# Deloitte.

Researchers' Report 2013

**Country Profile: Estonia** 



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# 1. Key data

#### National R&D intensity target

"Estonia had an R&D intensity of 2.36% in 2011, with a steep increase from 1.63% in 2010. The increase is significantly due to the private R&D sector expenditures, which doubled in 2011 compared to 2010 in absolute numbers. In relative terms, the business expenditures for R&D as percentage of GDP represent 1.40% in 2011, from 0.82% in 2010, with a remarkable overall annual growth rate of 24.4 between 2000 and 2011. Public expenditures on R&D reached a share of 0.87% of GDP in 2011. With an ambitious 3% R&D intensity target for 2020 (with a 2% milestone in 2015), Estonia takes a decisive commitment for achieving a key feature for an ambitious growth path towards a knowledge-based society.

The Estonia 2011 strategy foresaw a major boost in 2011 provided by front-loaded EU structural funds estimated at up to 1.2% of GDP. Currently 24.7% of the total Structural Funds available to Estonia is allocated to research, innovation and entrepreneurship, which is very close to the overall 25% average at EU level. The current rate of absorption of the funds dedicated to R&I and entrepreneurship is 57.1%. Notwithstanding the high level of public funding of R&D, reaching the 2020 R&D intensity target will depend both on the ability to attract R&D intensive foreign direct investment and a further significant growth in business R&D. Business R&D expenditure as a percentage of GDP has already increased from 0.14% in 2000 to 0.64% in 2009 to 0.81% in 2010. The expected leverage effect of the front-loaded EU structural funds for business R&D will be closely monitored.

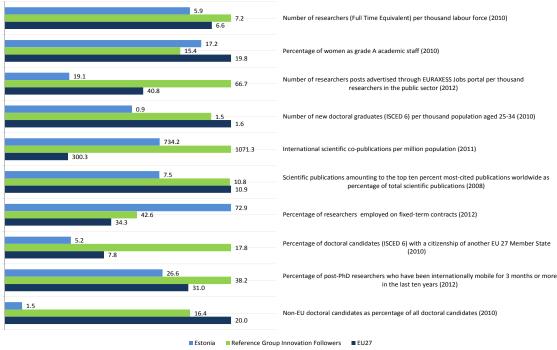
The total number of Estonian participants in the 7th Framework Programme is so far 342 (out of 1 567 applicants). They have in total received EUR 552 million. The rate of participant success is 21.83%, which is slightly below the EU average rate of success of 21.95%."<sup>2</sup>

#### Key indicators measuring the country's research performance

The figure below presents key indicators measuring Estonia's performance on aspects of an open labour market for researchers against a reference group and the EU-27 average<sup>3</sup>.



Figure 1: Key indicators - Estonia



According to Eurostat provisional data for 2011

<sup>&</sup>lt;sup>2</sup> European Commission (2013), "Research and Innovation performance in EU Member States and Associated countries. Innovation Union progress at country level 2013"

The values refer to 2012 or the latest year available

Data: Eurostat, SHE Figures, EURAXESS Jobs Portal, UNESCO OECD Eurostat education survey, Innovation Union Scoreboard 2013, MORE2 Notes: Based on their average innovation performance across 25 indicators, Austria, Belgium, Cyprus, Estonia, France, Ireland, Luxembourg, Netherlands, Slovenia and the UK show a performance close to that of the EU27. These countries are the Innovation followers<sup>4</sup>.

#### Stock of researchers

The table below presents the stock of researchers by Head Count (HC) and Full Time Equivalent (FTE) and in relation to the active labour force.

Table 1: Human resources - Stock of researchers

Indicator	Estonia	EU Average/Total
Head Count per 1 000 active labour force (2010)	10.91	10.17
Head Count (2010)	7 491	2 435 487
FTE per 1 000 active labour force (2010)	5.94	6.64
Full time equivalent (FTE) (2010)	4 077	1 589 140

Source: Deloitte

# 2. National strategies

The Estonian Government has adopted a package of measures aimed at training enough researchers to meet its R&D targets<sup>5</sup> and at promoting attractive employment conditions in public research institutions. The table below presents key programmes and initiatives intended to implement the strategic objectives to train enough researchers to reach Estonia's R&D targets, to promote attractive working conditions, and to address gender and dual career aspects.

**Table 2: National strategies** 

Measure	Description
Estonian Enterprise Policy 2007-2013	The Estonian Enterprise Policy sets out strategic goals for the development of Estonian enterprises. The entrepreneurship development plan is supplemented by a three-year implementation plan describing activities, implementing bodies, and desired outputs.
Estonia 2020 Competitiveness Strategy (2011)	The Strategy identifies key policy priorities and describes measures to improve Estonia's competitiveness by the years 2015 and 2020 in line with objectives of the Europe 2020 Strategy. Amongst others, the Strategy aims to "improve the quality of the educational system and adapt it to demographic changes" by improving students' key competencies, promoting training, financing education and attracting highly qualified researchers to come and work in Estonia.
Higher Education Strategy (2006-2015)	The Estonian Higher Education Strategy aims to strengthen the international dimension of the national higher education system. In addition, it explores possibilities for boosting the competitiveness of Estonia's research institutions in the coming years. The document also explores the use of national and European Structural Funds to develop and implement practices set out in the Strategy.
Operational Programme for Human Resource Development (2007-2015)	The Operational Programme for Human Resource Development promotes progress towards a knowledge-based economy and society by means of a comprehensive support programme in the following priority areas: lifelong learning, R&D development, human resources in higher education, quality of working life, knowledge and skills for innovative enterprise, administrative capacity and activities for technical assistance. It is coordinated by the Ministry of Education and Research while all activities are financed through the European Social Fund.
Strategy for the Internationalisation of Estonian Higher Education (2006-2015)	In 2007, the Minister of Education and Research (MER) endorsed a Strategy for the Internationalisation of Estonian Higher Education (2006-2015) following an extensive national debate. Internationalising the higher education system is to achieve the following objectives:

<sup>&</sup>lt;sup>4</sup> European Commission (2013), "Innovation Union Scoreboard 2013"

