RIS3 in the context of Europe2020: The Role of Universities

March 25, 2015
Outline

1) Latvian RIS3 – a strategy for transformation of economy towards production of higher added value products and services
2) Role of Universities in implementing RIS3
3) Implementation and monitoring of RIS3
RIS3 challenge: productivity

RIS3 aims to correct a policy failure to boost growth in all regions of EU by creating future domestic capabilities and comparative advantage, especially in sectors where small incremental changes can leverage substantial return.

In a nutshell - How to enable significant productivity improvement?
Labour productivity
Euro per hour worked (ESA95), 2004-2008-2013
Labour productivity per hour worked

Euro per hour worked, index 2005 = 100, (ESA95), 2004-2008-2013
RIS3 challenge: Target of 3% R&D investment

The Core (Innovations Leaders):
- Fewer in numbers
- Higher prosperity
- Combination of scale and diversity
- Higher international connectedness
- Agglomeration advantages: learning, sharing and matching of agents, actors and activities, and opportunities for the pooling of financial risk across sectors and firm types

The Non-core (Modest, Moderate and Followers):
- Larger in numbers
- Lower prosperity
- Higher industry specialization
- Higher local embeddedness

Higher levels of entrepreneurship and innovation observed in core reg. Adaptation and application of ICTs across a wide range of industries have exacerbated the differences between core and none-core regions (McCann and Ortega-Argilés, 2011)
RIS3 challenge: priorities for intervention

**Priority interventions:**
- Linkages & Entrepreneurship
- Firm investments
- Innovators
- Open, excellent research system

**Relative strength:**
Human resources

*Source: IUS 2014*
RIS3 for Latvia: “Hybrid Strategy”

Transformation of economy towards higher added value, productivity and more effective usage of resources

Objective: to increase innovation capacity and to create innovation system that promotes growth of economy

Directions:
1. Structural changes of production and export in the traditional sectors of the economy;
2. Growth in sectors where there is or is likely to create products and services with high added value;
3. Branches with significant horizontal impact and contribution to economic transformation.

Priorities:
1. High added value products
2. Productive Innovation System
3. Energy Efficiency
4. Modern ICT
5. Modern education
6. The knowledge base (Bio-economy; Biomedicine, medical technologies, biopharmacy and biotechnology; Smart materials, technology and engineering, Smart energy; ICT)
7. Polycentric development

Specialization areas:
1. Knowledge-based bio-economics
2. Bio-medicine, medical technologies, biopharmacy and biotechnologies;
3. Advanced materials, technologies and engineering systems
4. Smart energy
5. Information and communication technologies.
RIS3 challenge: Central Role of Universities

About 70% of research is performed in Universities.

TOP 10 research performers in 2013, ordered by external funding attracted

- External funding 2013 (including FP7)
- Gov.funding 2013
- Industry funding

€ 45,004,690 - Total
€ 30,838,539 - Universities, (including LU CFI)
RIS3 challenge: Central Role of University

Role of Universities – Knowledge Hubs:
• to develop **sufficiently diverse knowledge base** (supply side)
• to **boost innovation capacity** of firms thru provision of human capital and access to knowledge (demand side)
• to **generate S&T human capital that is sufficiently embedded and connected** (absorptive capacity)
• to **pool resources across sectors and regions** (innovation ecosystem).

Proven - Public investment in scientific research in universities leads to:
• Economic growth through an **increase in private sector productivity**
• Beneficial economic and societal impacts through **increased interaction between the academic and private sectors**
• Public investment in research increases rather than diminishes **private sector investment** (complimentarity)

Role of Government – Enabler
## RIS3 challenge: Central Role of University

<table>
<thead>
<tr>
<th>University</th>
<th>R&amp;D Personel</th>
<th>External funding 2013 (including FP7)</th>
<th>Gov.funding 2013</th>
<th>Industry funding</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Latvia</td>
<td>933</td>
<td>€ 4,822,764</td>
<td>€ 10,250,542</td>
<td>€ 982,608</td>
<td>€ 16,055,914</td>
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<tr>
<td>Riga Technical University</td>
<td>763</td>
<td>€ 3,623,368</td>
<td>€ 4,021,823</td>
<td>€ 1,088,062</td>
<td>€ 8,733,253</td>
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<tr>
<td>Daugavpils University</td>
<td>126</td>
<td>€ 863,312</td>
<td>€ 891,936</td>
<td>€ 15,545</td>
<td>€ 1,770,793</td>
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<tr>
<td>Institute of Organic Synthesis</td>
<td>226</td>
<td>€ 510,446</td>
<td>€ 1,608,383</td>
<td>€ 3,071,708</td>
<td>€ 5,190,537</td>
</tr>
<tr>
<td>University of Agriculture of Latvia</td>
<td>78</td>
<td>€ 509,837</td>
<td>€ 458,205</td>
<td>€ 985,050</td>
<td>€ 1,953,091</td>
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<tr>
<td>Institute of Wood Chemistry</td>
<td>75</td>
<td>€ 468,157</td>
<td>€ 802,407</td>
<td>€ 115,985</td>
<td>€ 1,386,549</td>
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<tr>
<td>UL Institute of Solid State Physics</td>
<td>133</td>
<td>€ 393,444</td>
<td>€ 1,445,644</td>
<td>€ 154,631</td>
<td>€ 1,993,718</td>
</tr>
<tr>
<td>Riga Stradiņš University</td>
<td>161</td>
<td>€ 232,044</td>
<td>€ 1,872,850</td>
<td>€ 179,967</td>
<td>€ 2,284,861</td>
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<tr>
<td>Biomedical Study Centre</td>
<td>127</td>
<td>€ 171,532</td>
<td>€ 2,388,008</td>
<td>€ 134,895</td>
<td>€ 2,694,435</td>
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<tr>
<td>Institute of Forest Science &quot;Silava&quot;</td>
<td>143</td>
<td>€ 80,014</td>
<td>€ 1,188,353</td>
<td>€ 1,673,172</td>
<td>€ 2,941,539</td>
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<tr>
<td>Total</td>
<td>2765</td>
<td>€ 11,674,918</td>
<td>€ 24,928,150</td>
<td>€ 8,401,622</td>
<td>€ 45,004,690</td>
</tr>
</tbody>
</table>
RIS3: Role of Government – Enabler

