

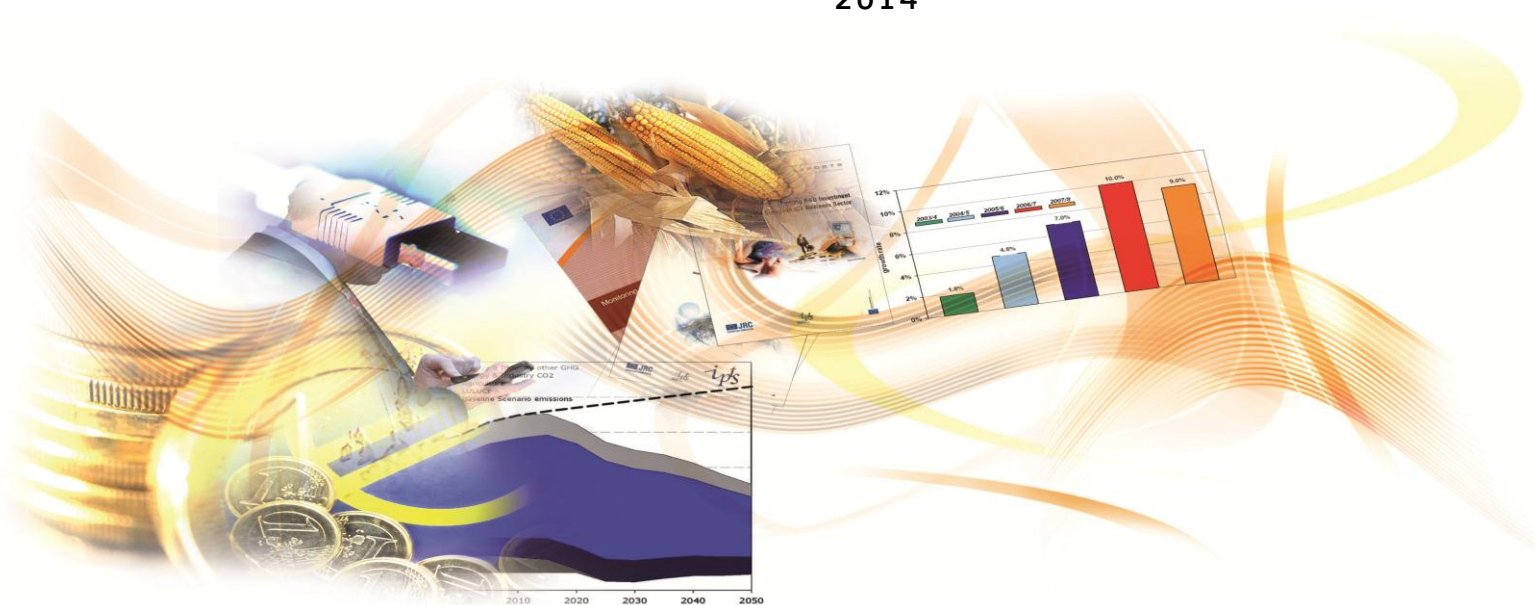


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ERAWATCH Country Reports 2013: Slovak Republic

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Abstract

The Analytical Country Reports analyse and assess in a structured manner the evolution of the national policy research and innovation in the perspective of the wider EU strategy and goals, with a particular focus on the performance of the national research and innovation (R&I) system, their broader policy mix and governance. The 2013 edition of the Country Reports highlight national policy and system developments occurring since late 2012 and assess, through dedicated sections:

- national progress in addressing Research and Innovation system challenges;
- national progress in addressing the 5 ERA priorities;
- the progress at Member State level towards achieving the Innovation Union;
- the status and relevant features of Regional and/or National Research and Innovation Strategies on Smart Specialisation (RIS3);
- as far relevant, country Specific Research and Innovation (R&I) Recommendations.

Detailed annexes in tabular form provide access to country information in a concise and synthetic manner.

The reports were originally produced in December 2013, focusing on policy developments occurring over the preceding twelve months.

ACKNOWLEDGMENTS AND FURTHER INFORMATION

This analytical country report is one of a series of annual ERAWATCH reports produced for EU Member States and Countries Associated to the Seventh Framework Programme for Research of the European Union (FP7). [ERAWATCH](#) is a joint initiative of the European Commission's [Directorate General for Research and Innovation](#) and [Joint Research Centre](#).

The Country Report 2013 builds on and updates the 2012 edition. The report identifies the structural challenges of the national research and innovation system and assesses the match between the national priorities and the structural challenges, highlighting the latest developments, their dynamics and impact in the overall national context.

The first draft of this report was produced in December 2013 and was focused on developments taking place in the previous twelve months. In particular, it has benefitted from the comments and suggestions of Katerina STANCOVA from JRC-IPTS. The contributions and comments from DG-RTD are also gratefully acknowledged.

The report is currently only published in electronic format and is available on the [ERAWATCH website](#). Comments on this report are welcome and should be addressed to jrc-ipts-erawatch-helpdesk@ec.europa.eu.

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EXECUTIVE SUMMARY

The Slovak economy avoided recession and grew by relatively low rate 2.0% in 2012. Estimated growth rate for 2013 is 0.9%. Low growth disabled job creation and affected government finance and expenditure on R&D. Progress towards developing an efficient system of research and development has been limited so far. Gross expenditure on research and development (GERD) as per cent of GDP was 0.82%, far below the EU27 average (2.07%) in 2012. Slovakia accounts for extremely low level of R&D inputs and outputs. Total Slovak GERD (€585.2m) was dominated by three major flows i) government to government sector (15.8%), (ii) government to higher education sector (23.0%) and (iii) business to business sector (33.3%) in 2012. Industry – academia flows were quite unimportant. The flows from business to government, and business to higher education sector accounted for 3.2% and 1.1% total funding flows in 2012. Structure of flows points to the poor interconnection of the public and private sector. Low levels of R&D inputs corresponded with low level of knowledge-intensive outputs by early 2010s.

The three basic *innovation policy priorities* set in the 2007 Innovation Strategy included: (1) High-quality infrastructure and an efficient system for innovation development; (2) High-quality human resources; and (3) Efficient tools for innovation. The *research policy priorities and policy mix* were set in the [Long-term Objective of the State S&T Policy up to 2015](#) and referred to (1) Higher involvement of S&T in the development of Slovakia, and more intensive participation by S&T in solving economic and social problems in Slovakia; (2) Better conditions for S&T development inside Slovakia, and also for Slovakia's activities within the European Research Area; and (3) Setting targets for S&T development in terms of (a) S&T policy co-ordination, (b) building and modernising R&D infrastructure, (c) institutional reform of public R&D, (d) reform of public financial support to R&D, (e) international co-operation, and (f) monitoring and evaluation of public R&D system.

The key challenges in the national research and innovation system have been continuing for many years:

- Weak R&D system and poor co-operation between academia and industry sectors;
- Underdeveloped system of innovation governance;
- Dual economy;
- Low shares of domestic innovative enterprises limiting competitiveness of the country;
- Inadequate national research and innovation funding.

Slovakia accounted for extremely low spending on R&D and poor performance by most indicators included in the Summary Innovation Index. Slovak economy was largely dominated by branches of the multinational companies (MNCs). The MNCs were attracted by low cost of inputs (labour in particular), geographical location of Slovakia and favourable tax conditions. The MNCs did research in their headquarters and had limited interest in shifting their applied/industrial research to Slovak Universities and research institutes. Slovak research and innovation system has increasingly relied on the EU resources, while national funding decreased in importance since 2007. Policy mix addressing the abovementioned challenges relied on means from the [Operational Programme Research and Development](#) (OPRD) and the Operational Programme Competitiveness and Economic Growth (OPCEG) and supported policy measures aimed at infrastructure building, creating linkages between the academia and industry sectors, technology transfers, and venture capital schemes. The most recent innovation policies indicate a

positive shift towards more sophisticated innovation policies in the near future in terms of new agendas (support to clusters), target groups (MNCs), and modes of funding (innovation vouchers). The most important system change relates to activities of the Slovak Government Council for Science, Technology and Innovation (SGCSTI). The SGCSTI was established by the Government Resolution No. 620/2011 on 28 September 2011, but met for the first time on 9 April 2013 to discuss the initial draft of the RIS3 document. The Council is chaired by the Prime Minister. It is a cross-cutting body and involves representatives of inter alia key central government ministries, HEIs, research institutions, industry and employer associations. The main task of the Council is to reduce fragmentation and secure effective work of the public R&D&I institutions. The RIS3 document was passed via the Government Resolution no. 665/2013 on 13 November 2013. The document identifies key areas of economic specialisation: (1) Automotive and mechanical engineering industries; (2) Consumer electronics and electrical equipment; (3) Information and communication technologies and services, and (4) Production and processing of iron and steel. The document also lists 'prospective areas of specialisation', such as (a) automation, robotics and digital technology; (b) processing and increasing the value of light metals and their alloys; (c) production and processing of plastics; (d) creative industry, and (e) increasing value of domestic raw material base.

National progress towards Innovation Union Commitments was uneven in 2013 Slovakia. Good results were achieved in strengthening the knowledge base. Means from the OPRD supported infrastructure building in 67 Centres of Excellence (€231.84m), 93 Research and Development Centres (€190m), 8 Competence Centres (€57.59m), and 11 University Science Parks (€300m). The OPCEG invested €968.3m from the ERDF and €170.9m from the Slovak state budget in period 2007-2013. Bulk of assistance supported purchase of new technologies by Slovak small and medium enterprises (SMEs) in manufacturing industries and applied research projects (about €395m by September 2013). The OPRD and OPCEG also back the JEREMIE initiative, and provide risk capital for SMEs (€125m). Less progress was done in public procurement of innovative goods and services. Implementation of the major e-government programmes (e-health, and integration of tax, duties and social security systems) was lagging behind in 2013. The Smart Specialisation Strategy (RIS3) is the first policy document, which address societal challenges and social and territorial cohesion (multi-ethnic society, population ageing) in Slovakia. The document also contains several policy measures aimed at the joint programming and the European Innovation Partnerships.

The Slovak Government passed several policy documents (RIS3, 2013 National Reform Programme) supporting Slovakia's progress towards the ERA priorities. **ERA priority 1: More effective national research systems:** The Smart Specialisation (RIS3) document presents far-reaching plans for reform of the key research performers and funders. **ERA priority 2: Optimal transnational co-operation and competition:** Joint research agendas addressing grand challenges and joint programming were insufficiently articulated in Slovak research policies. The Ministry of Education, Science, Research and Sport plans finishing roadmap by the end of 2013 and the Action Plan on the ESFRI Roadmap in 2014. **ERA priority 3: An open labour market for researchers:** Slovakia implemented the Blue Card Directive in 2012. The Slovak Academic and Information Agency manages Slovak version of the EURAXESS webpage since 2004. Poor research performance and low wages, however, did not contribute to Slovakia's attractiveness as a destination for research. **ERA priority 4: Gender equality and gender mainstreaming in research.** By 2013 Slovakia accounted for relatively good gender balance in R&D in terms of total employment and researcher numbers. Females, however, were rather underrepresented in top managerial positions and boards of research bodies. Gender equality is pronounced in generic laws, as the Slovak Constitution (2001), Labour Code Law (2011) and the 365/2004 Antidiscrimination Law. **ERA priority 5: Optimal circulation, access to and transfer of**



scientific knowledge including via digital ERA: The Slovak Government used means provided by the [Operational Programme Research and Development](#) (OPRD) and implemented two national projects promoting access to and preservation of scientific information, and two national projects promoting knowledge transfer: Policies for research and education-related public e-infrastructures and for associated digital research services are implemented by the Slovak Academic Network (SANET). The SANET provides the TERENA Certificate Services and the Eduroam services.

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1. BASIC CHARACTERISATION OF THE RESEARCH AND INNOVATION SYSTEM

The Slovak Republic has area of 49,034 square kilometres and population of 5.4 million. It accounts for 1.17% of area and 1.08% of population of the EU27. Slovak per capita gross domestic product (GDP) (based on purchasing power parities) was €19,100 (74.6% of the EU27 average) in 2012. Slovak GDP grew by 4.4% in 2010, 3.0% in 2011 and 1.8% in 2012. The Eurostat estimated growth in Slovak GDP for 0.9% in 2013.

Slovak gross expenditure on research and development (GERD) was €585.2m (0.82% of GDP) in 2012 (2009: 0.48%). The [2013 National Reform Programme](#) set 2020 targets for GERD and the business expenditure on research and development (BERD) to 1.2% and 0.8% respectively. Total Slovak GERD (€585.2m) was dominated by three major flows i) government to government sector (15.8%), (ii) government to higher education sector (23.0%) and (iii) business to business sector (33.3%) in 2012. Industry – academia flows were quite unimportant. The flows from business to government, and business to higher education sector accounted for 3.2% and 1.1% total funding flows in 2012. Structure of flows points to the poor interconnection of the public and private sector. Slovakia ranked to the poorest research and innovation performers in the EU27. The 2013 Innovation Union Scoreboard (IUS) data indicates that Slovakia has made a modest progress towards developing knowledge-based economy since 2009. The state budget and Structural Funds are main sources of public support to R&D in Slovakia. The State Budget is major source of national funding for public higher education institutions (HEIs) and the [Slovak Academy of Sciences](#) (SAS). Most national funding supports institutional finance. The Structural Funds have provided bulk of the project funding in Slovakia since 2008. Combined competitive grants from the national and Structural Fund resources provided over 30% of the total government allocation to HEIs and SAS in 2012.

The governance structure of the Slovak research system changed little over last decade. The top governance body in the field of science and technology was the Ministry of Education, Science, Research and Sports (MESRS). The MESRS is responsible for policy- and decision-making in the field of science and technology (Figure 1). National science and technology policy is prepared and coordinated by the MESRS with co-operation of other ministries (the Ministry of Economy ME, in particular), the Slovak Academy of Sciences (SAS), higher education institutions (HEIs) and associations of employers, and industrial research organisations, respectively.

The most important system change related to activities of the Slovak Government Council for Science, Technology and Innovation (SGCSTI). The SGCSTI was established by the Government Resolution No. 620/2011 on 28 September 2011, but met for the first time on 9 April 2013 to discuss the first draft of the RIS3 document. The final version of the RIS3 document was passed via the Government Resolution no. 665/2013 on 13 November 2013. The SGCSTI is chaired by the Prime Minister. It is a cross-cutting body and involves representatives of *inter alia* key central government ministries, HEIs, research institutions, industry and employer associations. The main task of the Council is to reduce fragmentation and secure effective work of the public R&D&I institutions. Since 2007, responsibilities for the research and innovation policies are separated between the Ministry of Economy (ME) and the MESRS. Innovation policy measures are implemented by the ME and its agencies. The ME drafted the 2007 [Innovation Strategy](#) and 2008 Innovation Policy and the [2011 Innovation Policy](#) documents. It also established the Slovak Innovation and Energy Agency (SIEA) in 2007. This organisational

division was prompted by introduction of the Structural Fund programmes. The ME implements the Operational Programme of Competitiveness and Economic Growth (OPCEG). The MESRS implements the [Operational Programme Research and Development](#) (OPRD) and the Operational Programme Education (OPE). As to manage the OPRD and OPE, the MESRS established the Agency of the MESRS for the Structural Funds of the European Union (ASFEU). The RIS3 document suggested some important changes in innovation governance and identified key areas of economic and technology specialisation (see chapter 2.7 for more details).

Slovakia used to be a centralised country. The self-governing regions were created as late as in 2002 and got no legislative powers in higher education, research, development, and/or innovation policies. These activities have traditionally been considered matters of central government. There are no regional research or innovation councils.

The MESRS supports basic and applied research via state budget allocations and competitive grants given to a network of organisations and agencies important for development of science & technology (S&T) and higher education. The key research performers include:

- The [Slovak Academy of Sciences](#) (SAS) is a research body providing the bulk of basic research in Slovakia. The SAS had budget total €89.29m (of which €60.08m institutional grant from the Slovak Government) and employed 3211 people in full-time equivalent (1812 of which held a scientific degree and 419 were PhD students, the rest of employees are technical staff) in 2013 (source: The 2013 Annual Report of the SAS).
- Higher Education Institutions. There were 23 public and 13 private higher education institutions in Slovakia (as of 2013). Public support to HEIs was €443.4m in 2013. Estimated share of public expenditure on the university system in GDP was 0.62% in 2011, 0.62% in 2012 and 0.61% in 2013.

The key funding agencies include:

- The [VEGA](#) is funding grant agency for the MESRS, and the SAS. The VEGA allocated €13.56m to 2094 research grants in 2013 (source: the VEGA webpage).
- The [Research and Development Agency](#) (RDA) provides mostly applied research grants for public and private bodies. The RDA budget increased from €0.15m in 2001 to €29.97m in 2013.

Most research was performed in the business sector (41.3% of total expenditure in the R&D), public research facilities (24.5%) and higher education facilities (34.0%) in 2012. Private non-profit sector accounted for less than 0.1% of total outlays in the same year. Data on research by businesses are quite scarce in Slovakia. The 2006-2013 EU Industrial R&D Investment Scoreboards included no Slovak company.

The three basic *innovation policy priorities* set in the 2007 [Innovation Strategy](#) included: (1) High-quality infrastructure and an efficient system for innovation development; (2) High-quality human resources; and (3) Efficient tools for innovation. The *research policy priorities and policy mix* were set in the [Long-term Objective of the State S&T Policy up to 2015](#) and referred to (1) Higher involvement of S&T in the development of Slovakia, and more intensive participation by S&T in solving economic and social problems in Slovakia; (2) Better conditions for S&T development inside Slovakia, and also for Slovakia's activities within the European Research Area; and (3) Setting targets for S&T development in terms of (a) S&T policy co-ordination, (b) building and modernising R&D infrastructure, (c) institutional reform of public R&D, (d) reform of public financial support to R&D, (e) international co-operation, and (f)

monitoring and evaluation of public R&D system. Policy mix relies on means from the OPRD and OPCEG and supports policy measures aimed at infrastructure building, creating linkages between the academia and industry sectors, technology transfers, and venture capital schemes. The most recent innovation policies indicate a positive shift towards more sophisticated innovation policies in the near future in terms of new agendas (support to clusters), target groups (MNCs), and modes of funding (innovation vouchers).