The Estonian government aims to increase the proportion of employee, engaged in R&D to 8 researchers and engineers per 1 000 employees by the year 2013 (compared to 5.0 in 2004, 6.06 in 2008, and 7.24 in 2009). Following the recession of 2010, the number of full-time scientists and engineers continued to grow. The number of scientists and engineers in the business sector in FTE's rose 17.3% from 1 281.6 to 1 504 and the total number to 4 511.7 (+10.5%). The total number of employees amounted to 0.71 full-time researchers in 2010 and 0.74 in 2011. To reach the targets of the strategy more than 1 000 scientists and engineers are needed, particularly in the business sector

Measure	Description		
	<ul> <li>Improve the international competitiveness of Estonia's higher education system;</li> <li>Make Estonian higher education institutions more visible; and</li> <li>Create a legal and institutional environment in support of internationalisation.</li> </ul>		
The Estonian Research and	Knowledge-based Estonia <sup>6</sup> proposes sustainable development of Estonian society		
Development and Innovation Strategy (RD&I Strategy) – Knowledge-based Estonia (2007-2013)	through research and development and innovation. In addition, it contributes to the achievement of the objectives of the "Sustainable Estonia 21" strategy as well as the Lisbon Strategy. It defines the goals, priorities and major policy instruments for research and development and innovation policies. The Strategy's three principal objectives are:  1. Competitive quality and increased intensity of research and development; 2. Innovative enterprises creating new value in the global economy; 3. An innovation-friendly society aimed at a long-term development.		
	The objectives are to be achieved by:  - Development of human capital;  - Organising public sector RD&I more efficiently;  - Increasing enterprises' innovation capacity; and  - Policy-making aimed at long-term development.		

# 3. Women in the research profession

### Measures supporting women researchers in top-level positions

Usually, committees, councils and other collegial bodies formed by the State or financing agencies include both sexes.

The number of women enrolling in higher education has increased in recent years and this was also obvious in the number of R&D personnel. The share of female researchers has increased continuously since 1996, and their number is nearly equal to that of male researchers. In 2011, the ratio of female researchers in Estonia was 43.7% (compared to 41.7% in 2008, 42.5% in 2009 and 43.4% in 2010). The EU average is 32%. This trend is also present in traditionally "masculine" areas like engineering, manufacturing and construction, where the share of women among graduates has grown. Nevertheless, at the same time, the share of women in higher executive positions in R&D remains modest. In 2010, the percentage of women grade A academic staff was 17.2% in Estonia compared with 15.4% among the Innovation Union reference group and an EU average of 19.8%.

The Gender Equality Act (2004) promotes policies addressing gender balance and encourages the State, local governments, agencies, educational and research institutions, and private companies to support gender equality. Gender equality is explicitly referred to in the Constitution of the Republic of Estonia (Chapter II Fundamental Rights, Freedoms and Duties, § 12).

#### Measures to ensure a representative gender balance

The Estonian Government has not introduced specific gender quotas in support of gender equality either in the public or the private sector. Excellence is the main criterion for researchers to receive funding and to participate in decision-making bodies.

#### **Maternity leave**

In Estonia, female researchers are paid by the State during maternity leave. Since 2007, fathers have had the right to receive a "parental benefit" once the child is seventy days' old.

The "Parental Benefits Act" provides parents with their average salary from the preceding calendar year for the time they temporarily take off work to care for their children. Parental leave is up to three years, but only the

<sup>&</sup>lt;sup>6</sup> Full text available at http://www.akadeemia.ee/\_repository/File/ALUSDOKUD/Knowledge-based%20Estonia%20II.pdf

<sup>&</sup>lt;sup>7</sup> The Estonian National Strategy on Sustainable Development - Sustainable Estonia 21 (SE21) adopted in 2005 suggests means and solutions for harmonised activity on the part of the various social players in ensuring the sustainability of Estonia over a period of thirty years. (Full text available at: <a href="http://www.riigikantselei.ee/failid/Estonia">http://www.riigikantselei.ee/failid/Estonia</a> SDS 2005.pdf)

<sup>8</sup> See Figure 1 "Key indicators – Estonia"

first half of that period is paid leave. All parents have the right to enjoy parental benefits. Part-time schemes and flexible hours are also promoted.

In awarding grants, periods during which a person was/is on parental leave are taken into account when analysing the eligibility criteria as part of the total number of years from obtaining a PhD degree.

If a researcher is part of the team of a project and the project ends during the parental leave, it is up to the host institution to find a research position in which to employ the researcher. In cases of personal research funding, the duration of the project is extended in the event of the principal researcher's parental leave.

# 4. Open, transparent and merit-based recruitment

#### **Recruitment system**

In Estonia, the recruitment of researchers is considered as open and transparent.

Universities and R&D Institutions are fully autonomous in their recruitment policies. The Estonian public universities have signed the "Agreement on Good Practice" is support of the internationalisation of Estonia's Higher Education Institutions. The Agreement encourages the employment of foreign research staff and the enrolment of international students. All universities hosting EURAXESS Services Centres have signed the Agreement.

#### Open recruitment in institutions

The table below presents information on open recruitment in higher education and public research institutions.

Table 3: Open recruitment in higher education and public research institutions

Do institutions in the country currently have policies to?	Yes/No	Description
<ul> <li>publish job vacancies on relevant national online platforms</li> </ul>	Yes	The trend is to publish more on online platforms. According to the Organisation of Research and Development Act, §9 <sup>9</sup> and University Act, §34 <sup>10</sup> , all regular teaching and research positions in R&D institutions have to be filled by public competition.
<ul> <li>publish job vacancies on relevant Europe-wide online platforms (e.g. EURAXESS)</li> </ul>	Yes	All professorships are openly recruited nationally and internationally. Institutions are encouraged to publish job openings on Europe-wide online platforms if the curricula provide international teaching.
<ul> <li>publish job vacancies in English</li> </ul>	Yes	EURAXESS is recommended. The law does not require institutions to publish job vacancies in English.
<ul> <li>systematically establish selection panels</li> </ul>	Yes/No	Several universities have made progress in establishing new election rules.
<ul> <li>establish clear rules for the composition of selection panels (e.g. number and role of members, inclusion of foreign experts, gender balance, etc.)</li> </ul>	No	
<ul> <li>publish the composition of a selection panel (obliging the recruiting institution)</li> </ul>	No	-
<ul> <li>publish the selection criteria together with job advert</li> </ul>	Yes/ No	The selection criteria are published in the employment regulation rules of the universities, and are available on their websites. These rules are then referred to in the advert.
<ul> <li>regulate a minimum time period between vacancy publication and the deadline for applying</li> </ul>	Yes	The university employment regulation rules seek to regulate a minimum time period between vacancy publication and the deadline for applying.
<ul> <li>place the burden of proof on the employer to prove that the recruitment</li> </ul>	Yes	The election rules in universities and the Estonian employment legislation are designed to ensure an open

