital in building trust in institutions, there is significant progress and some important policy modifications can be observed.

For example, the EU-funded postdoctoral research support programme, designed by the Ministry of Education and Science, contains only three qualitative evaluation criteria.

To bring another example, the Programme for support of applied research introduced an evaluation process by experts from the European Commission database of experts. This can be considered as an important step towards relying on more flexible expert assessment rather than formal quantitative requirements that in some cases may be demotivating the project performers and limiting their ambition.

Moreover, the design of the programme "Competence Centres" introduced a completely new approach by delegating part of project selection and evaluation to the competence centres themselves, which by design are managed by industry leaders. In the scope of the programme "Competence Centres" the industry, as a group of enterprises, is responsible for delivering innovation results in the form of new products, new technologies and improved productivity. It is given the competence to evaluate and select projects by selected group of experts. The competence centres are also delegated with making decisions on stopping or continuing research and innovation projects inside the centre.

Finally, the managing authorities have a new approach to risk management by requesting only a fraction of the documents for review.

Assessment

Some of the newly introduced policies are a step forward towards building mutual trust between R&D performers and authorities. For example, the introduction of the new approach to project selection by employing international expert evaluators is a huge step forward.

The approach used in the programme "Competence Centres" should also be considered a big step forward in mutual trust building. The design of the programme is especially useful for innovation projects where an individual project can be stopped immediately when it becomes unfeasible to continue due to commercial or technical reasons. This approach corresponds to the very nature of R&D activities. At the same time, the managing authority can rest assured that, statistically, "Competence Centres" as a programme will deliver the expected innovation results, because many projects will succeed.

Managing authorities requesting only a part of original documents for risk assessment is also an indication of increasing trust between R&I stakeholders.

5 Focus on R&I in National and Regional Smart Specialisation Strategies

Progress on implementation

The Smart Specialisation Strategy in Latvia is implemented through targeted design of support measures and respective allocation of funding. RIS3 is facilitated through both state budget programmes and EU funding programmes.

The EU Structural Funds Programme for Research and Innovation for the period of 2014-2020 that is directly targeted at promotion of RIS3 fields is Programme 1.1.1.4. Support for the development of R&I in smart specialisation areas and capacity building of research institutions (including HEIs) – total financing of €115.3m, including SF financing of €98m. The programme is currently in preparation stage.

Many other state budget and ESIF financed programmes, aimed at RIS3 facilitation, contribute to achieving RIS3 micro level indicators. Some programmes, for instance "Practical and post-doctoral research programme", evaluate the potential project contribution to achievement of RIS3 goals and strengthening of RIS3 specialisation fields during project selection procedures.

However, given that many of the programmes were started only in late 2016 and 2017, it is not yet possible to reliably assess their effectiveness with regard to facilitating RIS3 indicator development. Nevertheless, some of the programmes present initial signals that the planned outcome indicators (see below) might not be achieved indicating a need for a revision of incentives created by the programmes.

Latvian institutions could take more active role in transnational cooperation initiatives on smart specialisation. There are no Latvian partners among the regions and countries participating in the partnerships of three S3 Thematic Platforms on Energy, Agro-Food, and Industrial Modernisation. Participation in the EU Territorial Cooperation Programmes is also modest.

Monitoring mechanisms

The RIS3 monitoring is mainly delegated to the Ministry of Education and Science and the Ministry of Economics.

According to the "Smart Specialisation Strategy Monitoring System"[27] report, the RIS3 monitoring system in Latvia revolves around three monitoring levels: the overall goals of the specialisation strategy, macro- and micro-level indicators. It was designed in such a way so that it would be more likely to, at least partly, capture the broad scope of the potential impact of public investment in science, technology development and innovation. The overall goals include an increase in investment in R&D as a percentage of GDP, a better position on the EU European Innovation Scoreboard (EIS) and higher productivity in the manufacturing sector. The macroeconomic level indicators, among others, include private sector investments in R&D, proportion of innovative companies, the number of R&D personnel and graduates in R&D related fields. Micro-level indicators are the micro indicators contributing to the achievement of the macro-level indicators.