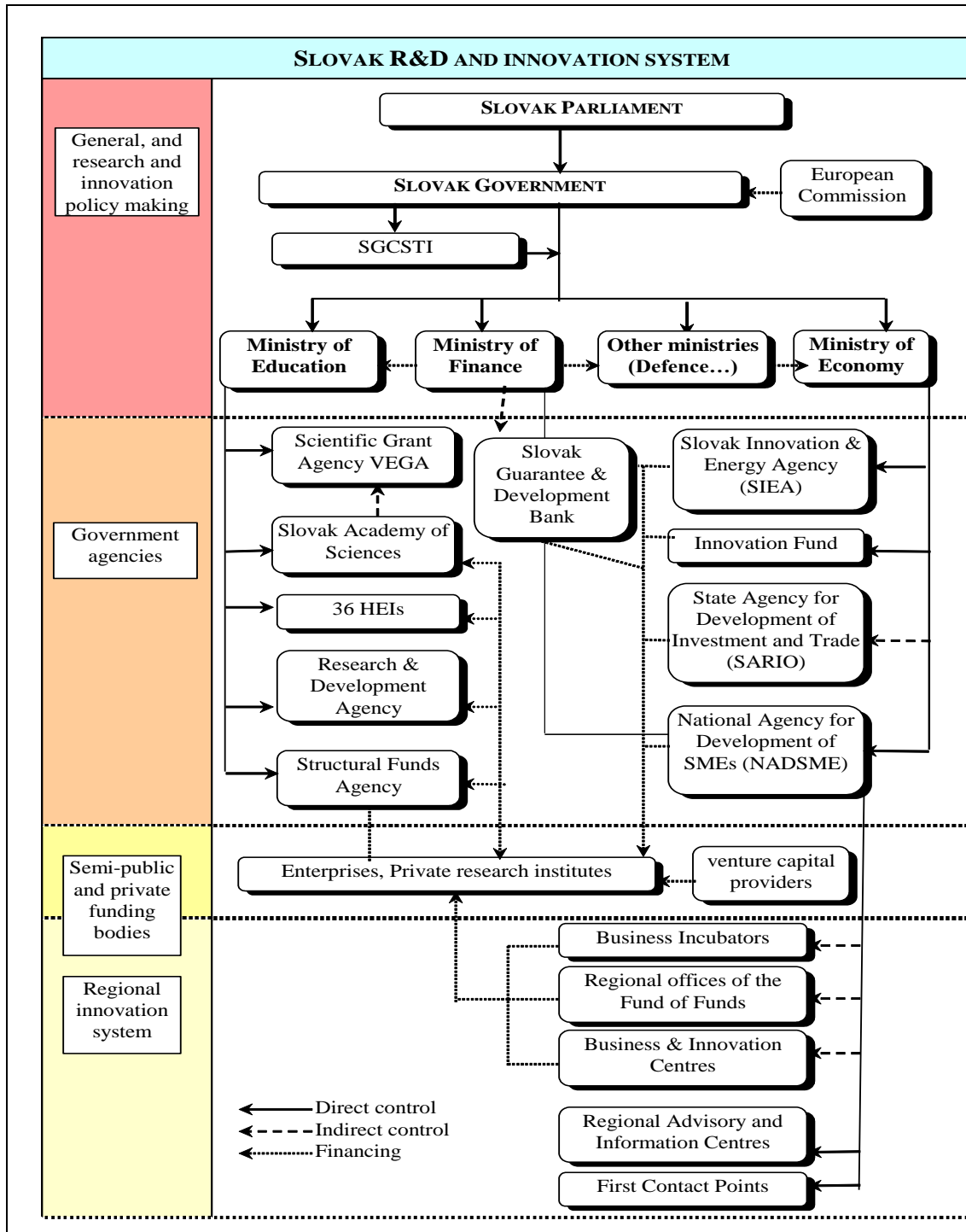


Figure 1: Structure of the Slovak research and innovation system

2. RECENT DEVELOPMENTS OF THE RESEARCH AND INNOVATION POLICY AND SYSTEM

2.1 National economic and political context

The Slovak economy avoided recession and grew by relatively low rate 2.0% in 2012. Estimated growth rate for 2013 is 0.9%. Low growth disabled job creation and affected government finance. The unemployment rate reached 14.0% in 2012 and it is estimated to go up to 14.5% in 2013. The budget deficit was 4.3% GDP in 2012 and it is estimated to go up to 3.0% GDP in 2013. The budget deficit also was affected by the widespread tax fraud¹. Gross government debt as per cent of GDP rose to 52.2% in 2012 and it is estimated to go up to 54.9% in 2013. The constitutional law on debt ceiling sets 3% cuts in all public expenditure once the debt/GDP ratio surpasses 55%. The same law sets that the Government must adopt zero-deficit budget should the debt/GDP ratio reach 57%.

The Slovak Government decided to support job market with stimuli for young unemployed, and limit other expenditure and government debt. The Ministry of Finance suggested cutting SAS budget by 18% (€10.6m) in 2014. The Ministry of Interior asked SAS to merge its 64 institutes and service organisations to 9 larger units. The SAS argued that its budget did not change in last five years in nominal terms and decreased in real terms. The SAS also suggested that its internal structure should be set by the law on the SAS transformation (currently under preparation) and not by the Ministry of Interior. In December 2013 the Action plan to fight tax fraud generated positive results. Tax collection somewhat improved, budget deficit narrowed and the Slovak Government withdrew its plans for cutting SAS budget.

2.2 Funding trends

2.2.1. Funding flows

The 2020 national targets for shares of GERD and BERD in GDP (set by the [2013 National Reform Programme](#)) are 1.2% and 0.8% respectively. The GERD target may be realistic provided that the EU assistance to Slovak research system continues. The BERD target is more challenging, because of extremely low R&D spending by Slovak firms.

Major long-term trends in research funding in Slovakia included (a) decline in research funded by private sector and increase in relative importance of government finance, (b) decrease in importance of applied research and increasing importance of basic research, (c) decrease in

¹ Nominal rate of the value added tax (VAT) is 20% in the Slovak Republic. Effective rate of the VAT collection, however, dropped from 15.4% in 2002 to 12.4% in 2012. The former governments tended to offset missing VAT receipts via (i) increases in income taxes and (ii) budget cuts (including expenditure on HEIs and the SAS). In May 2012 the Slovak Government finally adopted the Action plan to fight tax fraud containing 50 specific measures primarily aimed at improving the collection of VAT. The Action plan seemed to work and effective VAT collection increased to 13.0% by December 2013. Sources: The 2013 National Reform Programme of the Slovak Republic and Institute of the Financial Policy of the Ministry of Finance (2013).

shares of engineering and increasing shares of natural sciences (related to basic research), and (d) disappearing thematic focus while increase in non-oriented research and general University funds (Figure 2). These trends relate to overall fall in research spending, and decline in the domestic private research base in the 1990s in particular. Share of GERD in GDP was 3.88% by 1989, but 0.82% in 2012 (Table 1, source: Eurostat). Number of researchers was declining simultaneously with the GERD shares in GDP (Figure 2).

Table 1 Basic indicators for R&D investments

	2009	2010	2011	2012	EU27 (2012)
GDP growth rate	-4.9	4.4	3.0	1.8	-0.4
GERD (% of GDP)	0.48	0.63	0.68	0.82	2.07
GERD (euro per capita)	56.0	76.8	86.9	108.6	507
GBAORD - Total R&D appropriations (€ million)	228.973	252.86	323.598	178.361	90,344.85
R&D funded by Business Enterprise Sector (% of GDP)	0.17	0.22	0.23	0.34	1.31
R&D performed by HEIs (% of GERD)	25.01	27.64	34.95	34.03	23.70
R&D performed by Government Sector (% of GERD)	41.05	42.09	37.18	41.35.	12.33
R&D performed by Business Enterprise Sector (% of GERD)	33.89	29.96	27.66	24.52.	63.10
Share of competitive vs. institutional public funding for R&D	22.22	21.16	9.63	8.56	n.a.

Sources: Eurostat and author's own computations.

The Slovak research system relies more and more on European resources. Support to knowledge-based economy accounts for an impressive increase in the period 2007-2013 (source: Slovak Government: the National Reference Framework for the Slovak Republic for period 2007-2013). Total assistance by Structural Funds to human resources, R&D and innovation was some €436m in the period 2004-2006 and increased to €5b in period 2007-2013. The European assistance, however, outnumbered national funding. This trend has been evident since the outbreak of the economic crisis in 2008. The Slovak Government pointed to the availability of the European resources for R&D funding and cut national support to research and development. The 2012 State Budget Law envisaged total support of €501.41m, of which €404.41m (81%) was from the Operational Programme Research and Development (OPRD). The 2014 State Budget law set total public support to research and development to €384.6m (2013: €491.80m). Decrease in spending by the OPRD (€285.95m in 2014 and €392.36m in 2013) is major factor behind total decrease in public R&D spending. The Operational Programme Research and Development provided some 80% of total public support to R&D in Slovakia in 2013 and 74% in 2014. The austerity measures affected also national R&D funding. Budget of the Research and Development Agency (most important R&D funder in Slovakia) dropped from €27.97m in 2013 to €26.27m in 2014.

Usual co-financing rate by the ERDF/ESF (for measures provided under the OPRD) is 85%-95%. Innovation policy measures almost completely rely on assistance provided by the Operational Programme Competitiveness and Economic Growth, and usual co-financing rate by the ERDF/ESF is 85%.

Slovak research funding relies almost exclusively on national, ESF and ERDF grants. In 2009 the tax stimuli were first time used though to a limited extent. Institutional finance was mostly supported from the national resources. Project finance mostly relied on the Structural Funds:

- **Institutional funding** supports basic research in HEIs and is provided directly (via block grants) from the state budget divisions (ministries and other central authorities). Total volume of institutional funding from the state budget was €39.43m in 2010, €106.42m in 2011, €142.63m in 2012 and €142.63m in 2013. The leap in funding between 2010 and 2011/12 is a statistical artefact and refers to change in accounting rules. Most personnel costs on HEI were reshuffled to chapter on research.
- **Project finance** is provided from the national and European resources. The total volume of public support to project finance accounted for €253.73m in 2011². It increased by 7.5 times in the period 2007-2011. The increase is related to the financing of programmes through the Structural Funds.
- The Slovak Parliament passed the 185/2009 R&D Stimuli Law in April 2009. The law provides **tax breaks** for specific activities in applied research. Five firms were supported with €1.3m in 2009 and 15 ones with €1.2m in 2010. The R&D stimuli were provided mostly in form of direct subsidy in 2011. Tax breaks accounted only for 2.1% of total R&D stimuli awarded in 2011 and 27.7% in 2012 (source: the 2007-2012 Annual Reports on R&D). In July 2013 the Slovak Ministry of Education, Research and Sports (MESRS) published new call on stimuli for applied research in 2014-2016. Private firms could apply for stimuli for their R&D projects in specified thematic areas (innovative drugs for the lifestyle diseases, second generation of bio-fuels, communal waste processing, new motors for helicopters, high-tech machinery systems for car shells, and technologies for large mono-crystals). Thematic areas of the stimuli correspond with thematic priorities set by the Danube Strategy. Total volume of stimuli was set to €10.3m.

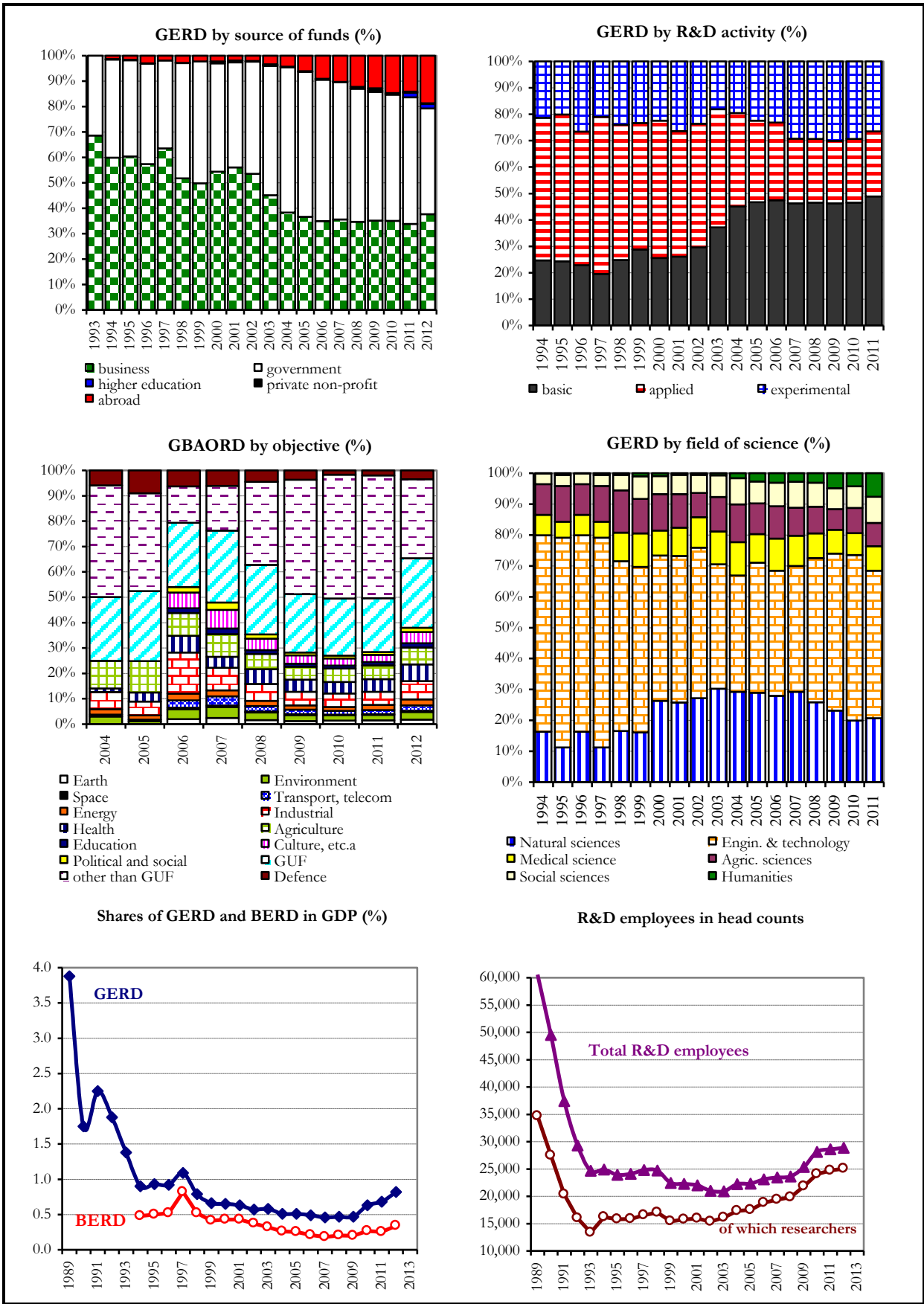
The Slovak research systems accounts for relative high shares of the Structural Fund funding compared to other European Countries. The 2013 State Budget law set that the Operational Programme Research and Development provides some 81% of total public support to R&D in Slovakia in 2013.

Research and innovation policies traditionally were considered matters of central government in Slovakia. Slovak regions have no legislative power in the field of research and innovation. No explicit regional R&I programmes and/or policy measures have been developed in Slovakia. All R&I policy measures are designed and implemented by the Slovak Government or its agencies.

Public-private partnership has had so far rather limited role in leveraging additional funding. The State Budget supported six horizontal and three thematic State Research and Development Programmes (SRDPs) in period between 2003 and 2010. The SRDPs should (among other goals) promote co-operation by private and public sector in research and development. Total support by the state budget was €91.36m and the private sector provided €20.94m in the abovementioned period. No SRDP was launched between 2010 and 2013.

The inter-regional funding has marginal role for research and innovation in Slovakia. The Operational Programme INTERREG IVC supported 23 Slovak firms since 2008. The share of foreign funding in total funding increased from 2.3% in 2000 to 18.7% in 2012. The European Commission and other international organisations generated bulk of the foreign funding in Slovakia in 2012.

² Latest available data by the 2011 Annual Report on R&D. The 2012 Annual Report on R&D did not include comprehensive review of the project finance in Slovakia.



2.2.2. Funding mechanisms

2.2.2.1 Competitive vs. institutional public funding

Competitive institutional funding from national resources is provided via the Vedecká grantová agentúra (VEGA) and Kultúrna a edukačná grantová agentúra (KEGA) grants. The VEGA and KEGA grants help to pay for the overhead costs of research institutions. Competitive project funding from national resources is provided via the [Research and Development Agency](#) (RDA) grants. Share of the abovementioned competitive grants to public HEIs and the Slovak Academy of Sciences was 21.2% in 2010, 9.6% in 2011 and 8.6% in 2012. The change in balance between the competitive and institutional changes, however, was far smaller than statistics show. Since 2011 all salaries of public HEI teachers have been classified ‘research expenditure’ and institutional funding in HEIs increased from 39.43m in 2010 to €106.42m in 2011. Therefore, the budgets of national competitive institutional and project funding schemes changed little in period 2009-2012.

2.2.2.2 Government direct vs indirect R&D funding³

Tax breaks for private R&D performers were introduced in 2009, but have been of minimal importance so far. Slovak public R&D system almost exclusively relies on grants. All schemes supported from the Structural Funds also rely on grants, except for the JEREMIE programme. Tax reliefs are provided via the State Aid schemes. According to the 2012 State Aid report, tax reliefs accounted for 27.7% (€6.13m) of total State Aid in 2012 (source: Ministry of Finance, [the 2012 State Aid Report](#)). Tax reliefs accounted for some 2% of total public national support to R&D in 2012.