<sup>&</sup>lt;sup>9</sup> https://www.riigiteataja.ee/akt/13243080

<sup>10</sup> https://www.riigiteataja.ee/akt/108112010008

	institutions in the country currently have icies to?	Yes/No	Description
	procedure was open and transparent		and transparent recruitment procedure.
_	offer applicants the right to receive adequate feedback	Yes	Institutions offer applicants the right to receive adequate feedback based on the election rules (in most cases upon request).
_	offer applicants the right to appeal	No	N/A

#### **EURAXESS Services Network**

In 2012, the number of researchers posts advertised through the EURAXESS Jobs portal per thousand researchers in the public sector was 19.1 in Estonia compared with 66.7 among the Innovation Union reference group and an EU average of 40.8<sup>11</sup>.

Information on entry conditions, transfer of social security and pension contributions, finding accommodation and administrative assistance is available on the EURAXESS Estonia portal (http://euraxess.ee) as well as through the EURAXESS Services Network Services Centres. A "Study in Estonia" portal is also available, but is mainly addressed to international students (http://www.studyinestonia.ee).

Most publicly funded research jobs are published online. Depending on the institution, either all or a selection of the vacancies is also advertised in English on the institution's website. The EURAXESS Jobs portal is increasingly used in cases where universities are specifically looking for someone from abroad to fill the position.

# 5. Education and training

#### Measures to attract and train young people to become researchers

The number of PhD students<sup>12</sup> (including in science and technology) has increased considerably over the last decade or so. The number of entrants rose from 280 for the academic year 2000-01 to 574 in 2010-11. In 2012-13, the number decreased slightly to 392 entrants. The decrease may result from the implementation of significant Government reforms in the financing of higher education (started in 2011) and the implementation of the new financing model (2013).

The total number of doctoral students enrolled in Estonian universities has risen from 2 381 in 2007-08 to 3 044 in 2012-13 (compared to 2 928 in 2010-11).

The proportion of women in the higher education system has increased steadily over the last few years, from 51% in 1993-94 to 60% in 2010-11<sup>13</sup> but it fell slightly to 59% in 2011-12 and to 58% in 2012-13. Female researchers are relatively well represented in Estonia and in particular, in traditionally "masculine" areas like engineering, manufacturing and construction. Nevertheless, the number of women in higher executive positions in R&D remains modest.

The Estonian Higher Education Strategy and the RD&I Strategy (see chapter 2 "National Strategies") set a target of 300 PhD graduates per year by 2015. However, the majority of doctoral candidates interrupt their studies or show low work efficiency. Many doctoral students work outside the university as the doctoral allowance is insufficient and social security provisions have so far not been covered by universities.

The new career model for researchers will introduce positive changes in the status of PhD students from 2012. All officially recognised doctoral candidates will receive a doctoral allowance (if their profile is that of a doctoral student). It is also possible to hire doctoral students as early-stage researchers. They will also receive social security coverage.

<sup>&</sup>lt;sup>11</sup> See Figure 1 "Key indicators – Estonia"

<sup>&</sup>lt;sup>12</sup> The Estonian government aims to achieve 300 PhD graduates by the year 2015 (compared to 105 in 2002/03, 138 in 2003/04, 119 in 2004/05, 143 in 2005/06, 153 in 2006/07, 161 in 2007/08, 160 in 2008/09, 175 in 2009/10, 250 in 2010/11, and 190 2011/12). Currently, there is an efficiency problem with regard to doctoral studies: of those who started their studies between the 2003/04 and 2007/08, only 41% completed their studies between 2006/07 and 2010/11 despite several measures designed to boost the doctoral studies (for example doctoral schools, mobility schemes, new financing model)

<sup>&</sup>lt;sup>13</sup> At a glance: 61% in 2006/07, 62% in 2007/08, 62% in 2008/09 and 61% in 2009/10

The development of science and technology is a national priority for the Estonian government. Following a few years of decline in the late 1990s, the proportion of students in science, technology, engineering and mathematics (STEM) subjects has increased. The absolute number of students in 2011-12 was 17 792 and in 2012-13 was 17 897. During the academic year 2012-13, STEM students accounted for 28% of the total student population (compared to 26% in 2010-11).

According to the Estonian Research and Development and Innovation Strategy, the Estonian Government puts emphasis on attracting talented school children and guiding them to become researchers. The government has created new programmes and has improved existing initiatives aimed at improving the image of the R&D profession and thus attracting young people to become researchers. The table below summarises the key measures implemented to achieve this objective.