In February of 2017, the Cabinet of Ministers approved a decision not to dedicate a separate budget/ financing for RIS3 monitoring system (which was initially planned in 2015) arguing that the financing for the Smart Specialization monitoring system and related activities is included or is planned to be included in various EU Structural Funds support programmes.

At the same time, the EU fund implementation planning does not foresee funds for technical assistance to MoES for research programme implementation. Therefore, both

[27] Report by the Ministry of Education and Science of the Republic of Latvia; accessible at: http://tap.mk.gov.lv/lv/mk/tap/?pid=40334802&mode=mk&date=2014-10-21

RIS3 monitoring (without a separate budget) and coordination of research programme implementation and planning was under MoES responsibility, causing overlaps and resulted in excessive workload (due to shortage of human resources) and delays.

Evidence of impact

According to the "Smart Specialisation Strategy Monitoring System" report (2014), progress of RIS3 implementation could be indicated by improvements towards the overall goals - an increase in R&D intensity, Latvia's positioning in the EIS, and increased productivity in the processing industry.

However, overviewing the R&D expenditure trends, including business expenditure (see section 3), it is notable that the indicators are not progressing as foreseen in the strategy.

Nevertheless, in 2015, Latvia was named as one of the countries that experienced the highest growth in EIS indicator performance and was "promoted" to the Moderate Innovators group, however, it is not possible to say to what extent this achievement was attributable to the incentives aimed at RIS3 promotion (European Commission, 2017).

There are positive trends in the exports of high and medium-high technology sector products (% of total Latvian exports), the number of papers published in international databases, as well as proportion of population (aged 30-34 years) having higher education.[28] The latter two are two out of three indicators that were concluded to have improved in the informative report on Smart Specialisation monitoring, prepared in June 2017.[29] According to the report, the smaller number of state financed scientific institutions (due to consolidation process) is the third progress indicator that shows significant improvement as of 2017 and indicates progress with regards to smart specialisation strategy.

Most of the indicators related to RIS3 goals, however, showed either slight improvements and were assigned a "steady" status, or decreased. As the RIS3 monitoring report indicates, at the hearth of the problem is the fact that the government has not allocated the budget that was planned in the Science, Technology Development and Innovation Guidelines, hence the decrease in investment indicators.

[28] http://www.mk.gov.lv/sites/default/files/editor/izm_ris3monit_150617_lpisp.pdf
[29] http://tap.mk.gov.lv/lv/mk/tap/?pid=40427624

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Abbreviations

BERD	Business Expenditure on Research and Development
BES	Business Enterprise Sector
CC	Competence Centre
CFCA	Central Finance and Contracting Agency. Agency under the Ministry of Finance (Latvian - Centrālā finanšu un līgumu aģentūra [CFLA])
CIT	Corporate Income Tax
CoM	Cabinet of Ministers of the Republic of Latvia (Latvian – Ministru kabinets [MK])
CSB	Central Statistical Bureau of the Republic of Latvia (Latvian – Centrālā statistikas pārvalde [CSP])
DB	Doing Business – World Bank project that provides objective measures of business regulations and their enforcement across 190 economies
DESI	Digital Economy and Society Index
DTF	Distance To Frontier (see footnote in section 1.2)
EC	European Commission
EIS	European Innovation Scoreboard
ERA	European Research Area
ESIF	European Structural and Investment Funds
EU	European Union
FDI	Foreign Direct Investment
FPs	Framework Programmes for research and technology development; FP7 is referring to the 7th Framework Programme carried out in the period of 2007-2013
FTE	Full Time Equivalent
GBAORD	Government budget appropriations or outlays for R&D
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GERD	Gross Expenditure on Research and Development
GII	Global Innovation Index
H2020	Horizon 2020 – the 8th EU Framework Programme for the period 2014-2020
HEC	Higher Education Council
HEI	Higher Education Institution
HES	Higher Education Sector
ICT	Information and Communications Technology
IP	Intellectual Property
LCS	Latvian Council of Science
LIDA	Latvian Investment and Development Agency. Agency under the Ministry of Economics (Latvian - Latvijas Investīciju un Attīstības Aģentūra [LIAA])