2.2.3 Thematic versus generic funding

Slovak research funding tended to be quite generic. Shares of the ‘general advancement of knowledge: R&D financed from general University funds (GUF) other sources than GUF’ in total GBAORD were 61.8% in 2009, 71.3% in 2010 and 69.6% in 2011⁴. In 2012 share of generic funding dropped to 58.5%. The RIS3 document noted lack of thematic and sectorial focus, and indicated prospective sectors of economic specialization (chapter 4.1) and related research themes (chapter 4.3) for the Slovak R&D funding in period 2014-2020. The key research themes include material research, information and communication technologies, biotechnologies and biomedicine, sustainable energy, and environment, agriculture and green technologies.

³ Government direct R&D funding includes grants, loans and procurement. Government indirect R&D funding includes tax incentives such as R&D tax credits, R&D allowances, reductions in R&D workers’ wage taxes and social security contributions, and accelerated depreciation of R&D capital.

⁴ Source: Eurostat (2013): Total GBAORD by NABS 2007 socio-economic objectives.

2.2.4. Research funding vs. innovation funding

Government policies supporting innovation development are set in the [2007 Innovation Strategy](#) for period 2007-2013/15. The Strategy heavily relies on the European resources (Table 1a). Four operational programmes allocate about €1.7b to projects supporting innovation in private and public sector. Projects from the Operational Programme Information of Society (OPIS, policy measures 1.1 and 1.2) allocate €770.4m to e-government projects on public and local level. Digitalisation projects (policy measure 2.1) receive €172.4m and development of broadband networks (policy measure 3.1) €13.2m. Implementation of most OPIS projects was significantly behind schedule by February 2014 (Table 1a). The Operational Programme Competitiveness and Economic Growth (OPCEG) allocates €488.2m to innovation and technology transfers and €106.3m applied research projects (policy measures 1.1 and 1.3). Technology transfers were by far more popular projects among Slovak enterprises. Total demand was three times higher than budget. The Operational Programme Bratislava Region (OPBR) mirrored the OPIS and OPCEG policy measures in the Bratislava Region, but with considerably lower budget (Bratislava did not qualify for assistance under Objective 1). The Operational Programme Research and Development (OPRD) allocated €29.5m to the JEREMIE initiative (see chapter 4.2 for more details).

The OPIS projects were implemented by the Office of the Slovak Government. The Slovak Innovation and Energy Agency (directed by the Ministry of Economy) implemented the OPCEG projects. The Structural Fund Agency of the Ministry of Education, Science, Research and Sports implemented the OPRD projects. The OPBR projects were implemented by the Ministry of Agriculture and Rural Development.

All projects (except for the JEREMIE) were implemented via grants. The OPCEG projects were designed for enterprises (some calls specified SMEs only), while the central and local public administration was recipient of the OPIS projects. JEREMIE initiative offered guaranties for SMEs. The HEIs and the Slovak Academy of Sciences generally were not eligible for the innovation-related OPIS, OPCEG and OPBR schemes. They, however, benefited from generous research infrastructure projects under the OPRD and Operational Programme Education.

Design and structure of policy measures aimed at innovation development were fairly similar in planning periods 2004-2006 and 2007-2013. Slovak national funding for innovation was negligible. The pilot cluster scheme received €0.2m and innovation voucher scheme €0.1m in 2013. Monitoring and assessment of innovation-related projects supported from the Structural Funds coped with underdeveloped techniques. Monitoring reports for particular calls summarise only number of applicants and assistance demanded/awarded. Evaluation reports for operational programmes use to mention some specific problems in implementation of policy measures, but provide no insights on impacts of assistance in terms of increased competitiveness. Introduction of advanced impact assessment techniques is badly needed for efficient allocation of European assistance in planning period 2014-2020.

Table 1a: Structural Fund schemes supporting innovation projects in Slovakia, as of 28.02.2014

Operational programme	Policy measure	Total budget, €m	Projects submitted	Assistance required, €m	Contracted projects	Contracted assistance, €m	Certified eligible costs, €m	Certified costs as % of total budget
OPIS	1.1	602.1	54	1,034.9	44	775.2	357.8	59.4
OPIS	1.2	168.3	48	162.5	22	110.6	21.3	12.6
OPIS	2.1	172.4	37	217.2	18	174.5	57.4	33.3
OPIS	3.1	13.2	1	13.2	1	13.2	0.0	0.0
OPCEG	1.1	488.2	2,950	1,482.0	682	438.8	209.1	42.8
OPCEG	1.3	106.3	392	353.8	86	104.2	42.7	40.1
OPBR	2.1	27.2	233	38.5	154	26.2	25.4	93.1
OPBR	2.2	17.0	240	25.6	123	16.9	3.9	23.1

Source: Central Co-ordination Office of the Slovak Government: National Strategic Reference Framework; [Funds Allocation and List](#).

Notes:

OPIS = Operational Programme Information of Society.

Policy measures: 1.1 Electronisation of public administration and development of electronic services on the central level; 1.2 Electronisation of public administration and development of electronic services on the local and regional level; 2.1 Improvement of the system of acquisition, processing and protection of content from the resources of repository institutions; 3.1 Development of broadband access infrastructure.

OPCEG = Operational Programme Competitiveness and Economic Growth. Policy measures: [1.1 Innovation and technology transfers](#); [1.3 Support of innovation activities in enterprises](#).

OPBR = [Operational Programme Bratislava Region](#). Policy measures: 2.1 Innovations and Technological Transfers; 2.2 Informatisation of Society

English titles of policy measures as stated in official documents. All budgets include the EU and national resources. Information on spending by the JEREMIE initiative (supported from the Operational Programme Research and Development) was not available.

2.3 Research and Innovation system changes

The most important system change relates to activities of the Slovak Government Council for Science, Technology and Innovation (SGCSTI). The SGCSTI was established by the Government Resolution No. 620/2011 on 28 September 2011, but met for the first time on 9 April 2013 to discuss the first draft of the RIS3 document. The SGCSTI also met in May, June and September 2013. It discussed further progress in drafting RIS3 document and the Operational Programme Research and Innovations. It also evaluated the 2012 Annual Report of the Slovak Academy of Sciences, discussed amendment of the 185/2009 Law on the R&D Stimuli, and assessed implementation of the 2007 Innovation Strategy.

The Council statute sets that the SGCSTI is ‘a permanent advisory, initiative and co-ordinating body of the Slovak Government for area of science and technology and innovation’⁵. The Council is chaired by the Prime Minister. It is a cross-cutting body and involves representatives of inter alia key central government ministries, HEIs, research institutions, industry and employer associations. The main task of the Council is to reduce fragmentation and secure effective work of the public R&D&I institutions. The SGCSTI also foresees establishing the Standing Committee on RIS3 implementation. The Committee will be responsible for co-ordinating the implementation and monitoring of RIS3 policies including calls for proposals and reform of key R&D agencies.

⁵ Source: Slovak Government (2013): Statute of the Government Council for Research, Development and Innovations (Article 1); Government Resolution No. 114 of 27 February 2013.

2.4 Recent Policy developments

The most important policy initiatives relate to drafting the Slovak RIS3 Strategy (see chapter 2.7) and the Operational Programme Research and Innovation.

The Slovak Ministry of Economy drafted the 71/2013 law on subsidises to enterprises. The law introduces new target for the government intervention – industry research, experimental development and innovation. Incumbent legislative so far recognised five areas of government intervention: (1) mining, (2) small and medium enterprises, (3) energy sector, (4) consumer protection, and (5) support to manufacturing and services. Subsidies are targeted on personal businesses and companies aiming at increasing their competitiveness via research, development and innovation. The Innovation Voucher scheme was launched under the 71/2013 law in June 2013. The pilot scheme is managed by the Slovak Innovation and Energy Agency (SIEA) and financed from the state budget. The *de minimis scheme* allocates €100,000 in total and value of each voucher was set to €3,500 in 2013.

The MESRS signed contracts on building eight University Science Parks with six Universities in July 2013. The total value of contracts is €280m, of which €15m is provided by the state budget and the rest by the [Operational Programme Research and Development](#) (OPRD). All projects must be completed by June 2015.

2.5 National Reform Programme 2013 and R&I

The [2013 National Reform Programme](#) for the Slovak Republic acknowledges that ‘a fast increase in expenditures on science and research in Slovakia in the past, compared to the countries of the V3 group, was most reflected in an increase in the number of researchers, which had already been relatively high, yet the results do not correspond to the growth in inputs’. The Slovak Government considers ‘insufficient funding, fragmentation of expertise and management system, and unstable support for science and research’ major problems for developing an efficient system of research and innovation. The Slovak Government set goal for increasing expenditure on research and development to 1.2% GDP by 2020. The business sector should provide two thirds of total expenditure. The Government intends concentrating state support to R&D to selected priority areas, where Slovakia has comparative advantage, such as material research and/or information and communication technologies. It wants to establish ‘effective system of national financial and administrative support structures for Horizon 2020’, reduce administrative burdens for the Structural Fund schemes, and set up a ‘complementary system for the funding of projects from the state budget and EU framework programmes’. Major goals for innovation development are set in the national RIS3 document. Business and innovation incubators, technology transfer schemes, innovation voucher and financial engineering schemes (JEREMIE) are main tools for innovation policies.

2.6 Recent evaluations, consultations, foresight exercises

Public bodies and support schemes in research and innovation are subject to regular evaluation in Slovakia. The evaluation culture, however, is rather underdeveloped.

Systemic evaluations are elaborated by the Slovak Government and the Ministry of Education, Science, Research and Sports. Since 2006 the Slovak Government has published eight Annual Reports on R&D. The reports provide a concise summary of the state financial support to R&D

activities and bodies rather than analysis of strengths/weakness of the Slovak R&D system. The latest 2012 R&D report acknowledges that the ‘while Slovak economy grows rapidly, research, development and innovations lag behind the European average’. The report identifies ‘below average financial resources, excessive focus on basic research, relative autarky and, so far, low impact of research on innovation performance of the Slovak economy’ as the major problems of the Slovak R&D&I system. The annual reports on R&D and annual reports issued by the [Research and Development Agency](#) list numbers of projects and volume of assistance provided by the state budget, but do not mention impact evaluation.

Since 2009 the Slovak Government has published annual evaluation reports on the 2007 [Innovation Strategy](#) and the 2008 and [2011 Innovation Policy](#) initiatives⁶. The latest 2012 report acknowledges that the ‘Slovak Government considered negative impacts of the economic and financial crisis and concentrated financial resources mainly on support to job creation and subsidising existing employment’. Financial resources allocated to innovation were lower than envisaged in the State Budget Law. As for the national financial support to innovation *de minimis* scheme supporting industry clusters was the most important initiative (€0.2m). The European resources should provide much higher investments via the [JEREMIE](#) programme (€125.0m) in 2013-2015. The 2012 evaluation report concluded that ‘sectorial structure of the Slovak economy should converge to that by the advanced EU economies’, but ‘enterprises must be more active in applied research and innovations’. Support to cluster policies may generate an environment conducive to development of research and innovation.

The Structural Funds schemes are evaluated on continuous and periodical basis. The monitoring reports (related to individual calls) and the annual reports for particular operational programmes tend to be rather formal. They concentrate on stating numbers of applicants, and volume of support required and awarded. Impact assessment procedures are underdeveloped, because of lack of experts and techniques. Preparation of the RIS3 document provided a unique opportunity for complex evaluation of the Structural Fund schemes in period 2007-2013. Detailed data are contained in Annex 2 of the RIS3 document. Major lessons learnt are discussed in the chapter 2.3 of the document and relate to the key operational programmes (‘Research and Development’, ‘Education’, ‘Competitiveness and Economic Growth’ and ‘Bratislava Region’). The evaluation report states many positive outcomes of the Structural Fund schemes, e.g. in terms of numbers of infrastructure and R&D co-operation projects, R&D Centres, Competence Centres patents, scientific jobs created, and papers published in reviewed journals. Implementation of the schemes was a subject to many difficulties. The RIS3 document explicitly mentions excessive bureaucracy, inappropriate timing, management procedures, inadequate funding rules, ambiguous settings of procurement system, and problematic evaluation arrangements, which focused more on the quantitative indicators than on quality assessment.

The main evaluation body for Universities is the Accreditation Commission of the Slovak Ministry of Education, Science, Research and Sports. It evaluated 27 higher education institutions (HEIs) in 2009-2010. The Accreditation Commission classified HEIs in three categories: (i) Universities, (ii) Higher Education Institutions and (iii) Professional Higher Education Institutions. The Ministry of Education, Science, Research and Sports deemed there are too many HEIs. It rejected proposals for establishing several new private HEIs in 2010, but

⁶ Five evaluation reports were approved by the Slovak Government and published on the Government Office webpage: the 2008 Evaluation Report (Government Resolution no. 810/2009 of 18 November 2009); the 2009 Evaluation Report (Government Resolution no. 212/2010 of 9 June 2010), the 2010 Evaluation Report (Government Resolution no. 51/2011 of 22 June 2011), the 2011 Evaluation Report (Government Resolution no. 455/2012 of 12 September 2012) and the 2012 Evaluation Report (Government Resolution no. 15911/2013 of 16 October 2013).

it approved one in 2011 and one in 2012. The new round of the accreditations starts in 2014. The Accreditation Commission approved new, more stringent rules on 15 April 2013. The rules put more emphasis on research excellence in terms of scientific papers published/cited in journals listed in the international scientific databases (WOS, SCOPUS), research monographs published with high-quality publishers and international patents. Public system of higher education, unfortunately, is heavily underfunded and results of evaluation have little impact on improvements in performance of the HEIs.

The [Slovak Academy of Sciences](#) (SAS) evaluates its institutes since 1992. The last round was concluded in 2012. The accreditation commission appointed nine panels of experts to evaluate particular institutes by scientific fields. About one third of the panel members were foreign experts. Top research teams in the SAS were also evaluated by the Academic Ranking and Rating Agency, an independent evaluator body. The evaluation had limited outcomes. The overall financial support to the SAS from the state budget did not change in nominal and decreased in real times in last three years. There is limited impact of evaluation results on the support to particular institutes of the SAS. The overall 2013 wage budget for the SAS, for example, is fixed and must reflect worker entitlements related to qualification and length of service. The SAS may re-distribute only 5% of total wage budget based on the accreditation result.

Establishing international evaluation standards is no easy task in Slovakia. System of research and higher education is heavily underfunded and it is difficult to find good quality foreign evaluators. The grant agencies and accreditation commissions mostly engage experts from the Czech Republic (for reason of language and cultural proximity) or Slovak citizens employed with foreign higher education and research institutions. Slovak research and higher education system would no doubt benefit from engagement of truly foreign and independent peers.

2.7 Regional and/or National Research and Innovation Strategies on Smart Specialisation (RIS3)

The Slovak Republic made significant progress in preparation of the national RIS3 document. In March 2013 the MESRS published initial draft of the ‘Research and Innovation Strategy for Smart Specialisation of the Slovak Republic’ (RIS3). The initial draft, as well as the 1.0 draft (20 May 2013), and the 1.4 draft (9 August 2013) were improved by comments by the expert teams from the DG Research and Innovation, and DG for Regional and Urban Policy. The Slovak Government Council for Science, Technology and Innovation (SGCSTI) discussed the 2.0 draft of the RIS3 document on 24 September 2013. The Slovak Government passed the final version of the [RIS3 document](#) via the Government Resolution no. 665/2013 on 13 November 2013⁷. The document identifies four key areas of economic specialisation: (1) Automotive and mechanical engineering industries; (2) Consumer electronics and electrical equipment; (3) Information and communication technologies and services, and (4) Production and processing of iron and steel. The document also lists ‘prospective areas of specialisation’, such as (a) automation, robotics and digital technology; (b) processing and increasing the value of light metals and their alloys; (c) production and processing of plastics; (d) creative industry, and (e) increasing the value of domestic raw material base.

Mode of participation of the business associations in the RIS3 preparation was related to some institutional legacies, e.g. long tradition of the top-down decision-making and strong position of central government in Slovakia. The central government (represented by the MESRS) took lead in

⁷ The 2.0 draft version contained detailed indicative financial allocations for particular policy measures. The government approved final version of the RIS3 document with no financial allocations.

the strategy drafting. Slovak businesses initially were involved in the Strategy preparation indirectly, via participation in the six Working Groups on the thematic priority areas. The Working Groups were established by the MESRS in autumn 2012 and included both excellent scientists and representatives of the industry unions in the respective areas. The MESRS and the Ministry of Economy acknowledged importance of comments made by the DG Regio and DG RTD experts on involvement of some key stakeholders. The Slovak Government established the Working Group on the Smart Specialisation Strategy in March 2013. The Working Group included representatives of the MESRS, Ministry of Economy, Ministry of Health, Ministry of Agriculture and Regional Development, Ministry of Foreign and European Affairs, Prime Minister Office, SAS, Slovak Technology University in Bratislava, SIEA, representatives of the entrepreneurs and industry associations, and representatives of research organisation associations. The draft 2.0 of the document reflects opinions and interests of all the above mentioned stakeholders. There is a reasonable description of the prioritisation process in the document – although the involvement of private R&D performers was limited in the process that is a clear reflection of the exceptionally low levels of BERD.

Evaluation report of the DG Research and Innovation pointed out that ‘there is a clear link made between statistical and policy analysis, with a mix of quantitative and qualitative data used to make clearly a number of parts that suggest that the SWOT is largely reasonable’.