Core programmes to implement Science, Technology & Innovation Guidelines (2013) adopted in 2014 and in implementation:

1) **Structural reform and fostering excellence of Research Institutions** - concentrating research resources and developing research programs for internationally competitive Research Institutes and Universities (Knowledge Hubs) (10 MEUR);

2) **Reform of HE funding system** – introducing performance model, integrating study with research, and aligning the two with needs of sustainable economic development (5.5 MEUR for 2015)

3) **RIS3 implementation and monitoring system** - institutionalizing entrepreneurial discovery, excellence, relevance and sustainability.
Outcomes of RIS3 process:
Specialization areas as coordination and discussion platform

Bringing together research and industry organizations, HE institutions and policymakers for setting priorities, designing policy instruments and monitoring progress.

- Identification of several frontier technology research fields
- Assessment of development potential of industry
- Assessment of innovation system, S&T human capital, and research institutions

2013: Discovery and innovation domains

2014: Creation of 3-level discussion platform
- Structured discussions in 5 specialization areas
- Innovation council
- Coordinated work between line ministries

2014: Creation of 3-level discussion platform
- Prioritization of public investments
- Creation of monitoring system that facilitates the discovery process and tracks progress

2015: Implementation and monitoring
The concept of the RIS3 monitoring: Three-level monitoring system

The overall goals of the RIS3

RIS3 macro level indicators

RIS3 micro level indicators

- INDICATORS achievable by the planned support tools/programs;
- DATA obtained from the management information system, project applications and reports.

Defined in:
(A) NDP 2014-2020;
(B) Latvia’s NRP for “Europe2020” implementation;
(C) National Industrial Policy Guidelines 2013–2020;

The institutions involved:
LSISC, MoES (+SEDA)
MoE (+IDAL,)
MoF (+CFCA, DFI)
MoA (+RSS)
MoEPRD, Cross-Sectoral Coordination Centre
<table>
<thead>
<tr>
<th>OVERALL GOALS (3)</th>
<th>Base value</th>
<th>2017</th>
<th>2020</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Investment in R&amp;D (% from GDP)</td>
<td>0.6 (2013)</td>
<td>1.2</td>
<td>1.5</td>
<td>CSB</td>
</tr>
<tr>
<td>(2) Position in the EU Innovation Union Scoreboard</td>
<td>modest (2013)</td>
<td>modest</td>
<td>follower</td>
<td>EC</td>
</tr>
<tr>
<td>(3) Efficiency in the processing industry (EUR per employee)</td>
<td>20,126 (2013)</td>
<td>24,500</td>
<td>29,000</td>
<td>CSB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MACRO LEVEL INDICATORS (6)</th>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Private sector investments in R&amp;D (% of total investments)</td>
<td>21.8 (2013)</td>
<td>46</td>
<td>48</td>
<td>CSB</td>
</tr>
<tr>
<td>(2) Proportion of innovative companies (% of all companies)</td>
<td>30.4 (2012)</td>
<td>35</td>
<td>40</td>
<td>CSB</td>
</tr>
<tr>
<td>(3) Proportion of high-technology and medium-high-technology sectors in the export of Latvian goods (%)</td>
<td>23.8 (2012)</td>
<td>27</td>
<td>31</td>
<td>CSB</td>
</tr>
<tr>
<td>(4) The number of R&amp;D personnel (public, private sector)</td>
<td>5593 (2013)</td>
<td>6300</td>
<td>7000</td>
<td>CSB</td>
</tr>
<tr>
<td>(5) A smaller number of stronger publicly-funded scientific institutions</td>
<td>42 (2013)</td>
<td>30</td>
<td>20</td>
<td>MoES</td>
</tr>
<tr>
<td>(6) Proportion of graduates (ISCED level 5 and 6) in the STEM fields from the total number of graduates, %</td>
<td>19 (2012)</td>
<td>25</td>
<td>27</td>
<td>MoES</td>
</tr>
</tbody>
</table>
RIS3 for Latvia: Specialization Areas

**Example of Advanced materials, technologies and engineering systems:**

**Fields and subfields of science with greatest potential for boosting competitiveness of economy**
Offer of scientific institutions for specific niche selection: implant materials, composites, thin layers and coatings. Merchants offer - machinery (including electrical equipment), mechanisms and industrial machines.