Table 4: Human Resources – Key programmes and initiatives

Measure	Description
AHHAA Science Centre	The AHHAA Science Centre is one of the oldest and most successful science centres in Eastern Europe. Founded by the University of Tartu, the City of Tartu and the Ministry of Education and Research, its chief purpose is to use interactive tools to introduce science to people. The initiative also serves to strengthen the scientific excellence of participating researchers.  Since its foundation in 1997, the AHHAA Science Centre has supported a series of events, exhibitions, science festivals, workshops, and science theatres, and has welcomed approximately one million visitors. Since its opening in May 2011, the new AHHAA Science Centre in Tartu has attracted tens of thousands of visitors from Estonia, Latvia and Russia.
Association of Young Scientists (ongoing)	The Association of Young Scientists actively promotes careers in science and technology among secondary school students by involving them in the everyday work of different research groups and prominent scientists. Its activities are supported by the Ministry of Education and Research and are coordinated by the Estonian Research Council 14.
Pupils' Inventor Contest (ongoing)	The Pupils' Inventor Contest has become one of the most popular and most successful contests in Estonia. Schools organise science conferences and seminars at which students present and discuss their work, and meet with scientists. The contest encourages competition among students. The initiative is coordinated by Estonian Research Council.
Science communication programme TeaMe (2009- 2015)	Financed by the European Social Fund, the TeaMe Programme promotes young people's interest in science and technology (S&T). It targets young Estonians (14-26 years), general education and secondary school teachers, journalists covering science and technology (S&T) topics, researchers, scientists and engineers. The Programme pursues the following objectives:  - Encourage young people's interest in S&T and improve the image of S&T-related professions;  - Expand the scope of Estonia's science media; and  - Bring science closer to the people and increase its visibility in the media.  The TeaMe Programme is coordinated by the Estonian Research Council while the Estonian Public Broadcasting functions as a partner organisation exploring opportunities of science media. The total budget is EUR 3.3 million.
Teeme Call (2009-15)	In 2009, the Teeme Programme was launched in support of education in Mathematics, Science and Technology (MST). It provides public funding for science communication events, science camps, technology days, and get-together activities for university students and high school pupils. The total budget is EUR 1 million.
The Gifted and Talented Development Centre and the University of Tartu (GDTC)	The Gifted and Talented Development Centre and the University of Tartu offer pupils interested in science an opportunity to further develop their scientific knowledge and skills. Talented (elementary school and high school) pupils can choose from various enrichment courses offered in the GDTC curriculum. The GDTC has developed teaching courses for teachers and schools supporting individualised learning which prove useful for extracurricular activities.
The Science Bus Suur Vanker ('Big Dipper') (ongoing)	Using the Science Bus <i>Suur Vanker</i> ('Big Dipper', i.e. Ursa Major), physics students from the University of Tartu and from the Estonian Physical Society demonstrate interesting physical experiments to the general public. The bus and its team have so far visited more

<sup>&</sup>lt;sup>14</sup> The Estonian Research Council (www.etag.ee) is a funding agency for Estonian research, established on the 1st of March 2012. The Estonian Research Council is a government foundation that was established as a successor to the Estonian Science Foundation and merged with the Research Cooperation Centre of the Archimedes Foundation

Measure	Description	
	than one third of all schools in the country. The chief objective of the Science Bus is to	
	bring physics and science closer to school children and to communicate science by means	
	of shows and experiments. In 2006, the Science bus and its team received the "European	
	Descartes Prize for Science Communication".	

### Doctoral graduates by gender

The table below shows the number of doctoral graduates in Estonia by gender as a ratio of the total population.

Table 5: Doctoral graduates by gender

Indicator	Estonia	EU Average
New doctoral graduates (ISCED 6) per 1 000 population aged 25-34 (2010)	0.9	1.5
Graduates (ISCED 6) per 1 000 of the female population aged 25-34 (2010)	1.0	1.4
Graduates (ISCED 6) per 1 000 of the male population aged 25-34 (2010)	0.8	1.6

Source: Eurostat (2011) Data: Eurostat

#### **Funding of doctoral candidates**

The table below summarises different funding opportunities for doctoral candidates.

Table 6: Funding schemes available to doctoral candidates

Funding scheme	Description
Fellowship	There is a state-financed doctoral allowance to cover full doctoral study time (nominal time in Estonia is 4 years). From the 2012 admissions year, all doctoral candidates who have received certification under the terms and conditions, and pursuant to the procedure established by the council of the university, or are first-year students in a state-commissioned study place have a right to receive the allowance.
Stipend/Grant	In Estonia, it is permitted for doctoral students to receive stipends from research grants and, for example, from doctoral schools. Some enterprises also pay stipends to doctoral students who are enrolled in a subject area linked to the enterprise's business.
Employment contract	Since 2012, the position of an early-stage researcher ( <i>nooremteadur</i> ) as part of the researcher's career model has also been open to doctoral candidates. A Master degree is required for an early-stage researcher position (Organisation of Research and Development Act). This targets doctoral students with the ultimate aim of enhancing their motivation and boosting candidates' confidence by offering full social security coverage.

Source: Deloitte

#### Measures to increase the quality of doctoral training

The Estonian Government focuses on the enhancement of the quality and efficiency of doctoral studies through the organisation of doctoral schools, mobility opportunities for both incoming and outgoing researchers, and the development of entrepreneurship (by introducing economics courses and modules for students of non-business studies in all three university circles<sup>15</sup>).

The table below summarises the main measures introduced by the Estonian Government in support of doctoral training.

Table 7: Measures to increase the quality of doctoral training

Measure	Description
Doctoral Schools (ongoing)	Doctoral schools were set up in 2005. In 2009, thirteen new Doctoral Schools were selected for the period 2009-15. Their aim is to improve the quality of doctoral candidate tutoring and to increase the efficiency of doctoral studies in Estonia through interdisciplinary, international and national cooperation. Apart from mobility opportunities, winter and summer schools and study programmes, doctoral schools propose transferable and social skills training to promote interdisciplinary research and enhance cooperation between universities and the private sector.

 $<sup>^{\</sup>rm 15}$  Bachelor, Master and Doctoral studies.