A lack of co-operation and information sharing between the respective Ministries appears to have been at least one of the reasons for a relative underperformance of the R&D and Innovation Strategies in the previous programming period. The overall governance problem can be characterised as a lack of co-ordination between a small number of separate, strong Ministries used to operating in their own rigid hierarchies. The new governance system needs urgently to find a way to address problems of co-ordination of R&D&I policies, not just addressing the most superficial problems, and co-ordinate not just policy actors, but also those delivering research activities, and align them around common goals, priorities, strategies, approaches and timescale. The RIS3 document presents far-reaching plans in following areas:

- Merging incumbent eight R&D&I government agencies into two: the Science Agency and the Technology Agency. The Science Agency will be a part of the MESRS, while the Technology Agency will be a part of the Ministry of Economy. Both agencies, however, are supposed to be ‘advised’ by the SGCSTI.
- Changing shares of support to basic and applied research from current ratio of 2:1 to 1:2 by 2020.
- Introducing ‘mandatory indicator of the state support to R&D as percentage of GDP in the State Budget Law’.
- Re-organising HEIs and transforming the Slovak Academy of Sciences.

Proposals for particular policy measures identify target groups, responsible policy bodies, measurable objectives, time plans and identification of finance resources. Plans for reform of the R&D&I governance system are confirmed and described in Chapter 6 of the Strategy document on Strategic Goals. Target 2 ‘Increasing contribution of research to economic growth via global excellence and local relevance’ contains Measure 2.1 ‘Fostering excellent research’. The measure lists legislative initiatives for transformation of the key research performers, such as HEIs and the SAS.

The MESRS presented draft of the Action Plan for the RIS3 document on 17 March 2014. The draft concentrated on legislative measures aimed at reform of funding agencies, transformation of the SAS and introduction of tax credit for business R&D. These measures should stimulate business R&D expenditure and applied research, and be ready by January 2015. The Action Plan also suggested set of criteria for allocating financial support to seven thematic priorities. The seven priorities include (a) material research and nano-technologies; (b) information and

communication technologies; (c) biomedicine and biotechnologies; (d) industrial technologies; (e) sustainable energy; (f) agriculture and environment, and (g) societal problems and challenges. The criteria include (i) economic importance; (ii) critical mass in terms of numbers of researchers; (iii) publication activity; (iv) citations and (v) participation in the FP7 projects. The draft of Action Plan did not include the ESFRI roadmap. Draft of the roadmap should be submitted later in 2014 (source: personal communication with the MESRS staff).

There are no self-governing regions on the NUTS II level in Slovakia. The eight regional governments (NUTS III level) account for limited financial powers and have no research policies and/or governance structures for research and innovation. No explicit regional R&D&I programmes and policy initiatives have been developed so far in Slovakia (except for the Bratislava Region). The RIS3 document explicitly recognises failure of some key regional policies (e.g. Regional Innovation Centres). The document does not contain any regional characteristics, priorities and/or plans for building regional innovation governance structures.

The initial drafts of the Slovak Partnership Agreement and the Operational Programme Research and Innovation were not aligned well with the RIS3 document requirements. The Slovak Government acknowledged recommendation by the European Commission and prepared new drafts of the respective documents. The drafts should be ready in 2014. The Slovak Government also plans to prepare the Action Plan for the RIS3 in 2014.

Chapter 5 of the RIS3 document describes basic mechanisms for monitoring and evaluation. The RIS3 should be implemented via 'annual plans with a three year perspective (1+3)'. The annual plans will 'flexibly react to the progress in accomplishing the RIS3 objectives and priorities by the method of rolling forecasts and also flexibly react to changes resulting from the implementation of projects and changes in the external environment'. The Standing Committee of SGCSTI should provide for regular reviews and monitoring activities. Chapter 6 of the RIS3 document lists a set of R&D&I policy measures and sets indicators for monitoring industry-academia co-operation, and commercialisation of research. The RIS3 document, however, misses detailed explanation of impact indicators. Given substantial financial assistance provided in the programming period 2014-2020 the RIS3 document does not contain any specific measures in terms of outputs (i.e. numbers of projects/enterprises supported) and impacts (increases in number of jobs for highly skilled, increases in total value added, changes in industry structure of the Slovak economy, etc.). RIS3 document lists some result indicators (mostly taken from the Innovation Union Scoreboard), but does not provide for any numerical specifications.

2.8 Policy developments related to Council Country Specific Recommendations

The 2013 Council Recommendation Slovakia's 2013 national reform programme and delivering a Council opinion on Slovakia's stability programme for 2012-2016⁸ noted that current mode of education 'favours quantity over quality and the share of funding allocated to teaching activities (teachers, material, and equipment) is low. Improving the quality of higher education and the co-operation between businesses and education institutions would also help developing a well – functioning knowledge triangle, greater effectiveness and attractiveness of investment in R&D, and enhancing the innovation capacity of the Slovak economy. The Council recommended fostering 'effective knowledge transfer by promoting co-operation between academia, research and the business sector'.

⁸http://ec.europa.eu/europe2020/making-it-happen/country-specific-recommendations/index_en.htm

The Slovak Government addressed these issues in the [2013 National Reform Programme](#) (NRP). The problem of low-quality mass education will be addressed via measures discouraging 'tertiary schools from retaining non-performing students, with a stronger emphasis placed on the quality of their performance'. New round of the HEI accreditation should 'examine the real performance and quality of guaranteeing teams instead of their academic titles'. The members of the guaranteeing team must be 'internationally recognised scholars'. Research excellence 'will be examined through benchmarking publication and citation criteria against international standards applicable in the particular field of study'. The government intends change accreditation of study programmes into accreditation of fields of study. The change should increase flexibility for opening new study programmes within a particular accredited field of study. As for the improvements in the research and innovation system, the 2013 NRP was less specific. The Government declared its plans for providing 'stable system environment to encourage the transfer of knowledge to practice', and clustering 'excellent applied research or research on particular selected topics' in university scientific parks, but stated no financial and/or legislative commitments. Support to innovation will be provided via the 'Cluster Organisation Scheme', 'Innovation Voucher Scheme' and the [JEREMIE](#) holding fund. Financial commitments are stated only for the JEREMIE measures (€125m) financed from the Structural Funds. No commitments related to the national financial resources were stated in the 2013 NRP.

3. PERFORMANCE OF THE NATIONAL RESEARCH AND INNOVATION SYSTEM

3.1 National Research and Innovation policy

The Innovation Union Scoreboard (IUS) data indicates that Slovakia has made a modest progress towards developing knowledge-based economy since 2007. The absolute value of the Summary Innovation Index (SII) changed little in period 2007-2012 (0.295 versus 0.337). The gap against the EU-27 SII value (0.517 versus 0.544) remained about the same. Slovakia's position against its main competitors in the region (the Czech Republic, Hungary and Poland) somewhat improved in the above-mentioned period (Figure 3). Analysis of the SII components indicates that Slovakia matches/surpasses European standard in few indicators (Table 2). Some of these indicators (new doctoral students and/or youth with upper secondary level of education) point to mass rather than high-quality education. The shares of medium- and high tech exports in total exports refer to Slovakia's dependency on two key industries (automotive and consumer electronic) introduced by the multinational companies, rather than country's own effort to develop high-value added production.

Low inputs (in terms of public and business R&D spending) corresponded with low outputs, as measured by high quality scientific publications, exports of the knowledge-intensive business services, and numbers of the SMEs introducing process, product and/or marketing innovations. Structure of the IUS indicator set, however, only partly described relation between inputs on outputs in the Slovakia's economy. Slovak economy accounted for high stock of the foreign direct investment and was dominated by branches of the multinational companies (MNCs), in car-making and consumer electronics in particular. Slovakia significantly benefited from transfer of the high technologies and top managerial practices by the MNCs. The labour productivity (per hour worked, in purchasing power parity) increased from 46.9% of the EU average to 73.8% in period 1995-2013. The IUS indicators mostly concentrate on the SMEs and are not able to mirror process of the technology diffusion by the MNCs and increases in labour productivity in small and open economies. Some limitations of the IUS indicators also apply to R&I outputs. Slovakia accounts for very poor performance in intellectual assets (PCT patent applications, and licence & patent revenues). This performance relates both to the low BERD and the absence of headquarters by the multinational companies. Some global firms with high patent intensity were located in the Slovak Republic (Samsung, Volkswagen, Hyundai-Kia), but filled in their patents elsewhere.

Table 2

HUMAN RESOURCES	
New doctorate graduates (ISCED 6) per 1000 population aged 25-34	3.1 (206.7% EU27 average)
Percentage population aged 25-64 having completed tertiary education	23.4 (67.6% EU27 average)
Open, excellent and attractive research systems	
International scientific co-publications per million population	379.4 (126.3% EU27 average)
Scientific publications among the top 10% most cited publications worldwide as % of total scientific publications of the country	3.3 (30.0% EU27 average)
Finance and support	
R&D expenditure in the public sector as % of GDP	0.48 (63.4% EU27 average)
Public Funding for innovation (innovation vouchers, venture/seed capital, access to finance granted by the public sector to innovative companies)	n.a.
FIRM ACTIVITIES	
R&D expenditure in the business sector as % of GDP	0.34 (26.0% EU27 average)
Venture capital and seed capital as % of GDP	n.a.
Linkages & entrepreneurship	
Public-private co-publications per million population	15.7 (29.6% EU27 average)
Intellectual assets	
PCT patents applications per billion GDP (in PPS€)	0.4 (9.5% EU27 average)
PCT patents applications in societal challenges per billion GDP (in PPS€) (climate change mitigation; health)	0.1 (10.3% EU27 average)
OUTPUTS	
Economic effects	
Medium & high-tech product export as % total product export	8.2 (EU27 average n.a.)
Knowledge-intensive services exports as % total service exports	19.6 (43.5% EU27 average)
License and patent revenues from abroad as % of GDP	0.0 (0.7% EU27 average)

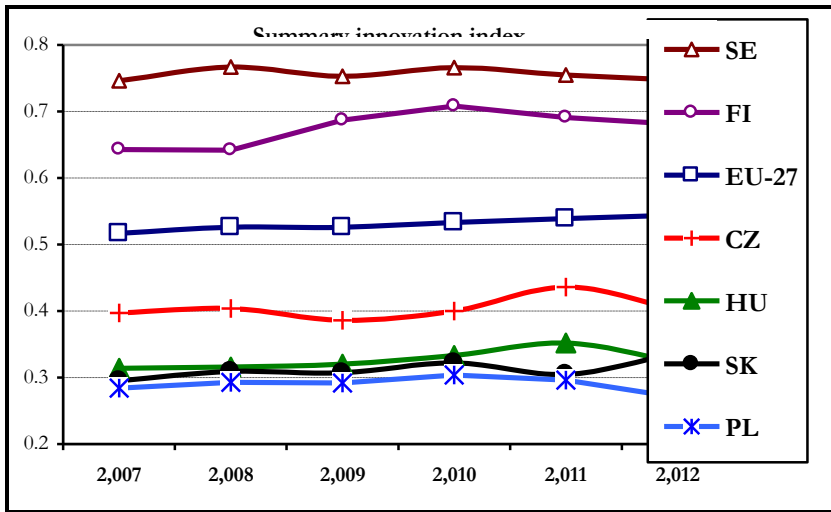


Figure 3: Development of the Summary Innovation Index for the Slovak Republic and its peer countries in 2007-2012. Source: Innovation Union Scoreboard

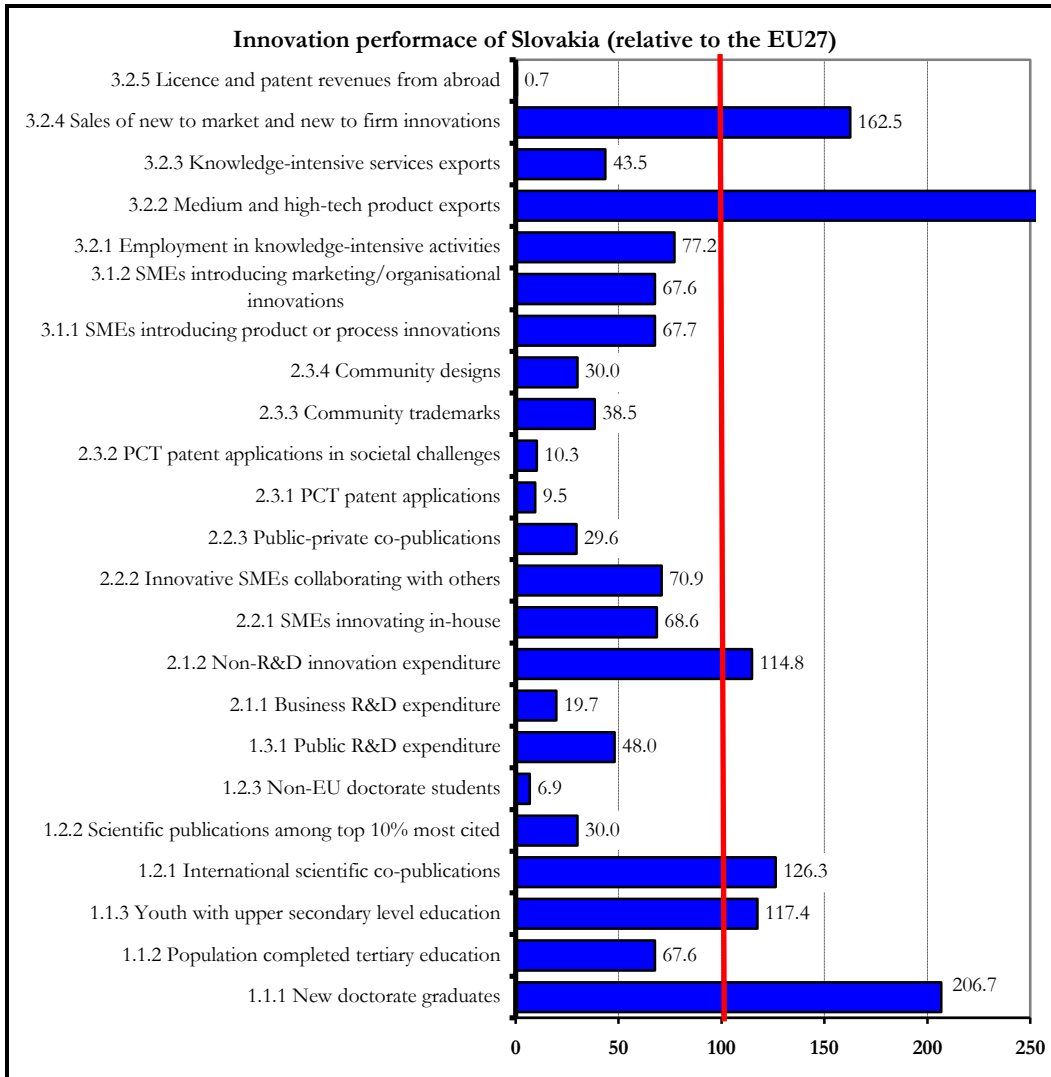


Figure 4: Components of the Summary Innovation Index for the Slovak Republic in 2012. The EU27 = 100. Source: Innovation Union Scoreboard

3.2 Structural challenges of the national R&I system

The key challenges in the national innovation system have been continuing for many years and identified in the key government documents on innovation policies (the [2007 Innovation Strategy](#), and the [2008](#) and [2011 Innovation Policy](#) and research policies (the 2007 [Long-term Objective of the State S&T Policy up to 2015](#))⁹:

- **Challenge 1: Weak R&D system disables co-operation between academia and industry sectors.** A common denominator for poor research and innovation performance was near defunct research system. The share of gross expenditure on research and development (GERD) in the gross domestic product (GDP) fell from 3.88% in 1989 to 0.82% in 2012¹⁰. Slovak R&D spending was one of the lowest in Europe (EU27 average = 2.07% in 2012), and also very low against the reference group countries (CZ+IT+HU+SI+SK = 1.27%)¹¹. Fall in business spending on R&D (BERD) was a striking feature in comparison with the reference group countries in 1990s and 2000s. The share of business expenditure on research and development (BERD) in GDP was 0.34% in Slovakia while 1.31% in 2012 in the EU27 (see chapter 2.2 for more details). Slovakia accounted for a relatively educated labour force, but failed to move to an R&D-intensive employment structure. The country was unable to shift from a blue collar structure to structure of employment based on tertiary education and high numbers of R&D workers. Low numbers of R&D workers also reflected limited interest by Slovak companies in R&D intensive production (see challenge 4).

- **Challenge 2: Underdeveloped system of innovation governance.** The history of modern innovation policy in Slovakia is quite short. Innovation was not considered a priority till 2005 when the Competitiveness Strategy (the Lisbon Strategy for Slovakia) was passed. The [2007 Innovation Strategy](#) referred to an 'absence of strategic policies supporting innovations, low numbers and a fragmented system of explicit innovation policy measures, and poor innovation management, coordination and monitoring'. The Slovak Innovation and Energy Agency was created as late as 2007. Research bodies and policies used to be under aegis of the MESRS, while most innovation-related initiatives and agencies are managed by the ME. Co-ordination of the research and innovation policies was poor. Slovakia had no national innovation plan and/or functional national innovation council till April 2013. The regional systems of research and innovation governance also were missing by early 2014. The regional governments account for very limited financial resources and have no legislative powers in field of research and innovation. The flagship initiative of the 2007 Innovation Strategy, the 'Regional Innovation Centres' (RICs), proved too complex to implement and was cancelled by the Slovak Government in 2011¹².

- **Challenge 3: Dual economy.** Dual economy probably is the most important barrier for developing strong private R&D sector and promoting innovations in Slovakia. Slovak economy is largely foreign-owned, and branches of the multinational companies (MNCs) provide for significant part of Slovak industrial output and exports (Samsung, Volkswagen, Siemens, Hyundai-Kia, Peugeot-Citroen, US Steel). No MNC had its headquarters in Slovakia. The

⁹ For comprehensive list and details of key policy documents on research and innovations see the 2010 Mini Country Report for the Slovak Republic.