MLE	Mutual Learning Exercise
MoE	Ministry of Economics (Latvian – Ekonomikas Ministrija [EM])
MoES	Ministry of Education and Science (Izglītības un Zinātnes Ministrija [IZM])
MoF	Ministry of Finance (Finanšu Ministrija [FM])
MS	Member States of the European Union
NCP	National Contact Point
NDP	National Development Plan of Latvia
NRP	National Reform Programme of Latvia
OP	Operational Programme
PIT	Personal Income Tax
PRO	Public Research Organisation
PSF	Policy Support Facility
RIC	Research and Innovation Council
RIS3	Research and Innovation Strategies for Smart Specialisation
R&D	Research and Development
R&I	Research and Innovation
R&D&I	Research, Development and Innovation
SBA	Small Business Act
SEDA	State Education Development Agency. Agency under the Ministry of Education and Science (Latvian - Valsts Izglītības Attīstības Aģentūra [VIAA])
SF	Structural Funds
SME	Small-Medium Enterprise
SRA	Study and Research Administration
STDI	Science, Technology Development and Innovation
STDIG	Guidelines for Science, Technology Development, and Innovation 2014-2020
STEM	Science, Technology, Engineering and Mathematics - curriculum based on the idea of educating students in the four disciplines in an interdisciplinary and applied approach.
TTO	Technology Transfer Office, alo referred to as Technology Transfer Centres
VAT	Value Added Tax
VC	Venture Capital
WB	World Bank

Factsheet

	2009	2010	2011	2012	2013	2014	2015	2016	2017
GDP per capita (euro per capita)	8800	8500	9800	10800	11400	11900	12300	12700	
Value added of services as share of the total value added (% of total)	72.91	72.18	72.46	72.56	73.1	73.79	73.59	74.73	
Value added of manufacturing as share of the total value added (%)	10.94	13.52	13.3	13.21	12.76	12.35	11.97	12.27	
Employment in manufacturing as share of total employment (%)	13.03	13.84	14.08	14.53	14.22	13.69	13.32	13.42	
Employment in services as share of total employment (%)	67.82	68.82	68.18	68.14	68.35	68.82	68.96	69.69	
Share of Foreign controlled enterprises in the total nb of enterprises (%)	5.15	5.1	5.23	5.56	6.68	7.05	7.01		
Labour productivity (Index, 2010=100)	96.3	100	103.9	107.5	108.2	111.1	114.9	117.6	
New doctorate graduates (ISCED 6) per 1000 population aged 25-34	0.28	0.2	0.43	0.49	0.5	0.46	0.47	0.38	
Summary Innovation Index (rank)	26	26	26	26	26	24	24	24	
Innovative enterprises as a share of total number of enterprises (CIS data) (%)				30.4		25.5			
Innovation output indicator (Rank, Intra-EU Comparison)			23	25	25	25			
Turnover from innovation as % of total turnover (Eurostat)		3.1		5					
Country position in Doing Business (Ease of doing business index WB)(1=most business-friendly regulations)						22	22	14	14
Ease of getting credit (WB GII) (Rank)						22	18	7	
EC Digital Economy & Society Index (DESI) (Rank)						19	19	19	19
E-Government Development Index Rank		37		42		31		45	
Online availability of public services – Percentage of individuals having interactions with public authorities via Internet (last 12 months)	30	40	41	47	35	54	52	69	69
GERD (as % of GDP)	0.45	0.61	0.7	0.66	0.61	0.69	0.63	0.44	
GBAORD (as % of GDP)	0.2	0.16	0.15	0.15	0.14	0.16	0.19	0.21	
R&D funded by GOV (% of GDP)	0.2	0.16	0.16	0.16	0.15	0.18	0.2		
BERD (% of GDP)	0.16	0.23	0.19	0.15	0.17	0.24	0.15	0.11	
Research excellence composite indicator (Rank)	28	28	28	27	23	25			
Percentage of scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country		4.56	4.06	3.64	6.15	3.71			
Public-private co-publications per million population	3.24	1.89	1.93	0.98	0.49	0.49	0.49		
World Share of PCT applications	0.02	0.02	0.01	0.02	0.01	0.01	0.01		
Global Innovation Index				33	34	33	34	33	

Data sources: various, including Eurostat, European Commission and International scoreboard data.

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