Measure	Description
	From 2010, students who have interrupted their doctoral studies are welcome to continue and finish their studies – i.e. they are given a second chance. Those resuming doctoral studies may participate in doctoral schools. These help them find supervisors and participate in summer schools, conferences and mobility activities provided by doctoral schools. At least two partners need to be involved: they can be an Estonian university, an R&D institution, the public sector or companies. Doctoral schools are project-based and are funded by the European Social Fund. The total budget is EUR 16.9 million for 2009-15.
Mobility programmes	See chapter 8 "Mobility and international attractiveness".
Primus Programme (2008-2014)	<ol> <li>The Primus Programme aims at improving the professional competitiveness of higher education institution graduates. It supports the following six activities:         <ol> <li>Improvement of the teaching and supervising skills of teaching staff;</li> <li>Development of high-quality education based on learning outcomes;</li> <li>Development of the quality of recognition of prior learning and professional experience;</li> <li>Support for strategic management capacity building in higher education institutions;</li> <li>Carrying out surveys and analyses on higher education; and</li> <li>Development of student support services.</li> </ol> </li> <li>The Programme is financed by the European Structural Funds. The total budget is EUR 14.6 million for 2008-14. The programme is coordinated by Archimedes Foundation.</li> </ol>

#### Skills agenda for researchers

In Estonia, doctoral study programmes usually include training in transferable skills<sup>16</sup> to improve researchers' employment skills and competencies (based on the Standard of Higher Education, Regulation No 178 of 18 December 2008). Doctoral schools, curricula development activities, lectures, seminars, practical training classes, laboratory work and individual classes can be developed by each institution with the aim of acquiring knowledge and achieving better learning outcomes for participants.

Many doctoral students are involved in different projects to make science and technology more attractive for young people but also to develop their own communication skills. Extra courses are mostly project-based and are financed by Government.

The Estonian Rectors' Conference has endorsed a "Quality Agreement" among Estonian universities (six public universities and one private) encouraging the inclusion of transferable skills' training in doctoral studies curricula.

# 6. Working conditions

## Measures to improve researchers' funding opportunities

The table below presents the measures to improve funding opportunities for researchers in Estonia:

Table 8: Measure to improve researchers' funding opportunities

Measure	Description	
Centres of Excellence (2007-	Centres of Excellence support the development of Estonian research so as to	
2013)	strengthen Estonian competitiveness at European level. Currently, there are 12 Cent	
	of Excellence in Estonia:	
	1. Frontiers in Biodiversity Research;	
	2. Centre of Excellence in Genomics;	
	3. Centre of Excellence for Translational Medicine;	
	4. Centre of Excellence in Computer Science;	
	5. Centre of Excellence in Chemical Biology;	
	6. Centre of Excellence in Cultural Theory;	
	7. Centre for Integrated Electronic Systems and Biomedical Engineering;	

<sup>&</sup>lt;sup>16</sup> Transferable skills are the skills that can be used chosen by a student, regardless of his/her specific field of study.

<sup>&</sup>lt;sup>17</sup> Adopted on 11 June 2003; renewed on 8 September 2011. Available at: <a href="http://www.ern.ee/images/dokumendid/kvaliteedilepe/allkirjastastud">http://www.ern.ee/images/dokumendid/kvaliteedilepe/allkirjastastud</a> head tavad.pdf (in Estonian).

Measure	Description
	<ol> <li>Centre of Excellences in Frontiers in Biodiversity Research;</li> <li>Centre of Excellence in Environmental Adaptation;</li> <li>Mesosystems – Theory and Applications;</li> <li>Centre of Excellence High-Technology Materials for Sustainable Development;</li> <li>Centre for Nonlinear Studies.</li> </ol> The Centres are financed by the European Regional Development Fund. During the
ERMOS Programme (Estonian Research Mobility Scheme) (2007-2013)	period 2007-13, nearly EUR 49.02 million is being allocated to the Centres of Excellence. The ERMOS Programme aims to develop and diversify Estonian research potential through the mobility of researchers and the development of young researchers' careers. The Programme is implemented by the Estonian Research Council. It is financed by the Marie Curie COFUND under the People strand of FP7. The duration of the postdoctoral grant is two or three years. The total budget is 4.6 million.
The Mobilitas researcher mobility programme (2008- 2015)	The Mobilitas researcher mobility programme helps fund postdoctoral researchers and top-performing researchers to carry out research in Estonia or abroad:  - Post-doctoral grants (two to three years duration) are open to incoming post-doctoral researchers and to Estonian post-doctoral researchers going abroad;  - Top-performing researchers are financed (for three to five years) to come from abroad to work in an Estonian R&D institution.  The prime objective of the programme is to activate an international exchange of researchers and to foster knowledge transfer. The Programme is implemented by the Estonian Research Council. The Programme's total budget amounts to EUR 20.3 million, of which up to 85% is granted by the European Social Fund. State funding is no less than 10% and self-financing of the partners (Estonian R&D institutions) is at least 5%.

#### Remuneration

In order to In order to increase researchers' salaries, all State budget-financing instruments related to researchers' salaries were increased by 30% in the 2008 budget. However, the 2009 economic downturn has led to salary cutbacks in the research sector.

R&D personnel in enterprises are younger and better paid. The enterprise sector differs substantially from the non-profit sectors in terms of the average age of the researchers employed; the average age of researchers in the enterprise sector was 40 years old in 2010, compared to 46 years old in the non-profit sectors. To some extent, the preference for youth is explained by the difference in the labour costs per person-year devoted to R&D. In the enterprise sector, these labour costs increased from EUR 24 000 in 2009 to EUR 26 800 in 2010. In the non-profit sectors, the rise was from EUR 15 200 to EUR 17 200, so the one third differential persisted. <sup>18</sup>

For further information, see the new country profile on remuneration of researchers from the MORE2 study (forthcoming, on the EURAXESS website).

#### Researchers' Statute

The Estonian Government does not promote a concrete researcher's 'statute'. Universities are not obliged to hire doctoral students as research fellows. However, doctoral students can work in universities as an early-stage researcher or a lecturer's assistant and at the same time they still have student status and student benefits.

#### 'European Charter for Researchers' & 'Code of Conduct for the Recruitment of Researchers'

In September 2011, the Rectors' Conference, representing all universities in Estonia, signed an "Agreement on Good Practice". Point 10 of the Agreement refers to the implementation of the 'Charter & Code' 19.

In addition, in 2011, the Rectors' Conference participated in the second cohort of the European Commission Institutional Human Resources Strategy Group. The Estonian Research Council (previously Estonian Science

<sup>&</sup>lt;sup>18</sup> Statistical Yearbook of Estonia 2012. Statistics Estonia 2013: <a href="http://www.stat.ee/publication-download-pdf?publication-id=29873">http://www.stat.ee/publication-download-pdf?publication-id=29873</a>

<sup>19 &</sup>quot;Universities recognise the main principles of C&C. Universities will improve and strengthen their human resources in science following the general principles and requirements and values also in their future initiatives to develop a researcher career and an attractive, sustainable and open labour market"

Foundation) participates in the third cohort and four more R&D institutions in the fourth cohort. The Estonian Research Council is conducting a national gap analysis to be completed in the first half of 2013.