¹⁰ The 2009 share of GERD in GDP was 0.48%. Increase in intensity of R&D spending to 0.63% GDP in 2010, 0.68% GDP 2011 and 0.82% in 2012 reflects higher spending by the Operational Programmes 'Research and Development' and 'Competitiveness and Economic Growth' in 2010. Source: Eurostat.

¹¹ For country grouping see the [Innovation Union Competitiveness \(IUC\) report](#).

¹² For details of failure of the RIC scheme see the 2011 [Mini Country Report for Slovak Republic](#) under Specific Contract for the Integration of INNO Policy TrendChart with ERAWATCH (2011-2012)

MNC were attracted by low cost of inputs (labour in particular), geographical location of Slovakia and favourable tax conditions. The MNCs did research in their headquarters and had limited interest in shifting their applied/industrial research to Slovak Universities and research institutes. The 2013 EU Industrial R&D Investment Scoreboard contains no Slovak company. Lack of strong Slovak-based MNC (like Nokia or Volkswagen) significantly affected private spending on R&D. The R&D investment by the Volkswagen group (€9.52b), for example, was 16 times higher than total Slovak GERD and 40 times higher than Slovak BERD in 2012 (source: the 2013 EU Industrial R&D Investment Scoreboard). Some 150 thousands of Slovak small and medium sized enterprises (SMEs) compete with low costs of inputs. A rather excessive focus on SMEs has been a potential weakness of Slovak innovation policies. Branches of MNCs accounted for the bulk of high and medium-tech exports¹³ and high rates of technology transfer and diffusion, but were not targeted by any innovation policy measures in Slovakia.

▪ **Challenge 4: Low shares of domestic innovative enterprises limit competitiveness of the country.** Dual structure of national economy is reflected in low intensity of BERD, low shares of SMEs innovating in-house and low numbers of patents, industrial designs and other commercial results of research and innovations. Most Slovak SMEs considered investment in research and innovation risky and with uncertain result, and bet on low costs of labour and good price/quality ratio. Average monthly labour costs in industry, construction and services were €1,207 in Slovakia, but €4,009 in Austria, €4,084 in Germany, €4,543 in the Netherlands and €4,552 in Belgium in 2011 (source: Eurostat). Some 21.8% Slovak enterprises innovated in-house, while 39.8% of enterprises were engaged into such innovation activities in 36.3% in Austria, 45.2% in Germany, 39.1% in the Netherlands and 31.8% in Belgium in 2010 (source: the 2013 Innovation Union Scoreboard). Lack of strong domestic R&D-intensive companies may be partly alleviated by introduction of demand-side innovation and R&D policies. Public procurement of research and innovation, however, is scarce in Slovakia. The former State Research and Development orders were abolished in 2006. Unfortunately, none Slovak innovation and/or research policy document mentions public procurement of innovative technologies¹⁴.

▪ **Challenge 5: Inadequate national innovation funding.** The national innovation funding earmarked by the [2011 Innovation Policy](#) for the period 2011-2013 (€5.05m) is a fraction of the European one (€90.55m). The 2011 Innovation Policy acknowledged ‘disproportional reliance by innovation policies on the European and international financial assistance’ and called for increased national funding for innovation. It however is unclear from where the national support to innovation should come from. The key support measures (no. 9 ‘The national motivation project for increasing efficiency of innovations in Slovakia’, no. 10 ‘[Supporting innovative activities in enterprises](#)’ and no. 11 the ‘[JEREMIE](#)’) are assisted by the Operational Programme Competitiveness and Economic Growth. The national innovation funding also accounts for limited portfolio of funding forms and lack of clear thematic focus. Slovak businesses would benefit from higher national funding, as the national schemes used to account for much lower administrative and higher flexibility as schemes supported by the Structural Funds.

¹³ Two industries (manufacture of car and car components, and consumer electronics) accounted for 42.3% of total Slovak exports of goods in 2013.

¹⁴ The State Research and Development Orders (SRDO) were one-off contracts with research institutions for innovative and R&D solutions of some ad-hoc issues (e.g. construction of water works). The SRDO programme was affected by the budget cuts. R&D projects commissioned by the Ministry of Defence were closest thing to public procurement of innovative technologies. None of these projects accounted for commercial success. For more details see the 2011 [MiniCountry Report for the Slovak Republic](#).

3.3 Meeting structural challenges

The **Challenge 1** is addressed by a number of schemes under the 2007-2013 innovation policy mix. Majority of the policy measures target building R&D infrastructure, building linkages between the academia and industry sectors and support to technology transfer. They are supported from the Operational Programmes 'Research and Development' ([OPRD](#)) and 'Competitiveness and Economic Growth' (OPCEG) (see chapter 4.2 for more details). Most projects supported from these measures end in 2015. No comprehensive evaluation has been provided so far. The measures may help founding sound R&D system, if the policy mix is implemented in consistent way. The OPRD and OPCEG policy measures are implemented by different ministries (MESRS and Ministry of Economy) and there is little evidence on synergies between the programmes.

The **Challenge 2** accounted for significant progress in in 2013. The top body for the R&I governance, the Slovak Government Council for Science, Technology and Innovation (SGCSTI) finally became functional in April 2013. The SGCSTI was quite active and approved a number of important R&I policy documents, including the RIS3 strategy (see chapter 2.3 for more details). There, however, was no progress in building regional system of innovation governance. The Slovak Government also considered reform of the higher education institutions (HEIs) and public research bodies (PROs). Implementing more efficient and transparent evaluation techniques and reforming some key research performer institutions (RDA and SAS in particular) should push HEIs and PROs from quantitative targets towards to qualitative ones, and promote efficient use of public spending on education and research.

The **Challenge 3** on dual economy was for the first time recognised in the RIS3 document. The strategy proposed a number of policy measures aimed at increasing embeddedness and related variety of the key Slovak industries (linking Slovak SMEs with branches of the MNCs via clusters, innovation partnerships, joint research centres, applied research grants, etc.). The final goal of these measures is integration of the Slovak firms into the global value chains and increasing levels of value added in products made in Slovakia. Policy measures addressing challenge 3 will be developed and implemented in programming period 2014-2020.

The **Challenge 4** on low innovativeness by the Slovak SMEs is addressed mainly by the OPCEG policy measures and a very modest national funding (see chapter 4.2 for more details). The OPCEG is implemented by the Slovak Innovation and Energy Agency and invests €968.3m from the ERDF and €170.9m from the Slovak state budget in the period 2007-13. The OPCEG policy measures have high budgets, but ambiguous impacts, with the technology transfer schemes being inexpensive, user friendly and very popular with users¹⁵. In the same time they have the potential for market distortion, corruption and inefficient allocation of resources. The potential amount of new jobs supported by the 456 OPCEG projects is estimated to be 1600 in the technology transfer and industrial park schemes, a rather low figure given the total support €395m by September 2013¹⁶.

The **Challenge 5** on inadequate national funding of research and innovation remains unaddressed by the Slovak R&I policies. The Slovak Government has adopted no realistic

¹⁵ The OPCEG 1.1 calls on technology transfers were oversubscribed by potential users. Numbers of applicants and support demanded were twice as high as final numbers of beneficiaries and actual allocations.

¹⁶ Source: Chapter 2.3.3 of the [Slovak RIS3 document](#).

commitments on increasing support to research and innovation from public resources. The first versions of the RIS3 document, for example, originally contained detailed budgets for particular policy measures, including details on national support. The final version of the document, however, was passed without any financial specifications by the Government Resolution no. 665/2013 on 13 November 2013.

Table 3

Challenges	/Policy measures/actions addressing the challenge ¹⁷	Assessment in terms of appropriateness, efficiency and effectiveness
1. Weak R&D system disables co-operation between academia and industry sectors.	Slovak government used means provided by the Structural Funds and applied policy measures targeting building R&D infrastructure, building linkages between the academia and industry sectors and support to technology transfer.	(+) High numbers of the research infrastructure projects (67 Centres of Excellence, 93 R&D Centres, 8 Competence Centres, 11 Science Parks). (+) R&D Centres and national project on R&D information infrastructure perform well. (-) Centres of Excellence are too many and face problem of sustainability. Science Parks are under construction. It is too early to assess their efficiency.
2. Underdeveloped system of innovation governance.	The Slovak Government Council for Science, Technology and Innovation (SGCSTI) started its operation in April 2013. After 2-year hiatus, Slovakia had top body for RDI governance.	(+) The SGCSTI is chaired by the Prime Minister and involves all major stakeholders of the Slovak national system of innovation. The council was very active and helped to draft four versions of the RIS3 document in 2013. (-) Regional innovation governance bodies were missing in 2013 in Slovakia.
3. Dual economy.	The RIS3 document proposes policy measures aimed at (i) increasing embeddedness by the MNCs in the Slovakia's economy; (ii) improving integration of the Slovak firms into the global value chains; and (iii) support to clusters and joint research centres by public and private sectors.	Too early to assess.
4. Low shares of domestic innovative enterprises limit competitiveness of the country.	Two policy measures were financed from the Operational Programme Competitiveness and Economic Growth (OPCEG) and spent about €395m by September 2013.	The OPCEG policy measures have impressive budgets, but rather ambiguous results. (+) The technology transfer schemes, for example, are inexpensive, simply-to-implement and very popular with users. They helped create jobs and increase turnovers and exports. (+) In the same time the technology transfer schemes have potential for market distortion, corruption and inefficient allocation of resources
5. Inadequate national innovation funding.	Innovation policy measures almost completely rely on assistance provided by the Operational Programme Competitiveness and Economic Growth. National innovation spending is 20 times lower than those supported by the OPCEG.	National funding for innovation is completely inappropriate.

¹⁷ Changes in the legislation and other initiatives not necessarily related with funding are also included.

4. NATIONAL PROGRESS IN INNOVATION UNION KEY POLICY ACTIONS

4.1 Strengthening the knowledge base and reducing fragmentation

4.1.1 Promoting excellence in education and skills development

Slovakia had 25,069 researchers in headcounts, some 0.45% of total population and 1.2% of total employment in 2012. Numbers of researchers fell rapidly from 34,685 in 1989 to 13,358 in 1993. After long period of stagnation in 1990s and early 2000s numbers of researchers started to rise in 2004 (Figure 2). Employment in research benefited from higher R&D investments made by Slovak Government and European institutions over the last ten years.

There is insufficient data on inward/outward flows of researchers in Slovakia. It seems that a brain drain is a serious problem. The government programme statements use to contain intentions on combating brain drain. The [Long-term Objective of the State S&T Policy up to 2015](#) (key Slovak policy document on R&D), the [Operational Programme Research and Development](#) (major source of finance for Slovak R&D system in 2007-2013) and the human resource programmes by the [Research and Development Agency](#) contain priorities on encouraging return migration by Slovak scientists. Low wages and high unemployment rate generally encourage emigration and discourage immigration by highly skilled in Slovakia. The Eurostat data indicate that foreign nationals accounted for some 2.1% of researchers (in head counts) in Slovak government and HEI sectors in 2003 and 2.1% in 2011. Shares of foreign nationals in Slovak public research institutions changed little in period 2003-2011¹⁸. It indicates quite low level of immigration by highly skilled professionals to Slovakia.

The Slovak Academic and Information Agency manages Slovak version of the [EURAXESS](#) webpage since 2004. The EURAXESS services include information on potential jobs for Slovak researchers abroad. The EURAXESS also published job vacancies outside Slovakia in 2012. Information is important for Slovak researchers seeking better work conditions abroad. For foreign nationals wishing to work in Slovakia the EURAXESS published practical information on entry conditions and legal stay, health insurance, social security, taxation, recognition of diplomas and qualifications, and daily life.

The 404/2011 Law on Residence by Aliens (valid since January 2012) implemented the 2009/50/EC Directive of 25 May 2009 ('The Blue Card Directive'), and the 2009/52/EC Directive of 18 June 2009 (on sanctioning illegal employment by the third country nationals). The law introduced special kind of work permit ('the research and development permit') and enabled for easier access by highly skilled third-country nationals to Slovak labour market. Four Slovak Universities, two institutes of the Slovak Academy of Sciences and the International Laser Centre applied for R&D work permits in 2012. The Slovak Government passed Resolution no. 574 of 31 August 2011 on 'Migration Policy of the Slovak Republic Perspectives until the year

¹⁸ The Eurostat provides no data for private sector employment of foreign nationals.

2020'. The document is a comprehensive strategy for migration management in Slovakia and contains strategic objectives in different areas such as legal migration, integration, asylum, etc. There is special chapter on emigration of qualifies labour force (p. 11) and legal economic immigration of highly skilled people (p.7). The 'Action Plan for Migration Policy of the Slovak Republic for years 2012-2013' also contains important information on highly skilled migration management in the Slovak Republic.

The HEI teachers and research workers are considered civil servants. Civil servant status determines salary levels for all senior academic and administrative staff. Salaries of all academic staff members are fixed or negotiated nationally due to their civil or public servant status, although the rector or dean may increase prescribed salary levels by as much as 100% (which is very rare). Basic salaries are computed via formulas based on academic degree and length of service.

Slovak Universities account for medium-low ranking in World lists of top HEIs and research institutions. There was only one Slovak HEI in the 2013 SCIMAGO ranking (Comenius University in Bratislava, ranked no. 789).

The Slovak Government intends to increase quality of tertiary education via some far-reaching reforms. The 2013 National Reform Programme states that some 8,000 accredited study programmes in higher education should be transformed to some 364 fields of study. This would provide HEIs with higher flexibility for opening new study programmes within an accredited field of study. Members of the team committees guaranteeing a study programme should be 'internationally recognised scholars' and their expertise will be examined 'through benchmarking publication and citation criteria against international standards applicable in the particular field of study'. The Government also insists on 'switching to a standard global model' and abolishing titles of 'professor' and 'assistant professor', because 'given the low criteria for their awards, these titles have no adequate value'.

Merit-based recruitment of young researchers was distorted by inefficient system of PhD scholarships. Numbers of the PhD students increased from 3875 in academic year 1998/1989 to 10,006 in 2012/2013 (Source: [Institute of Information and Prognoses of Education](#)). PhD studies become an alternative to unemployment for some tertiary graduates. The new system of PhD scholarships enables for preferring quality over quantity of the PhD students. The allocation method for subsidies for PhD scholarships changed. The MESRS commits financial resources for scholarships for existing full-time PhD students. Financial resources for new PhD students are not committed and it is up to individual HEI to decide whether they will be spent on PhD scholarships or otherwise.

The Slovak Republic participated in the ERA-SGHRM Working Group on "Human Resources issues, including the HRS4R". Two national research organisations signed the Charter for Researchers in Slovakia: the Rectors of the Slovak Higher Education Institutions and the Slovak Academy of Sciences. These two bodies represent about 80% of the total researchers in Slovakia. Other HEIs and research institutions do not report compliance with the Charter and the Code.

4.1.2 Research Infrastructures

The Slovak Republic accounts for underdeveloped research infrastructure. It is in interest of Slovakia to build a modern research infrastructure for R&D and promote co-operation under the ESFRI projects. The Slovak Government passed the National Strategic Reference Framework in 2006 and decided that the research and innovation infrastructure would be supported from three

Operational Programmes ('Research and Development', 'Bratislava Region' and 'Competitiveness and Economic Growth'). All three programmes rely on the European Regional Development Fund (ERDF). The [Operational Programme Research and Development](#) (OPRD) accounted for some 10% of Structural Fund outlays in 2007-2013 in Slovakia. The OPRD invests €1209.4m from the ERDF and €213.4m from the Slovak state budget. In some years, OPRD calls allocated 20 times more money than the national support schemes (the [Research and Development Agency](#) projects). The OPRD projects mainly supported infrastructure building in 67 Centres of Excellence (€231.84m), 93 Research and Development Centres (€190m), 8 Competence Centres (€57.59m), and 11 University Science Parks (€300m). The Operational Programme Competitiveness and Economic Growth (OPCEG) invested €968.3m from the ERDF and €170.9m from the Slovak state budget in period 2007-2013. Bulk of assistance supported purchase of new technologies by Slovak small and medium enterprises (SMEs) in manufacturing industries and applied research projects (about €600m). The [Operational Programme Bratislava Region](#) (OPBR) invested €95.2m from the ERDF and €16.8m from the Slovak state budget in period 2007-2013. The programme *inter alia* supports improving infrastructure for business.

The Slovak Government invested considerable means from the OPRD for building modern infrastructure for access to and preservation of scientific information, knowledge and technology transfer, as well as promotion of digital research services. Two national projects ([National information system supporting research and development in Slovakia](#) and [Infrastructure for research and development - Data centre for research and development](#)) invest some €53.1m in the ICT infrastructure in Slovakia between 2008 and 2014. Two national projects (Transfer of knowledge and technology from research and development into practice and, the National infrastructure supporting technology transfer in Slovakia) invest €235.1m in period 2008-2014. They support science parks, applied research projects, R&D co-operation projects, and technology transfer centres in Slovak HEIs and public research organisations.

All the above-mentioned programmes support building and modernising national R&D and innovation infrastructure. As of today, it is difficult to forecast effects of these programmes on Slovakia's participation in the [European Strategy Forum on Research Infrastructures](#) (ESFRI) initiatives. Progress in building and/or joining European research infrastructures was quite modest so far. In fact, the Slovak Republic had no national research infrastructure roadmap till 2013. The Slovak Government Council for Science, Technology and Innovation discussed white paper on Slovak ESFRI roadmap on 24 September 2013. The roadmap should be ready in 2014.

Slovakia's membership in particular ESFRI schemes has developed on the ad hoc basis. By 2013 Slovakia participated in six ESFRI projects (ESRF Upgrade, European XFEL, ILL 20/20, ESS Survey, FAIR and PRACE) as a full or associate member. By 2015 full or associate membership was planned for the CLARIN, EPOS-ERIC and LIFEWATCH-ERIC projects. Slovak research bodies accounted for 24 participations and obtained support €2.24m in period 2007-2012 in the ESFRI projects. The Slovak Republic also participates in six out of eight largest inter-governmental scientific research organisations that are responsible for infrastructures and laboratories (CERN, EFDA-JET, EMBL, ESA, ESO, ESRF, European XFEL and ILL). The MESRS and its agencies also participate in several ESFRI initiatives (e.g. Council of European Social Science Data Archives, European Social Survey, Research Infrastructures Network for Research in Biodiversity, etc.). Total financial support to participation in 12 international research infrastructures amounted to €10.55m in 2012. Access to Slovak research infrastructure by foreign researchers is provided under bilateral and multilateral schemes in S&T co-operation, but none of the ESFRI facilities and/or large infrastructures were placed in Slovakia.