**Industry organizations**
Groglass Ltd., JSC Sidrabe, Z-Light Ltd., JSC Jauda, JSC Valmieras stikla šķiedra, JSC Lode

**Main research institutes**
University of Latvia, Institute of Solid State Physics, Riga Technical University

**Examples of Connectedness**
Institute of Solid State Physics: Center of Advanced Materials Research and Technology Transfer (CAMART2) (Horizont2020 WIDESPREAD1-2014:Teaming action)
RIS3 for Latvia: Specialization Areas

Example of Biomedicine, medical technologies, biopharmacy and biotechnology:

Fields and subfields of science with greatest potential for boosting competitiveness of economy

1) Chemical and biotechnological methods and products for obtaining pharmaceutical and bio-active substances; 2) Research and development of new and existing human and veterinary medicinal products; 3) Molecular and individualized treatment and diagnostic methods and cell technologies; 4) Functional food, medical cosmetics and bioactive natural products.

Industry organizations
JSC Olainfarm, JSC Grindeks, JSC Dzintars, Madara Cosmetics Ltd., Silvanols Ltd., Riga East University Hospital Ltd., Pauls Stradins Clinical University Hospital Ltd.

Main research institutes
University of Latvia, Riga Stradins University, Latvian Institute of Organic Synthesis, Latvian Biomedical Research and Study Centre

Examples of Connectedness
The Latvian Institute of Organic Synthesis: project ENABLE (European Gram Negative Antibacterial Engine) – IMI Programme; Latvian Biomedical Research and Study Centre: FP7 project Vector-borne Risks for Europe: Risk assessment and control of West Nile and Chikungunya virus (VECTORIE)
Example of Knowledge-based bio-economics:

**Fields and subfields of science with greatest potential for boosting competitiveness of economy**

(1) Sustainable and productive forest cultivation in variable climate conditions;
(2) Innovative, competitive (niche) products with high added value;
(3) Full usage of wood biomass for the chemical processing and energy;
(4) Innovative, risk-reducing plant and animal breeding technologies;
(5) Innovative high added-value niche product development from traditional and non-traditional agricultural plant and animal materials;
(6) Technological solutions for plant and animal breeding and processing side-products usage for obtaining high added-value products;
(7) Food safety.

**Industry organizations**
JSC Latvijas finieris, SJSC Latvijas Valsts meži, Pure chocolate Ltd., Fortum Ltd.

**Main research institutes**
Latvian University of Agriculture, Latvian State Institute of Wood Chemistry, Institute of Food Safety, Animal Health and Environment - "BIOR"
Example of Smart energy:

Fields and subfields of science with greatest potential for boosting competitiveness of economy

Electrical and smart grid studies using mathematical modelling methods, research on energy-efficient solutions in companies, research on applications of electricity in transport, bioenergy solutions, and solutions for energy self-sufficiency. EM offer: (1) Price of resources, (2) Intensity of consumption on energy resources, (3) ES climate and energy frame 2030.

Industry organizations
SJSC Latvijas gāze, JSC Rīgas siltums, SJSC Latvenergo, JSC Komforts, Grandeg Ltd., Sun Investments Ltd., Sinergo Ltd., Altenergo Ltd., Enefit Ltd.

Main research institutes
Riga Technical University, Institute of Physical Energetics, The Institute of Physics of University of Latvia
RIS3 for Latvia: Specialization Areas

Example of Information and communication technologies (ICT):

**Fields and subfields of science with greatest potential for boosting competitiveness of economy**

Specialization niches (cyberphisical systems, photonics, biophotonics, micronanoelectronics, etc.) and horizontal platform for collaboration in solving society - important matters (such as health, transport, environment, public safety, etc.) for such sectors as an innovative knowledge management, system modelling and software development methods and tools; innovative sectors of ICT hardware (hardware) and software (software) applications; language processing and semantic web; large-scale data and knowledge infrastructure; information security and quantum computers; computer system testing methods.

**Industry organizations**

Lattelecom Ltd., Tilde Ltd., JSC Rix Technologies, JSC Exigen Services Latvia, Dati grupa Ltd., JSC SAF Tehnika, Hanzas Elektronika Ltd

**Main research institutes**

Riga Technical University, University of Latvia, Institute of Electronics and Computer Science, Institute of Mathematics and Computer Science

**Examples of Connectedness**

Institute of Electronics and Computer Science, Institute of Mathematics and Computer Science, Riga Technical University – FP7 ARTEMIS projects.
Role of Knowledge Hubs (Universities):

- Develop of sufficiently diverse knowledge base
- Boost innovation capacity of firms
- Generate S&T human capital that is sufficiently embedded and connected
- Pool resources across the sectors and regions