#### **Autonomy of institutions**

In Estonia, universities and R&D institutions enjoy high levels of autonomy over their personnel policies. Provisions on researchers' salaries and working conditions are covered by the Employment Contracts Act of 2008<sup>20</sup> as well as in the individual regulations of each university or R&D institution.

#### **Career development**

Under the Research and Development Organisation Act (1997)<sup>21</sup> and the Universities Act (1995)<sup>22</sup>, all regular teaching and research positions in R&D institutions are subject to public competition.

The table below provides an overview of teaching and research positions in Estonia.

Table 9: Teaching and research positions

Tea	aching positions	Research positions
_	Teacher	<ul> <li>Early-stage researcher<sup>23</sup></li> </ul>
_	Assistant	<ul><li>Researcher</li></ul>
_	Lecturer	<ul> <li>Senior Researcher</li> </ul>
_	Dotsent (Associate Professor)	<ul> <li>Leading Researcher</li> </ul>
_	Professor	
_	Professor Emeritus	

Source: Deloitte

Currently, professors are granted tenure if they have worked for the same university<sup>24</sup> and more than eleven years of experience as a professor have been evaluated by the University Council.

#### Shift from core to project-based funding

In Estonia, funding has shifted from core to project-based funding. Therefore, the funding is oriented towards supporting high-level R&D to guarantee the consistency and sustainability of a research field in Estonia.

The table below presents competitive and institutional funding instruments in the national R&D budget of the Estonian Ministry of Education and Research.

Table 10: National R&D budget allocation (2008-2012)<sup>25</sup>

	2008	2009	2010	2011	2012
Competitive (grants + targeted funding) EUR million	26.3	34.0	32.6	31.1	31.0
Institutional (base-line + infrastructure) EUR million	12.1	15.7	14.8	14.1	14.0

Source: from ERAC Peer-Review of the Estonian Research and Innovation System. Steady Progress Towards Knowledge Society (2012)<sup>26</sup>

The largest funding instruments are the institutional research funding and personal research funding. Institutional research funding enables R&D institutions to fund high-level research and development activities and to modernise and maintain the necessary infrastructure. Personal research funding is funding allocated for the research activities of individuals or research groups. Both instruments are competitively based.

#### Social security benefits (sickness, unemployment, old-age)

In Estonia, all researchers are considered as employees and are entitled to full social security coverage, including health insurance and sickness benefits. The Estonian Health Insurance Fund pays the benefit to the

<sup>&</sup>lt;sup>20</sup> Available at: <a href="http://www.sm.ee/fileadmin/meedia/Dokumendid/ASO/TLS/TLS">http://www.sm.ee/fileadmin/meedia/Dokumendid/ASO/TLS/TLS</a> ENG.pdf

<sup>&</sup>lt;sup>21</sup> Available at: http://www.enop.ee/tpi/digiope/Estonian%20Organisation%20of%20R&D%20Act%20204.pdf

<sup>&</sup>lt;sup>22</sup>Available at:

 $<sup>\</sup>underline{\text{http://www.legaltext.ee/en/andmebaas/tekst.asp?loc=text\&dok=X60039K4\&keel=en\&pg=1\&ptyyp=RT\&tyyp=X\&query=Universities+Acclearchers.}$ 

<sup>&</sup>lt;sup>23</sup> Including doctoral candidates; a Masters' degree is required

<sup>&</sup>lt;sup>24</sup> In total, 11 years in the same position

<sup>&</sup>lt;sup>25</sup> Source: Estonian Ministry of Education and Research

<sup>&</sup>lt;sup>26</sup> ERAC Peer-Review of the Estonian Research and Innovation System <a href="http://www.hm.ee/index.php?popup=download&id=11652">http://www.hm.ee/index.php?popup=download&id=11652</a>

insured person based on the certificate of incapacity for work. Benefits for temporary incapacity for work include sickness benefits, care allowance, maternity benefits and adoption allowance.

Doctoral candidates have access to health insurance, but are not eligible for sickness and unemployment benefits or pensions, unless they are hired by the university under an employment contract. In that case, they enjoy full social security coverage. Since 2012, the state has encouraged and supported universities in hiring doctoral students as early-stage researchers despite the fact that most of the doctoral candidates are already working, not necessarily as researchers, and receive full social security coverage as employees.

Under the Universities Act, students (including doctoral candidates) have the right to take a sabbatical of up to one year once at each academic level. In addition, students are granted the right to take additional academic leave (of up to two years) for health reasons. Students can interrupt their academic career (by up to one year) to serve in the Defence Forces and can take parental leave at any time up to the child's third birthday.

# 7. Collaboration between academia and industry

The research climate seems to be undergoing radical changes. Researchers are increasingly considered as "experts/consultants" by large companies (but not SMEs), which turn to universities as cooperation partners in the innovation processes. In 2010, more than 300 enterprises declared some intramural R&D expenditure. The actual number of enterprises and their situation is illustrated better by the fact that just 95 enterprises accounted for 90% of the enterprise sector's intramural R&D expenditure in 2010.

The Estonian Government is in the process of increasing the acquisition of knowledge with application value in universities and R&D institutions, and simultaneously increasing the private sector's demand for R&D.

The following table summarises programmes designed to develop (more) partnerships between industry and academia, and to foster doctoral training in cooperation with industry.