4.2 Getting good ideas to market

There are several financial schemes supporting innovations in small and medium enterprises (SMEs) in Slovakia:

- The National Agency for Small and Medium Enterprises (NADSME) managed several risk capital schemes and provided funding in the form of equity stakes, loans and guarantees, etc. Actual support to innovation finance by these schemes, was very low and funding non-transparent. The 2009 Review of Risk Capital Schemes in Slovakia by the Ministry of Finance found a relatively low interest in risk capital schemes by innovative businesses. The review, for example, found that the INTEG scheme had provided no support so far and the SISME scheme supported two projects with mere €0.3m. The Fund of Funds venture capital scheme had supported 155 projects with €19.73m since 1994, but there was no evidence to suggest how many of these were very innovation-oriented. The Slovak government identified problems with corruption and mismanagement of national and European resources in the NADSME in 2010. Some managers got into conflict of interest and invested agency's money to their own businesses. The government announced plans for abolishing the agency and/or merging it with other government agencies in 2011. The current government decided to keep the NADSME going and re-starting some of its programmes
- In March 2013 the NADSME re-launched its Micro Loan Programme (MLP). The MLP is based on revolving principle and has total capital of €6.5m. The MLP operates the Information Technology Fund (ITF, €4.2m). The ITF provides microloans (up to €50,000) to 'young and promising' Slovak entrepreneurs and ICT start-ups. The loan must be paid in four years.
- The Ministry of Economy launched pilot Innovation Voucher Scheme under the 71/20103 law in June 2013. The *de minimis* scheme is funded from the Slovak state budget and allocates €100,000 in 2013.
- The 2012 Report on the State Aid sets that the 190 enterprises benefited from the state aid in R&D projects of €22.16m in 2012, of which 72.3% were subsidies and 27.7% tax reliefs (source: Ministry of Finance, the 2012 State Aid Report).
- The Operational Programme Competitiveness and Economic Growth (OPCEG) has been the single largest source of support to the Slovak SMEs. The OPCEG Measure 1.1 '[Innovation and technology transfers](#)' has allocated about €300m to over 400 SMEs by August 2013. Bulk of assistance supported purchase of new technologies by Slovak SMEs in manufacturing industries. Maximum support per project varied from €0.02m to €6.0m.
- The [JEREMIE](#) initiative provides risk capital for small and medium enterprises. The scheme should have started in 2008, but it was delayed several times for administrative complexity. Total capital allocated to the JEREMIE holding fund is €100m in period 2007-2013 (see table below). The first call under the 'First Loss Portfolio Guarantee' (FLPG) financial instrument was launched in October 2011 and allocated €38m. The second call was launched in January 2012 and allocated €32.8m, of which €3.3m comes from the [Operational Programme Bratislava Region](#) and €29.5m from the [Operational Programme Research & Development \(OPRD\)](#). The FLPG already operated in 2013. Four Slovak banks agreed to use €49.7m from the FLGP and leverage total loan portfolio of €284m¹⁹. The Portfolio Risk Sharing Loan (PRSL) financial instrument was under preparation in 2013. The PRSL instrument provides

¹⁹ The first credits from the FLPG scheme were provided in November 2013. Source: [news webpage](#) of the Slovak Ministry of Economy.

€13.3m and is expected to generate portfolio of €26.6m. The Ministry of Economy negotiated with the European Commission and planned transfer of €25m from unused operational programme schemes to the PRSL. The ministry also prepared draft of the Programme for the Competitiveness of enterprises and SMEs (COSME) for planning period 2014-2020.

Funding schemes supported from the national and European resources are regularly monitored, but no benchmarking against comparable schemes in other countries is available.

Table: Financial resources for the JEREMIE programme

Source	Allocation to holding fund	Risk capital instrument for Bratislava Region	Risk capital instrument for non-Bratislava regions	First Loss Portfolio Guarantee for non-Bratislava regions	Portfolio Risk Sharing for Bratislava regions
OPCEG	€67.0m	x	x	€49.7m	€13.3m
OPRD	€29.5m	€5.6m	€22.1m	x	x
OPBR	€3.5m	€3.3m	x	x	x
Total	€100.0m	€8.9m	€22.1m	€49.7m	€13.3m

Source: Ministry of Economy, the 2012 Evaluation Report on Implementation of the Innovation Strategy.

Notes: OPCEG = Operational Programme Competitiveness and Economic Growth; OPRD = Operational Programme Research and Development; OPBR = Operational Programme Competitiveness Bratislava Region.

4.2.1 Protect and enhance the value of intellectual property and boosting creativity

The 2012 Evaluation Report on Implementation of the Innovation Strategy stated that ‘an effective system of the intellectual property right is one of basic instruments for supporting innovations and the system must be used more consistently’. The Slovak Government established an inter-ministerial commission for combating counterfeiting and piracy of intellectual property. The commission drafted the National Strategy for Combating Counterfeiting and Piracy of Intellectual Property. The Slovak Government passed this strategy via its Resolution no. 14911/2012 of 2 May 2012. The strategy document sets that fighting counterfeiting and piracy of intellectual property currently is under aegis of the Ministry of Finance and its agencies, as well as the Slovak Police, Custom Office and Slovak Trade Inspection. The strategy sets targets in (i) building awareness on impacts by counterfeiting and piracy of intellectual property, (ii) decreasing volume of counterfeiting and piracy of intellectual property, and (iii) collecting reliable and accurate data on counterfeiting and piracy of intellectual property. Policy measures on data collection will be drafted by the Ministry of Finance, Ministry of Interior, Ministry of Justice, Ministry of Culture, Slovak Trade Inspection and the Office of Attorney General. Slovak Industrial Property Office will be responsible for education and awareness-promoting activities. The Slovak Government also will co-operate with the Counterfeit Analysis Centre to improve protection of the intellectual property rights.

4.2.2 Public procurement

In last five years, the public procurement of innovative goods and services concentrated on: (a) the ICT services for e-government and (b) military equipment in Slovakia. In both areas the procurement accounted for rather ambiguous results.

Most e-government initiatives were supported by the EU finance in Slovakia. The Priority 1 'E-government and development of e-services' of the [Operational Programme Information Society](#) (OPIS) allocates €808.13m in period 2007-2013 (of which €697.26m by the ERDF and €110.86m by the Slovak state budget). The Slovak Republic proved unable to tap these resources in proper way. Only some 33.5% of the EU assistance was spent by 31 October 2013 (source: Slovak Ministry of Finance, spending by the Structural Funds). Efficient e-government systems were mentioned in the National Reform Programmes for the Slovak Republic for 2006-2013. They included: electronic signature, central portal for public administration, smooth exchange of electronic data among various departments of public administration, electronic land register (cadastre portal), creating single contact points for business, e-health, and integration of tax, duties and social security systems (UNITAS). The electronic land register (Cadastre) was probably the most successful e-government project. The electronic signature was introduced, but proved difficult to use for most businesses and citizens. The e-Health project was approved via the Slovak Government Resolution No 497/2008 of 16 July 2008, but was not functional by 2013. The UNITAS coped with great technical and managerial difficulties. The software solution part of the project failed in March 2012, just before the general elections. Tax collection rate decreased in the period between April and June 2012 in Slovakia. The failure contributed by the downfall of Government of Ms Radicova (source: [Trends and Challenges in Public Sector](#), Technopolis Group 2012).

The Ministry of Defence has commissioned research and development of several armament systems since late 1990s: (i) the 'Alligator' armoured vehicle was developed in 1997-2010, with estimated costs of €7m; (ii) the 'Zuzana' destroyer tank (self-propelled howitzer) has been developed and produced with costs of €6.52m per one prototype; (iii) the mobile information communication system MOKYS probably is the most expensive defence item developed in Slovakia. The system has been developed since 2005 and costs amounted to €250m by 2013. Slovak media deemed procurement activities of the Ministry of Defence overpriced. As a matter of fact, none of the abovementioned defence systems was sold outside Slovakia (source: The 2011 INNO Policy TrendChart Mini Country Report for the Slovak Republic).

4.3 Working in partnership to address societal challenges

Information on Slovakia's activities in the European Innovation Partnerships (EIPs) is scarce. The Slovak Republic is a member in the EIPs on 'Active and Healthy Ageing', 'Agricultural Productivity and Sustainability', 'Water' and 'Raw Materials'. Most Slovak activities concentrate in the 'Active and Healthy Ageing' partnership. Slovakia, for example, participates in the 'Visually Impaired Seniors Active Learning' initiative, 'Patient Medication Adherence' programmes and the 'Knowing Effects on Healthy Life Years' project. As for the Joint Technology Initiatives, Slovakia joined the ARTEMIS – Joint Undertaking.

Most recent Slovak policies documents ([Fenix](#) and [Minerva 2.0](#) strategies, the RIS3 document) contain references to major societal challenges such as energy/climate change, health, ageing and sustainable development, but do not specify targets and/or budgets related to these issues. Slovakia has been active in the Joint Programme in Neurodegenerative Disease Research (JPND). The JPND launched three calls in 2012. The Ministry of Education, Science, Research and Sport of the Slovak Republic allocated financial support to two calls: (a) Genetic, epigenetic & environmental risk factors call (€0.9m) and (b) the COEB Phase II – Pathfinder call (€0.48m) in March 2013. The research is done by the Centre of Excellence in Brain Research (CEBR). The centre co-ordinates activities of seven institutes from the Slovak Academy of Sciences and the Comenius University.

4.4 Maximising social and territorial cohesion

The RIS3 is the first Slovak S&T policy document explicitly mentioning social cohesion. Chapter 2.6.3 of the document states that ‘social thematic priorities are specified with regard to the most pressing problems of the Slovak society’. The document sets three major social challenges:

- ***Population ageing and quality of life.*** Demographic forecast indicates that Slovak population would be impacted by rapid ageing in the next decades. There is a need to focus on ‘active ageing, health security of aged people including the help in the fields of psychical health, social security, elimination of barriers for handicapped, and friendly self-government’.
- ***Multi-ethnicity, social inclusion and poverty problems.*** Some social and ethnic groups (Roma population in particular) account for high rates of poverty and social exclusion. The RIS3 document states need for ‘long-term sustainable solutions’ of this problem.
- ***Employment of young people.*** Slovak unemployment rate has been one of the highest in the EU since late 1990s. The strategy document points to difficulties by young people looking for their first jobs. The document suggests far-reaching reforms in secondary and higher education. The reforms should increase support for vocational education in secondary schools, and strengthening engineering, science and ICT disciplines in tertiary education. Education ‘should be in consistence with needs of the labour market’ and ‘it is necessary to initiate and co-ordinate information campaigns and programmes aimed at motivating young people to entrepreneurship and raising awareness on the protection of intellectual property at all levels of study’.

Issues of the social cohesion are addressed by two proposed policy measures in the RIS3 document. Measure 3.3 ‘Research and innovation in addressing major societal challenges in Slovakia’ focuses on social inclusion, marginalised groups and youth unemployment. It plans investing €50m in research grants on social enterprises and jobs created in creative and knowledge intensive industries in period 2014-2020. Measure 3.4 ‘Supporting an open and inclusive society’ plans investing €50m to grants and tax incentives for enterprises employing ‘social groups at risk’ and ‘citizens with disabilities’ in the same period.

The Slovak Republic has been characterised by high and growing regional disparities. The per capita GDP (in purchasing power parity) in the Prešov Region (€10,104) (NUTS III level), was 4.3 times lower than per capita GDP in the Bratislava Region (€43,063) in 2010. In 1995 the Bratislava Region’s per capita GDP was only 3.4 times higher than that in the Prešov Region. Vast disparities also are typical for the R&D system. The Bratislava Region accounts for some 12% of total Slovak population but over half of total gross expenditure on R&D and research

staff, and 70% of total scientific outputs in Slovakia. The Slovak Government faced a dilemma when considering issues of R&D development and territorial cohesion. Slovakia accounted for very poor research performance in general and the few examples of research excellence concentrated in the Bratislava Region. The Bratislava Region per capita GDP, however, surpassed 178% per cent of the EU average and the region did not qualify for assistance under Objective 1 in 2011. The Slovak Government decided to channel as much as possible of European assistance to Bratislava Region. It was not considered that channelling €2.3b to regions with extremely poor research systems was a good idea. The RIS3 document states that ‘the Slovak Republic will do its best to co-operate with the European Commission for the maximum application of flexibilities in general legislation in order to use European Structural and Investment Funds, and to use the potential of the Bratislava Region, in which more than 50% of personal and technical capacities in R&D is allocated. The Bratislava Region and its institutions bring prosperity in the form of an increase in competitiveness in less developed Slovak regions. It also saturates the demand for academic education in less developed regions and so forth’.

The abovementioned social challenges and territorial cohesion are listed and discussed more in detail also in the Partnership Agreement document. Policy measures targeting territorial cohesion, social inclusion, quality of education and unemployment should concentrate in operational programmes on human resources and transport infrastructure.

4.5 International Scientific Cooperation

Poor research performance and low wages do not contribute to Slovakia’s attractiveness as a destination for research. Slovakia was unable to attract top talents from other countries and, in fact, coped with brain drain by young and talented people. Nevertheless, Slovakia maintained some long-term bilateral and multilateral research programmes, and Slovak scientists were able to co-operate with some prestigious research centres in the World.

The 2012 Annual Report on R&D and the Ministry of Education, Science, Research and Sports (MESRS 2013) provide information on schemes in S&T co-operation managed by the [Research and Development Agency](#):

- (a) The Slovak Republic was a member or associated member in 24 international organisations in 2013. The most important ones included European Organization for Nuclear Research (CERN), the European X-Ray Laser Project (XFEL) and the Joint Institute for Nuclear Research in Dubna (Russia). Slovakia also was a member in the European Science Foundation and Science Europe. As for the European Space Agency, Slovakia signed co-operation agreement in 2010 and considered membership in 2013. Total cost of 12 multilateral co-operation projects was €10.55m of which membership fees €9.18m and project costs €1.37m in 2012 (2011: €11.16m, €9.90m and €1.26m)²⁰. The 2012 Annual Report on R&D specifies benefits of international co-operation in S&T in terms of (i) scientific outputs (scientific papers, monographs and citations), (ii) contribution to Slovakia’s economic growth (supplies of machinery and equipment by Slovak companies), and (iii) developing human resources (research training, PhD students).

²⁰ Source: The Ministry of Education, Science, Research and Sports (2013): [Informácia o stave medzinárodnej vedecko-technickej spolupráce 2012](#) {*Information on the International Co-operation in Science and Technology in 2012*}.

- (b) The Slovak Republic had 19 valid intergovernmental agreements on co-operation in science and technology (S&T) in 2013. Agreements were signed with government of 11 ERA members (France, Greece, Latvia, Hungary, Poland, Portugal, Austria, Romania, Slovenia, Spain and Italy) and eight non-ERA countries (China, Egypt, India, South Africa, Japan, Russia, Ukraine and the USA). Agreements with Argentina, Kazakhstan and Korea were under negotiation in 2013. The bilateral schemes supported 135 projects (€0.30m) with seven ERA countries (Austria, Bulgaria, Romania, the Czech Republic, France, Portugal and Slovenia) and 15 projects (€0.035m) with Serbia in 2012 (MESRS: the 2012 Annual Report on R&D). Bilateral schemes mostly supported mobility projects, and covered costs of travel, accommodation and subsistence. The mobility schemes, unfortunately, were not aimed at specific joint research agendas.

Limited scale of international co-operation in S&T was reflected in high shares of fixed costs. The membership fees amounted to some 90% of total costs of international co-operation and 10% of total national public funding for R&D (outside Structural Funds). Despite some 'pockets of excellence' in selected programmes (CERN, XFEL), Slovakia was not able to reap all benefits of international co-operation in S&T.

Slovakia accounted for suboptimal performance in in the FP7 projects. The 2012 Annual Report on R&D (MESRS 2013) refers to the ECORDA database and lists data on the Slovakia participation in the FP7 projects in period January 2007 – June 2013. Total of 1990 eligible proposals were submitted in response to FP7 calls for proposals involving 2505 applicants from Slovakia. Slovak applicant success rate of 15.8% was lower than the EU-27 applicant success rate of 22.0%. Some 396 Slovak participants signed 319 grant agreements and benefited from financial contribution €59.24m. The Slovakia's EC financial contribution success rate of 10.3% was quite low. Among the EU-27 in all FP7 signed grant agreements, Slovakia ranked 21st in budget share. Slovakia won only one ERC grant. The Slovak Academy of Sciences (€12.7m, 76 participations), Slovak Technology University in Kosice (€4.2m, 18 participations), and the Ardaco firm (€3.2m, 6 participations) were the most successful Slovak participants in the FP7 calls.

5. NATIONAL PROGRESS TOWARDS REALISATION OF ERA

5.1 More effective national research systems

An open national-level competition is crucial to deriving maximum value from public money invested in research. More effective national research system benefits from allocating funding through open calls for proposals, evaluated by panels of leading independent domestic and non-domestic experts.

The Slovak Republic gradually reforms its system of research and higher education. The government declares its support to peer reviews and participation of foreign experts in panels of evaluators. The 2013 National Reform Programme of the Slovak Republic contains the chapter 4.2.2 on reforms in tertiary education and science. The chapter notes fragmentation and low levels out output of the Slovak research system. The chapter also states commitment to support excellence in science via (i) establishment of science parks, (ii) introduction of ‘clear, predictable and equal for the funding of applied research and development in public organisations’, and (iii) support to Slovakia’s participation in the Horizon 2020 initiatives. As for the HEIs, the Government plans to draft a new concept on development of higher education for the years 2013 – 2020. The concept should *inter alia* cover issues of the ‘quality assurance system, tertiary education funding, information systems in tertiary education and internationalisation as a cross-sectoral issue’. The Government also wants to pursue international standards in accreditation of HEIs and increase importance of ‘benchmarking publication and citation criteria’.

Public HEIs could apply for three types of national research grants provided by the [VEGA](#) Grant Agency, [KEGA](#) Grant Agency and the [Research and Development Agency](#) (RDA) in 2012. The VEGA grants supporting basic research in HEIs and the [Slovak Academy of Sciences](#) (SAS) were considered institutional funding, but allocated on competitive basis. The KEGA grants supported pedagogic innovations in HEIs. The RDA grants funded competitive grants in basic and applied research in all HEIs, SAS and private research bodies. Competitive national funding by the abovementioned agencies provided some 8.6% of the total government allocation to research performed by HEIs in 2012. The government plans increasing share of competitive funding in total government funding for research and higher education

Projects distributed by the VEGA, KEGA and RDA agencies are peer-reviewed and at least one expert should be foreign. International peer review sometimes is difficult to implement in Slovakia. Most HEIs accounted for below-average quality (there were only three Slovak Universities in list of top 1000 World Universities by the [Webometrics](#) by July 2013: the Comenius University in Bratislava no. 765, the Slovak University of Technology no. 1047, and the Technical University of Košice no. 1461). It is difficult to find good quality foreign evaluators. The grant agencies and accreditation commissions mostly engage experts from the Czech Republic (for reason of language and cultural proximity) or Slovak citizens employed with foreign HEIs and research institutions.

5.2 Optimal transnational co-operation and competition

The Slovak Republic accounts for underdeveloped research infrastructure. It is in interest of Slovakia to build a modern research infrastructure for R&D and promote co-operation under the ESFRI projects.

The [Research and Development Agency](#) (RDA) managed bilateral exchange and multilateral co-operation schemes in science and technology (see chapter 4.5 for more details). The mobility schemes covered costs of travel, accommodation and subsistence. There were 12 multilateral schemes supported joint research agendas both with the ERA countries and outside the ERA. The most important agreements outside the ERA referred to Slovakia's participation in the Joint Institute for Nuclear Research in Dubna (Russia).

National research programmes (outside bilateral and multilateral schemes) were closed to foreign participants. Slovak nationals and/or research bodies established in Slovakia only may apply for national research funding. Joint programming also is limited by low financial and human resources and underdeveloped research infrastructure in Slovakia

The Ministry of Education, Science, Research and Sports (MESRS) submitted draft of the 'National Research Infrastructures Roadmap' (NRIR) in 2010. The European Strategy Forum on Research Infrastructures (ESFRI) roadmap should be approved by end of 2013 and related to the national RIS3 Strategy. The MESRS and its agencies, however, already participate in several ESFRI initiatives (e.g. Council of European Social Science Data Archives, The European Social Survey, Research Infrastructures Network for Research in Biodiversity, etc.). Access to Slovak research infrastructure by foreign researchers is provided under bilateral and multilateral schemes in S&T co-operation. The 'Information on the International Co-operation in Science and Technology in 2012' document (MESRS 2013) states that the Slovak Republic negotiated participation in four ESFRI initiatives in 2012. The total number of participation, however, is low. The MESRS intends to participate at least in 60% of the ESFRI initiatives by 2015.

Slovakia copes with underdeveloped research infrastructure. The MESRS and the Slovak Academy of Sciences suggested concentrating major part of the Structural Funds spending to some ten large-scale infrastructure projects aimed at building top-notch research centres (science parks) in biology, new materials and energy resources. The science parks should be involved in many ESFRI initiatives.

5.3 An open labour market for researchers

The HEI teachers and research workers are considered civil servants in Slovakia. Civil servant status determines salary levels for all senior academic and administrative staff. Salaries of all academic staff members are fixed or negotiated nationally due to their civil or public servant status, although the rector or dean may increase prescribed salary levels by as much as 100% (which is very rare). Basic salaries are computed via formulas based on academic degree and length of service.

In the [2013 National Reform Programme](#) the Slovak Government indicated its plans for overhaul of the HEIs accreditation system (reform of academic degrees, application of international evaluation standards, shift from the accredited study programmes to fields of study,

see chapter 4.1 for more details). The [2012 National Reform Programme](#) presented similar plans, but actual progress was limited by end of 2013.

As for the opening labour market, Slovakia continuously adopts standard European legislative, but accounts for very low numbers of foreign researchers and PhD students. The 404/2001 Law on Residence by Aliens entered into force on 1st January 2012 and replaced the outdated 48/2002 Law on Residence by Aliens. The law incorporated regulations of two Council Directives²¹ and enabled for easier access to Slovak labour markets by researchers from third countries. The law recognized nine types of temporary residence and work permits for the third country nationals, including the ‘research and development permit’. The permit covers research workers and staff in R&D institutions. It is given for a maximum of two years, and the applicant has to produce confirmation on contract and financial arrangements by the host institution. The MESRS published [list](#) of the Slovak R&D institutions accredited for research and development permits. There were 16 such institutions by end of 2012.

Foreign researchers in principle may apply for permanent jobs (including managerial) with Slovak HEIs and public research institutions. Such cases are rare. Many institutions require candidate to prove fluent Slovak language (which few foreigners master). There is anecdotal evidence on foreign nationals holding permanent and/or managerial positions. One of the 36 rectors of Slovak HEIs was a Polish citizen (and polyglot) in 2013.

The Slovak Academic and Information Agency manages Slovak version of the [EURAXESS webpage](#). The EURAXESS help researchers and their family to plan and organise their move to a foreign country, providing assistance in all matters related to mobility. The EURAXESS Slovakia mainly quotes available jobs for Slovak researchers wishing to work abroad, but there also were several job offers for foreign researchers coming to the Slovak R&D institutions in 2013.

5.4 Gender equality and gender mainstreaming in research

Slovakia adopted a number of generic legislative measures to ensure gender equality. Gender equality is pronounced in the Slovak Constitution (2001), Labour Code Law (2011) and the 365/2004 Antidiscrimination Law. By 2012 Slovakia accounted for relatively good gender balance in R&D in terms of total employment and researcher numbers. Shares of female R&D personnel (in head counts) in total R&D personnel were 43.1% in 2012 in Slovakia, while 34.7% in 2011 the EU27. There are no regulations on equal gender representation in academic and research committees, boards and governing bodies. In fact, women are rather underrepresented in top managerial posts. There, for example, were 15 female directors in 68 institutes and service organisations of the Slovak Academy of Sciences by end of 2013. There also were only 5 female rectors on 36 Slovak higher education institutions in 2013. The gender balance slowly improves over time. There were only 3 female rectors on 33 Slovak HEIs in 2008. The Eurostat data indicates that Slovakia accounted for rather low proportion of women on scientific boards (17% in 2008) compared to the EU27 (22%) ([Eurostat 2012](#)).

There are no legal and other barriers to the recruitment, retention and career progression of female researchers in Slovakia. All women in Slovakia are entitled to the 3 years maternity leave. The only exception from this rule is the fixed-term contract.

²¹ The 2009/50/EC Directive of 25 May 2009 (‘The Blue Card Directive’), and the 2009/52/EC Directive of 18 June 2009 on sanctioning illegal employment by the third country nationals.

5.5 Optimal circulation, access to and transfer of scientific knowledge including via digital ERA

The Slovak Government invests considerable means from the Structural Funds for building modern infrastructure for access to and preservation of scientific information, knowledge and technology transfer and promotion of digital research services. Two national projects ([National information system supporting research and development in Slovakia](#) and [Infrastructure for research and development - Data centre for research and development](#)) invest some €53.1m in period 2008-2014 to ICT infrastructure in Slovakia. Two national projects (Transfer of knowledge and technology from research and development into practice and National infrastructure supporting technology transfer in Slovakia) invest €235.1m in period 2008-2014. They support science parks, applied research projects, R&D co-operation projects and technology transfer centres in Slovak HEIs and public research organisations.

The policies for research and education-related public e-infrastructures and for associated digital research services are implemented by the Slovak Academic Network (SANET). The [SANET](#) is an independent civil association and supports education roaming services, building high-speed (100 gigabyte) network for Slovak academic community, issuing TERENA certificates, and extending infrastructure of the e-services from higher education and academic institutions to public authorities and secondary schools in 77 Slovak cities.

Annex 1. PERFORMANCE OF THE NATIONAL AND REGIONAL RESEARCH AND INNOVATION SYSTEM

Feature	Assessment	Latest developments
1. Importance of the research and innovation policy	<p>(-) Research and innovation policies have been fragmented between the Ministries of Economy and Education with a consequent lack of coordination in policy design and implementation.</p> <p>(-) Slovak R&I policies lacked clear thematic focus; societal challenges were inadequately addressed.</p> <p>(+) Problem of the fragmentation was recognised and plans for better co-ordination set in the RIS3 document.</p> <p>(+) The RIS3 document set main priorities in economic and technology specialisation, and specified major societal challenges for period 2014-2020.</p>	<p>(+) The Slovak Government Council for Science, Technology and Innovation became functional in April 2013. The Council may increase co-ordination by key stakeholders in R&D system.</p>
2. Design and implementation of research and innovation policies	<p>(+) The 2007 Innovation Strategy and the 2007 Long-Term Objective were first multiannual documents on R&I policies in Slovakia in 2007-2013.</p> <p>(-) Slovakia lacked an effective and stable centre-of-government structure in 2011—2012.</p> <p>(-) Slovak had no multiannual strategy for development of research and innovation. The 2007 Innovation Strategy and the 2007 Long-Term Objective did not include identification of emerging opportunities for smart specialisation. These documents also did not reflect EU priorities and missed clear direction toward joint programming.</p> <p>(-) Slovakia accounts for underdeveloped evaluation culture. Evaluation of the national and Structural Fund projects tends to be formal and does not make full use of output indicators, international benchmarking and ex-post evaluation tools.</p>	<p>(+) The RIS3 document was approved by the Slovak Government in November 2013. It is based on analysis of strengths and weaknesses at national and regional level and of emerging opportunities. The document explicitly mentions exploiting opportunities for joint programming and cross-border co-operation.</p> <p>(-) Process of the RIS3 preparation was subject to strong lobbying by mighty interest groups. Final version of the document lacks financial allocation for particular policy measures.</p>
3. Innovation policy	<p>(-) The 2007 innovation Strategy contained no sectorial priorities, but vast majority of the support measures concentrated in manufacturing. Concept of the service innovation was missing in Slovak innovation policies till 2013.</p>	<p>(+) The RIS3 document promotes a broad concept of innovation and species i.e. support to creative industries.</p>
4. Intensity and predictability of the public investment in research and innovation	<p>(-) Slovakia lacked predictable policy and budgetary frameworks for R&I. Slovak R&I system has increasingly relied on European resources, while national funding decreased in importance and was subject to budget</p>	<p>(-) Bulk of support to innovation takes forms of grants. The tax stimuli and innovation vouchers are used by a very limited extent.</p> <p>(-) Venture capital schemes were</p>

	<p>cuts.</p> <p>(-) Public investment to higher education (as percent of GDP) has been falling in 2010s. Budgets of the Slovak Academy of Sciences did not change in nominal and decreased in real terms.</p>	<p>supported from the national and EU resources since early 1990s, but there is no evidence that they promoted innovative solutions.</p> <p>(+) First loans from the JEREMIE initiative were provided in November 2013.</p>
5. Excellence as a key criterion for research and education policy	<p>(-) Slovak research and tertiary education rely on block grants. Competitive national funding accounts for some 8.6% of their budgets.</p> <p>(-) HEIs and SAS are evaluated on regular basis, but their budgets are low. Evaluation results have little impact for change in funding.</p> <p>(-) Funding to researchers is not portable across borders.</p> <p>(+) National projects are subject to peer review by international experts.</p> <p>(-) Structural Fund projects are not subject to peer review by international experts.</p> <p>(±) Higher education and research institutes enjoy the necessary autonomy to organise their activities in the areas of education, research, and innovation, but cope with very low financial resources.</p> <p>(-) The legal, financial and social frameworks for research careers, including doctoral studies, do not offer sufficiently attractive conditions to researchers.</p>	<p>(+) The 2013 National Reform Programme contains plans for increasing quality of research and teaching via introduction of international standards to HEIs accreditation.</p> <p>(-) Similar plans were presented in the past, but progress has been limited so far.</p>
6. Education and training systems	<p>(+) Slovakia accounts for above-average numbers of new doctorate graduates.</p> <p>(-) Most doctorate students concentrate in social science and humanities. Interest in science, technology, engineering and mathematics stagnates.</p> <p>(-) Entrepreneurship education and training are insufficiently developed..</p>	<p>(+) The 2013 National Reform Programme presents intentions for changing accreditation of study programmes into accreditation of fields of study. The change may increase flexibility of education and training curricula.</p>
7. Partnerships between higher education institutes, research centres and businesses, at regional, national and international level	<p>(-) Slovakia accounts for low levels of commercialisation of innovative ideas in terms of IPRs, royalty revenues and exports of knowledge-intensive services.</p> <p>(-) The academia and industry sectors were poorly interconnected.</p> <p>(-) It is difficult for researchers and innovators to move between public and private institutes</p>	<p>(+) The first innovation voucher scheme was launched in 2013.</p> <p>(+) Pilot project on support to cluster was launched in 2013.</p> <p>(+) Slovak Government used means from the Structural Funds and supported high numbers of R&D Centres, Competence Centres and Science parks.</p>
8. Framework conditions promote business investment in R&D, entrepreneurship and innovation	<p>(-) Policies to promote innovation, entrepreneurship and enhance the quality of the business environment are not closely interconnected.</p> <p>(-) Private venture capital market is small.</p> <p>(-) Slovak businesses (SMEs in particular) cope with low levels of law enforcement (problems with late payments, long judicial</p>	<p>(+) The JEREMIE initiative provides loans and guarantees to SMEs since November 2013.</p> <p>(±) The Government works on a complete overhaul of Civil and Business Codes. The new codes would not be ready before 2016.</p> <p>(-) The Slovak Government introduced</p>

	<p>procedures, etc.) and corruption in public tenders²². 'Rule of Law' has not fully established in Slovakia.</p> <p>(±) A system for the protection of intellectual property is in place, but Slovak SMEs account for low rates of innovation and generated low numbers of patent application, industrial designs, etc.</p>	<p>a number of austerity measures. It <i>inter alia</i> increased social and health insurance rates for personal businesses.</p>
<p>9. Public support to research and innovation in businesses is simple, easy to access, and high quality</p>	<p>(±) Slovakia runs a limited number of clearly differentiated national support schemes (VEGA, KEGA, RDA). The schemes have relatively simple rules, but account for low funding.</p> <p>(±) The Structural Fund schemes account for substantial financial resources, but also for high complexity and administrative hassle.</p> <p>(-) National funding support is mostly designed for the HEIs and SAS and is not tailored to the needs of companies, particularly SMEs (except for some RDA grants).</p> <p>(-). Funding schemes are not regularly evaluated and/or benchmarked against comparable schemes in other countries.</p> <p>(-) There are no specific schemes for young innovative companies.</p>	<p>(+) The RIS3 document presents plans for merging eight government agencies to two. The merge would enable for higher flexibility and complementarity of research support schemes.</p>
<p>10. The public sector itself is a driver of innovation</p>	<p>(-) There is no law or policy documents on public sector innovation.</p>	<p>(-) Demand-side policies concentrated on various e-government programmes and defence research. Most of the programmes generated no adequate results</p>

²² A survey on corruption behaviour in public tenders found that average bribe accounts for 13% of the total tender value in 2013 in Slovakia (€0.5b). Source: PAS (Alliance of Slovak Entrepreneurs), INEKO (Institute for Social and Economic Reforms), and Transparency International Slovakia (2013): [Korupcia oberá štát o pol miliardy eur ročne](#) {The State loses half billion in corruption costs}.