Table 11: Collaboration between academia and industry

Measure	Description
Ajujaht Business plan competition (ongoing)	Ajujaht (Brainhunt) is a start-up competition for young entrepreneurs creating innovative businesses. The competition aims at promoting an entrepreneuricy mindset and creating incentives for Estonian businesses. The competition is open to teams of 1-7 members of which 50% must have Estonian residency and be aged 17-35. The development programme concludes with the submission of business plans. The jury evaluates both business plans and presentations. The best plans share if the prize fund of EUR 95 000 and have the possibility of entering a one-year support programme for execution of their business plan. The competition has its own T show. During the 2010-11 competition, five representatives of successful teams had the opportunity to participate in an international seminar at the MIT Global Startu Workshop. The competition is carried out under the Enterprise Estonia awareness programme co-funded by the European Social fund. The total budget is between EUR 500 000 and 850 000.
DoRa Doctoral Studies and Internationalisation Programme, Activity 3 Training doctoral students in cooperation with businesses (2008-2015)	Activity 3 of the "DoRa" Programme - Training doctoral students in cooperation with businesses – actively assists innovative companies by funding the creation of doctoral student places. In order to be admitted to the programme as a partne businesses must be engaged in a development activity with solid application prospects. In addition, companies must show willingness to conclude a employment contract with the doctoral student while paying at least the leginal minimum wage.
	Partner universities must find a suitable partner and are responsible for the qualit and progress of the studies. Eligible expenditures include the student's tuition fee a monthly stipend and the remuneration of the student's co-supervisor at the company. Supported places are funded on the same terms as those applying the doctoral studies under the Estonian funding scheme for government-funder provision of higher education.
	The programme fosters development in the priority areas specified in Estonia' national RD&I strategy (i.e. information and communication technology, materia technology, environmental technology, biotechnology, power engineering an

Measure	Description
	health). Eligible partners are Estonian universities offering accredited PhD programmes in the priority areas. The programme is funded by European Structural Fund. The total budget is EUR 33.5 million.
Innovation Voucher Grants (2007-2013)	Innovation Voucher Grants aim to boost the competitiveness of Estonian SMEs through knowledge and technology transfer, expanding cooperation with R&D institutions and increasing the capability to protect intellectual property rights (IPR). Grants up to EUR 4 000 are provided to entrepreneurs for the procurement of innovation services. The total budget is EUR 2.9 million.
Joint activities of Ministry of Economics and Communication and Ministry of Education and Research (2009-2013)	The activities include:  - Supporting the development of entrepreneurship;  - Introducing economics courses and modules for students of non-business studies, followed by updating curricula in higher education institutions (prioritising science and engineering);  - Increasing funding for the above-mentioned courses;  - Providing opportunities for teaching personnel to refresh their competencies;  - Launching mobility schemes to facilitate two-way movement between academia and enterprises;  - Developing a joint Technology Management programme at Tallinn University of Technology and the University of Tartu to support students while testing their business ideas.
Product Development Grants (ongoing)	Product Development Grants are available to entrepreneurs and universities in support of the development of products and services with high added-value. Grants are provided for the preparation of product development or applied research.
SPINNO Programme (2007- 2013)	The SPINNO Programme was launched by the Ministry for Economic Affairs and Communications to promote cooperation between research and development institutions and enterprises. It also supports knowledge- and technology transfer in Estonian research institutions. The programme is co-financed by the European Union Structural Funds through Enterprise Estonia <sup>27</sup> . The total budget is EUR 7.7 million.
Technology Competence Centre Grants (2007-2013)	Technology Competence Centre grants aim to increase Estonia's international competitiveness by strengthening cooperation between entrepreneurs and research establishments in line with the Knowledge-Based Estonia Strategy. Grants are cofinanced by the European Regional Development Fund. (Total budget: EUR 62.9 million.)

# 8. Mobility and international attractiveness

In 2010, the percentage of doctoral candidates (ISCED 6) who were citizens of another EU-27 Member State was 5.2% in Estonia compared to 17.8% among the Innovation Union reference group and an EU average of 7.8%<sup>28</sup>. In the same year, non-EU doctoral candidates were 1.5% of all doctoral candidates in Estonia compared with 16.4% among the Innovation Union reference group and an EU average of 20.0%.

In academic year 2012-13, there are approximately 1 900 foreign degree students studying in Estonia which is 2.9% of all students (plus more than 1 000 Erasmus exchange students and more than 500 participants in the summer and winter schools). Compared to the previous academic year 2011-12, the number of foreign degree students has grown by 300 (and compared to 2010-11 by 600 and 2009-10 by 800). The number of foreign students has increased at every educational level. At the doctoral level, the percentage of foreign students was 5.8% in 2010-11, 6.5% in 2011-12 and 7.2% in 2012-13<sup>29</sup>. If this growth continues, it will be possible to achieve the goal set in the Estonian higher education internationalisation strategy of 2,000 foreign students by the year 2015.

This continuous increase reflects the implementation of various programmes encouraging the growth in the number of foreign students as well as the positive feedback on Estonian education and the learning environment from foreign students who have already studied in Estonia. According to the international

<sup>&</sup>lt;sup>27</sup> Enterprise Estonia (EAS), which was established in 2000, promotes business and regional development in Estonia. EAS is one of the largest institutions within the national support system for entrepreneurship, providing financial assistance, advisory, cooperation opportunities and training for entrepreneurs, research establishments, public and third sector

<sup>&</sup>lt;sup>28</sup> See Figure 1 "Key indicators – Estonia"

 $<sup>^{29}</sup>$  Compared to 3.1% in 2006-07, 2.9% in 2007-08, 2.9% in 2008-09, 5.1% in 2009-10.

iGraduate survey<sup>30</sup> (2012), 90% of foreign students studying in Estonia are satisfied with their studies in Estonia. They consider Estonia to be a safe and good place to live. They are also satisfied with the prices and leisure activities, and with the support services for international students, while only the difficulty in finding a job during their studies is a source of dissatisfaction.

The number of foreign researches working in Estonia has increased from 58 (from 19 foreign countries) in 2004 to 295 (from 51 foreign countries) in 2011. Estonia attracts researchers from a large variety of different countries. In most cases there are only 1–2 researches per country, however, more than one third of the researchers come from three countries: Germany, Russia and Finland (13.6%, 11.2% and 10.8% respectively).

#### Measures aimed at attracting and retaining 'leading' national, EU and third country researchers

The table below summarises key measures aimed at attracting and retaining leading national, EU and third-country researchers.