Annex 2. NATIONAL PROGRESS IN MEETING INNOVATION UNION COMMITMENTS

		Main changes	Brief assessment of progress / achievements
1	Member State Strategies for Researchers' Training and Employment Conditions	<p>(+) The blue card directive has been transposed into national legislation and is valid from 2012.</p> <p>(+) Accreditation of the Slovak Academy of Sciences' institutes performed in 2012.</p> <p>(+) New round of accreditation of the Slovak higher education institutions prepared for 2014. More stringent criteria set for accreditation.</p> <p>(+) Slovak government declared in its 2013 National Reform Programme impressive plans to reform of higher education and research system.</p> <p>(-) Budget for the Slovak Academy of Sciences has decreased since 2009.</p>	<p>(-) About 80% of research institutions in Slovakia joined the European Charter and Code for Researchers, but impacts of these arrangements on labour agreements are limited.</p> <p>(-) There are performance agreements through which national authorities may incentivise the effective implementation of the HRS4, but overall budgets of research institutions are low and decreasing in real terms over time.</p> <p>(-) Evaluation and accreditation results have little impact on labour and remuneration arrangements.</p> <p>(-) The job positions are open to all EU citizens since 2004, but interest by the EU and non-EU researchers in working in Slovakia is minimal.</p> <p>(+) The blue card and Scientific Visa package ease access to Third Countries' talent, but inflow of the Third Countries' professionals is low.</p> <p>(-) Plans for introduction of merit-based recruitment of researchers clash with reality of financial austerity.</p> <p>(-) Plans for reforming higher education and research system announced in the former National Reform Programmes were rarely implemented in full.</p>
4	ERA Framework		
5	Priority European Research Infrastructures	<p>(+) First draft of the ESFRI roadmap expected by end of 2013</p>	<p>(-) No financial commitments the construction and operation of the ESFRI Roadmap were set so far.</p> <p>(-) No regulation related to cross-border merit-based access to RI in place.</p> <p>(-) The Cyclotron Centre has been built since 1999, and had total estimated sunk costs €166m, but was dysfunctional by 2013.</p>
7	SME Involvement	<p>(+) The JEREMIE initiative in place</p> <p>(+) Ministry of Economy plans joining</p>	<p>(-) Slovak SMEs account for low R&I intensity.</p>

		<p>COSME programme.</p> <p>(+) The Research and Development Agency drafted plans for the new round of the 'Support to R&D in small, medium and large enterprises' programme in 2014-2018. Total state support is planned for €32.4m.</p>	<p>(-) State support to R&I is low.</p> <p>(-) The JEREMIE programme coped with significant administrative and organisational difficulties and is behind schedule.</p>
11	Venture Capital Funds	<p>(+) Pilot Innovation Voucher scheme launched in 2013.</p> <p>(+) Micro loans programme reintroduced in 2013.</p> <p>(+) Technology transfer schemes were supported from the Structural Funds and implemented in 2008-2013.</p> <p>(+) JEREMIE scheme in force since 2011.</p>	<p>(+) Venture capital schemes essentially re-started in 2012-2013.</p> <p>(+) Significant amount of capital provided via leverage measures.</p> <p>(-) Evaluation procedures for venture capital schemes remain underdeveloped.</p> <p>(-) Low numbers of applicants.</p> <p>(-) JEREMIE scheme coped with organisational difficulties and accounted for slow implementation.</p>
13	Review of the State Aid Framework	<p>(+) The Ministry of Economy drafted the Law No. 71/2013 on subsidises and implemented <i>de minimis</i> scheme on Support to Industry Clusters in 2013.</p>	<p>(-) Support to Industry Clusters scheme allocated mere €200,000 in 2013.</p> <p>(-) Total amount of the State Aid (€22.16m) was about 20 times lower than support to R&D and innovation provided by the Structural Funds in 2012 in Slovakia.</p>
14	EU Patent	<p>(+) The Slovak Republic signed the Agreement on a Unified Patent Court in February 2013.</p>	
15	Screening of Regulatory Framework	<p>(-) The issue has not been covered by the Slovak R&I policies so far.</p>	
17	Public Procurement	<p>(-) No national target on public procurement of innovative goods and services was in force by 2013 in Slovakia.</p> <p>(-) No public tenders with explicit innovation criteria were launched by 2013 in Slovakia.</p> <p>(-) No public tenders with joint public procurement of innovation were launched by 2013 in Slovakia.</p>	<p>(-) Slovakia has no national policy of public procurement of innovation in 2013.</p> <p>(-) The Structural Fund schemes (e.g. Operational Programme Information Society) significantly lagged behind the schedule and accounted for poor results.</p>
20	Open Access	<p>(+) The TERENA Certificate Services were provided by the Slovak Academic Network (SANET).</p> <p>(+) The Eduroam (world-wide roaming access service developed for the international research and education community) provided by the SANET.</p> <p>(+) 'SANET2' project aimed at building high-speed (100 gigabyte) network for Slovak academic community.</p>	<p>(+) Some 38 HEIs, 20 research institutes, 7 institutes of further education, 250 secondary schools, 100 primary schools and 6 libraries connected to TERENA in 2012 in Slovakia.</p> <p>(+) The SANET services for education and high-speed access operate well.</p>
21	Knowledge Transfer	<p>(+) The 'Transfer of knowledge and technology from research and development into practice' project invests €226.9m in period 2008-2013 and supports (i) building University science parks and research centres with Slovak HEIs and the Slovak Academy of Science; (ii) applied research projects; (iii) and R&D co-operation projects.</p> <p>(+) The 'National infrastructure supporting technology transfer in Slovakia' project</p>	<p>(-) Basic infrastructure for knowledge transfer is in place. New infrastructure (University Science Parks) is under construction.</p> <p>(-) There are few visible impacts of knowledge transfer schemes. Business research is very small (BERD = 36% GDP in 2012) and there are limited opportunities for knowledge transfer between</p>

		<p>invests €8.2m in period 2010-2014 and supports establishing technology transfer centres in Slovak Universities and public research organisations.</p> <p>(+) Research and Development Centres (RDC) projects supported applied research and co-operation by the industry and academia sector. Some 205 participants (of which 102 from business sectors) supported 93 R&D centres with €190m in 2008-2013.</p> <p>(+) Eight Competence Centres established. Some 74 participants received €57.59m in 2008-2013.</p>	<p>academia and industry sectors.</p> <p>(-) The Competence Centres coped with administrative and financial difficulties. Business partners could support CC, but were not allowed to use technical infrastructure of CC. Average project on CC included 9 partners, but accounted for low support (€0.7m).</p> <p>(-) No policy measures aimed at specific innovation related services to enterprises were in place.</p>
22	European Knowledge Market for Patents and Licensing	(-) The issue has not been covered by the Slovak R&I policies.	
23	Safeguarding Intellectual Property Rights	(+) The Slovak Government passed the National Strategy for Combating Counterfeiting and Piracy of Intellectual Property in 2012.	(-) There is no evidence whether the strategy is working or not.
24	Structural Funds and Smart Specialisation	(+) Four drafts of national RIS3 strategy produced in 2013.	(+) Slovakia made significant progress in drafting RIS3. The latest strategy draft reflects consultations with key stakeholders of the R&I system.
25	Post 2013 Structural Fund Programmes	(+) Advanced drafts of the Partnership Agreement and Operational Programme Research and Innovation produced in 2013.	(+) Slovakia made significant progress in drafting and aligning priorities RIS3, Partnership Agreement and Operational Programme Research and Innovation documents.
26	European Social Innovation pilot	(-) The issue has not been covered by the Slovak R&I policies.	
27	Public Sector Innovation	<p>(+) Land register scheme operates well.</p> <p>(-) E-health scheme is significantly behind schedule.</p> <p>(-) The UNITAS project failed completely.</p> <p>(-) Public procurement of military technologies provided ambiguous results.</p>	<p>(-) The e-government procurement schemes account for slow progress.</p> <p>(-) Spending by the Operational Programme Information Society is extremely slow.</p> <p>(-) Military research projects proved overpriced and generated no export markets.</p>
29	European Innovation Partnerships	<p>(+) The Slovak Republic is member in the EIPs on 'Active and Healthy Ageing', 'Agricultural Productivity and Sustainability', 'Water' and 'Raw Materials'.</p> <p>(+) The MESRS supported call in the Joint Programme in Neurodegenerative Disease Research in 2013.</p> <p>(-) No policy document on EIP was in force by 2013 in Slovakia. Membership in the EIP happened on the ad hoc basis.</p>	(-) No evaluations of the Slovak participation in EIP exist.

30	Integrated Policies to Attract the Best Researchers	<p>(+) The 404/2011 Law on Residence by Aliens the Blue Card Directive and introduced research work permits for the third country nationals.</p> <p>(+) Several research institutions applied for work permits for third country nationals in 2012.</p> <p>(+) 'Migration Policy of the Slovak Republic. Perspective until the year 2020' passed.</p>	<p>(+) The blue card and research work permits make access to Third Countries' talent easier, in theory.</p> <p>(-) Low wages and lack of global research infrastructure made Slovakia an unattractive destination for talented young researchers.</p> <p>(-) Slovakia has been coping with brain drain by young and talented people.</p>
31	Scientific Cooperation with Third Countries	<p>(+) Slovakia maintained its membership in many international organisations in 2012 and 2013.</p> <p>(+) Slovakia continued its support to bilateral co-operation projects in 2012 and 2013.</p> <p>(-) Financial support to international scientific co-operation with third countries remained very low.</p>	<p>(-) International co-operation with third countries lacked clear thematic focus.</p> <p>(-) Membership fees account for about 90% of total costs and support to projects activities was low.</p>
32	Global Research Infrastructures	<p>(+) Slovakia maintained membership in the CERN and Dubna research centres.</p> <p>(-) None of the ESFRI facilities and/or large infrastructures were placed in Slovakia.</p> <p>(-) Support to participation in global research infrastructures was quite low.</p>	<p>(-) No clear thematic focus in global research infrastructures.</p>
33	National Reform Programmes	<p>(+) The 2013 National Reform programme sets goals in R&D expenditure for 2020.</p> <p>(+) The 2013 National Reform programme confirms plans for reform of higher education and research system.</p>	<p>(-) It is not clear whether the R&D expenditure targets are realistic. The business R&D expenditure in 2012 (0.36% GDP) were less than half of the 2020 target (0.80% GDP).</p> <p>(-) Impressive plans for reforming higher education and research systems were presented many times in the past, but failed realisation.</p>

Annex 3 NATIONAL PROGRESS TOWARDS REALISATION OF ERA

ERA Priority	ERA Action code	ERA Action	Recent changes	Assessment of progress in delivering ERA
ERA priority 1: More effective national research systems	MS01	Action 1: Introduce or enhance competitive funding through calls for proposals and institutional assessments	None. The VEGA, KEGA and RDA agencies have not changed their statuses.	(-) Bulk of national funding to research is delivered in block grants.
	MS02	Action 2: Ensure that all public bodies responsible for allocating research funds apply the core principles of international peer review	None. The 2014 round of the HEIs accreditation should contain more stringent rules on evaluation.	(±) National research grant applications must be peer-reviewed by at least one foreign expert. The Structural Fund project proposals are evaluated by domestic evaluators only.
ERA priority 2: Optimal transnational co-operation and competition	MS06	Action 1: Step up efforts to implement joint research agendas addressing grand challenges, sharing information about activities in agreed priority areas, ensuring that adequate national funding is committed and strategically aligned at European level in these areas	None. Slovakia continues running some bilateral and multilateral projects in S&T, but joint programming remains underdeveloped and is not addressed by current R&I policies by 2013.	(+) The RIS3 document contains policy measures supporting joint programming and joint research agendas addressing grand challenges.
	MS07	Action 2: Ensure mutual recognition of evaluations that conform to international peer-review standards as a basis for national funding decisions	None. No initiative was launched to ensure mutual recognition of evaluations.	(-) No progress.
	MS08	Action 3: Remove legal and other barriers to the interoperability of national programmes to permit joint financing of actions including cooperation with non-EU countries where relevant	None. Joint financing of actions (including cooperation with non-EU countries) is allowed only in the bilateral and multilateral co-operation programmes.	(+) The RIS3 document contains policy measures supporting cross-border interoperability of national programmes
	MS15	Action 4: Confirm financial commitments for the construction and operation of ESFRI, global, national and	Ministry of Education submitted the national roadmap for the ESFRI to Slovak Government in 2010.	(+) Slovakia already participates in several ESFRI projects, on ad hoc basis. (+) National Roadmap and Action plan for the ESFRI are

		regional RIs of pan-European interest, particularly when developing national roadmaps and the next SF programmes		under preparation.
	MS16	Action 5: Remove legal and other barriers to cross-border access to RIs	Slovakia continues running some bilateral and multilateral projects in S&T. Some large-scale R&I projects are under construction.	(+) High number of R&D Centres and Competence Centres were built. Science parks are under construction. Hundreds millions of euros invested in RI.
ERA priority 3: An open labour market for researchers	MS24	Action 1: Remove legal and other barriers to the application of open, transparent and merit based recruitment of researchers	The 2013 National reform programme presents plans for changing introducing merit-based recruitment of researchers and reform of academic titles.	(-) No Slovak HEI was included in the Shanghai list of top 500 HEIs/ The Webometrics lists only one Slovak HEI in top 1000. Slovak HEIs lag considerably behind their competitors in the Czech Republic, Hungary and Slovenia.
	MS25	Action 2: Remove legal and other barriers which hamper cross-border access to and portability of national grants	None. National funding for R&D is designed for the Slovak nationals and/or HEIs and research bodies established in the Slovak Republic only (except for the bilateral and multilateral co-operation programmes)	(-) No plans for portability of national grants were scheduled in key R&I policies in Slovakia.
	MS26	Action 3: Support implementation of the Declaration of Commitment to provide coordinated personalised information and services to researchers through the pan-European EURAXESS3 network	The EURAXESS operated well and offered publish job vacancies in Slovakia and other countries.	(+) The EURAXESS increases mobility of researchers from/to Slovakia. (-) The EURAXESS may speed-up brain-drain by young talented researchers from Slovakia.
	MS27	Action 4: Support the setting up and running of structured innovative doctoral training programmes applying the Principles for Innovative Doctoral Training.	None.	(±) The RDA developed the Human Potential Programme in 2006-2010. The programme supported training young and talented researchers. The RDA plans re-launching this programme in 2014-2018
	MS28	Action 5: Create an enabling framework for the implementation of the HR Strategy for Researchers incorporating the Charter & Code	None	(+) Key Slovak HEIs and SAS (employing 80% Slovak researchers) adopted "HR Strategy for Researchers" incorporating the Charter & Code.
ERA priority 4: Gender equality and gender mainstreaming in research	MS39	Action 1: Create a legal and policy environment and provide incentives	No specific provision, the issue is covered by the general legislation (Constitution, Labour Code, Antidiscrimination Law)	(+) Females accounted for some 43% of total R&D staff in headcounts in 2012. (-) Females are underrepresented in top managerial positions. There were just five female rectors out of 36 total in 2013 in

				Slovakia.
	MS40	Action 2: Engage in partnerships with funding agencies, research organisations and universities to foster cultural and institutional change on gender	Some public sector bodies collect evidence on gender issues in science.	(+) The Central Information Portal for Science and Technology publishes information of Slovak female scientists: success stories, interviews and profiles of excellent Slovak female researchers. The information is part of the Popularisation of Science Strategy.
	MS41	Action 3: Ensure that at least 40% of the under-represented sex participate in committees involved in recruitment/career progression and in establishing and evaluating	No legal provisions are made for equal gender representation in academic and research committees, boards and governing bodies.	(-) The issue has not been addressed by the Slovak R&I policies so far.
ERA priority 5: Optimal circulation, access to and transfer of scientific knowledge including via digital ERA	MS45	Action 1: Define and coordinate their policies on access to and preservation of scientific information	Two national projects continue promoting access to and preservation of scientific information.	(+) Two national projects invest €19.9m and €33.1m respectively in period 2008-2014. They support building information infrastructure and data centres.
	MS46	Action 2: Ensure that public research contributes to Open Innovation and foster knowledge transfer between public and private sectors through national knowledge transfer strategies	Two national projects continue promoting Open Innovation and knowledge transfer.	(+) Two national projects invest €226.9m and €8.2m respectively in period 2008-2014. They support building science parks, applied research projects and technology transfer centres. (-) The technology transfer centres generated no visible results.
	MS47	Action 3: Harmonise access and usage policies for research and education-related public e-infrastructures and for associated digital research services enabling consortia of different types of public and private partners	The policies for research and education-related public e-infrastructures and for associated digital research services are implemented by the Slovak Academic Network (SANET).	(+) The SANET performs well.
	MS48	Action 4: Adopt and implement national strategies for electronic identity for researchers giving them transnational access to digital research services	Slovakia is a member of the TERENA network and is represented via the SANET. In 2011 the SANET joined the TERENA Certificate Service (TCS) and started provision of TLS/SSL server certificates.	(+) The SANET services cover high numbers of research institutions, HEIs, secondary schools, primary schools and scientific libraries.

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LIST OF ABBREVIATIONS

ASFEU	Agency for Structural Funds of the Ministry of Education, Science, Research and Sports (Agentúra pre štrukturálne fondy Ministerstva školstva, vedy a výskumu SR)
BERD	Business Expenditures for Research and Development
CERN	European Organisation for Nuclear Research
ERA	European Research Area
COST	European Cooperation in Science and Technology
ERA-NET	European Research Area Network
ESA	European Space Agency
ESFRI	European Strategy Forum on Research Infrastructures
FP	European Framework Programme for Research and Technology Development
EU	European Union
EU-27	European Union including 27 Member States
FDI	Foreign Direct Investments
FP	Framework Programme
FP7	7th Framework Programme
GBAORD	Government Budget Appropriations or Outlays on R&D
GDP	Gross Domestic Product
GERD	Gross Domestic Expenditure on R&D
GOVERD	Government Intramural Expenditure on R&D
GUF	General University Funds
HEI	Higher education institutions
HERD	Higher Education Expenditure on R&D
HEIs	Higher education institutions
HES	Higher education sector
IP	Intellectual Property
KEGA	KEGA Grant Agency (Grantová agentúra KEGA)
NADSME	National Agency for Small and Medium Enterprises (Národná agentúra pre malé a stredné podniky)
NRIR	National Research Infrastructures Roadmap
PRO	Public Research Organisations
OECD	Organisation for Economic Co-operation and Development
OPCEG	Operational Programme ‘Competitiveness and Economic Growth’ (Operačný program Konkurencieschopnosť a hospodársky rast)
OPE	Operational Programme ‘Education’ (Operačný program Vzdelávanie)
OPRD	Operational Programme ‘Research and Development’ (Operačný program Výskum a vývoj)
R&D	Research and development
RDA	Research and Development Agency (Agentúra pre výskum a vývoj)
R&I	Research and innovation
RI	Research Infrastructures
RIS3	Research and Innovation Strategies for Smart Specialisation
RNP	Research Networking Programmes
RTDI	Research Technological Development and Innovation
SAS	Slovak Academy of Sciences (Slovenská akadémia vied)

SF	Structural Funds
SIEA	Slovak Innovation and Energy Agency (Slovenská inovačná a energetická agentúra)
SME	Small and Medium Sized Enterprise
SRGBST	Slovak Republic Government Board Council for Science, Technology and Innovation (Rada vlády SR pre vedu, techniku a inovácie)
SRDP	State Research and Development Programmes (Štátne programy výskumu a vývoja)
S&T	Science and technology
VEGA	VEGA grant agency (Grantová agentúra VEGA)
VC	Venture Capital

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