Table 12: Measures to attract and retain leading researchers

Measure	Description	
ERMOS programme	See chapter 6 "Working conditions".	
Mobilitas programme	See chapter 6 "Working conditions".	
The DoRa Doctoral Studies and Internationalisation Programme (2008-15)	The programme <sup>31</sup> targets master and doctoral students as well as academic staff already working or studying at Estonian higher education institutions or planning to do so. DoRa aims to enhance Estonia's capacity to employ highly qualified specialists from abroad, or train them in Estonia, and thus improve Estonia's overall capability in the field of research and innovation. The total cost of the programme is of EUR 33.5 million for the period 01.01.2008–31.05.2015; the support is divided into support from the European Social Fund up to 73% (EUR 24.6 million), state financing 9% (EUR 2.9 million) and self-financing of partners 18% (EUR 6 million). The key relevant activities are:  - Activity 2: Improve the quality of higher education by supporting the employment of international teaching staff. In 2008, the programme supported HEI's in hiring highly skilled international teaching staff for a long-term period up to 5 years. As of 2012, it is supporting the HEIs in hiring highly skilled international teaching staff for short periods of between 1-10 months and allowing for a maximum of two visits per person;  - Activity 4 <sup>32</sup> : Expand the pool of specialists holding PhDs by supporting the enrolment of talented international students in the doctoral programmes of Estonian universities. Eligible expenses covered by the programme are a monthly grant, a fixed travel grant, a grant to cover the cost of health insurance and a mobility allowance per year.  - Activity 5: Facilitate international research cooperation by supporting short-term research projects of visiting doctoral students in Estonia (up to 1-10 months and two visits per person maximum). Eligible expenses are a monthly living allowance, an additional grant to cover health insurance and an additional fixed travel grant <sup>33</sup> .  - Activity 9: Support for international students' master's studies in Estonia (stipendium per year) <sup>34</sup> .	
Source: Deloitte	See also chapter 7 "Collaboration between academia and industry".	

In Estonia, the main obstacles to researcher mobility have been identified as:

- Remuneration; and

**Inward mobility (funding)** 

 Difficulties in obtaining an Estonian visa/residence permit from countries where Estonia does not have representation.

<sup>&</sup>lt;sup>30</sup> Available at: http://www.i-graduate.org/

<sup>&</sup>lt;sup>31</sup> Available at: http://www2.archimedes.ee/amk/File/DoRa/2010 DoRa ENG.pdf

 $<sup>{}^{32}\,\</sup>text{Available at:}\,\underline{\text{http://www.studyinestonia.ee/study/scholarships/international-phd-students/phd-programme}}\\$ 

<sup>33</sup> Available at: http://www.studyinestonia.ee/study/scholarships/international-phd-students/visiting-phd-students

<sup>&</sup>lt;sup>34</sup> Available at: http://www.studyinestonia.ee/study/scholarships/international-master-students

The Estonian Government offers university students, researchers or lecturers a variety of scholarships for studying and carrying out research at Estonian public universities and institutions (e.g. the DoRa Programme, the Mobilitas Researcher Mobility Programme, the ERMOS programme).

Most Estonian institutions have concluded agreements with foreign higher education institutions and promote scholarships for international degree programmes. Researchers are also able to opt for other international scholarships (e.g. Compatriots' scholarships<sup>35</sup>, Erasmus, Erasmus Mundus, international companies' grants, etc.).

#### **Outbound mobility**

The table below summarises key measures encouraging researchers to spend some time in another country.

Table 13: Measures supporting researchers' outbound mobility

Measure	Description
DoRa Doctoral Studies and Internationalisation Programme (2008-15)	<ul> <li>The Programme targets Master and doctoral students and academic staff who are already working or studying at Estonian higher education institutions or are planning to do so:         <ul> <li>Activity 2: Encouraging short-term visits for out-going Estonian teaching staff for 1-6 months (eligible expenditures include a salary, travel expenses and a relocation allowance);</li> <li>Activity 6: Developing international cooperation networks by supporting the mobility of Estonian doctoral students for 1-5 months (eligible expenses are living allowance, a travel grant);</li> <li>Activity 7: Strengthening the international dimension in higher education by supporting the mobility of Master's students for 1-6 months(eligible expenses are a living allowance and a travel grant); and</li> <li>Activity 8: Supporting the participation of young researchers in the international exchange of knowledge for 3-21 days (eligible expenses are participation fee, travel expenses, living allowance, grant to cover accommodation).</li> </ul> </li> </ul>
Kristjan Jaagu stipendiumid (ongoing)	The programme targets Master's and doctoral students to support them in making research trips to foreign universities.
Researcher mobility programme Mobilitas (2008-15)	See chapter 6 "Working conditions".

Source: Deloitte

#### Promotion of 'dual careers'

The University of Tartu is a partner in the EURAXESS TANDEM project "Talent and extended mobility in the European Innovation Union" The two-year project (1 October 2012 - 30 September 2014) will focus on combining Dual Career and Recruiting offices, and EURAXESS Service Centres. The team members from four different academic institutions in Europe will strengthen EURAXESS Service Centres' activities by adding a complementary focus on dual career and integration aspects. TANDEM will:

- Analyse the basic requirements for the successful implementation of Dual Career and Integration Initiatives;
- Develop a systematic and modular approach to these services; and
- Place a special focus on 'brain circulation' and how Dual Career and Integration Initiatives could influence this positively.

#### Portability of national grants

The Estonian Research Council has adhered to the EUROHORCs Money Follows Researcher Letter of Intent and has agreed to finance research carried out in foreign institutes after it has been initiated in an Estonian R&D institution. Grant holders can apply to transfer their research grants only if the host country institution of has also signed up to the Letter of Intent.

<sup>35</sup> Compatriots' scholarships support the studies of young expatriate Estonians in Estonia's public universities, national institutions of applied higher education and vocational education centres

<sup>&</sup>lt;sup>36</sup> Available at: <a href="http://www.euraxess-tandem.eu/">http://www.euraxess-tandem.eu/</a>

# Access to cross-border grants

The Estonian Research Council awards institutional and personal research funding. Grant competitions are open to all permanent residents of the Republic of Estonia and citizens of a foreign country. Grants should be applied for through an Estonian Institution.