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Researchers' Report 2014

Country Profile: Hungary



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1. Key data

National R&D intensity target

“In the 2011 National Reform Programme, the Hungarian government set an R&D intensity target for 2020 of 1.8%. Hungary had an R&D intensity of 1.21% in 2011, up from 1.16% in 2010¹. An intermediary target of 1.5% by 2015 is set by the Science and Innovation Programme (as a part of the broader New Széchenyi Plan of January 2011). In 2010, 39.9% of total R&D expenditure (close to the EU average) was financed by government and 47.4% was financed by the business enterprise sector.

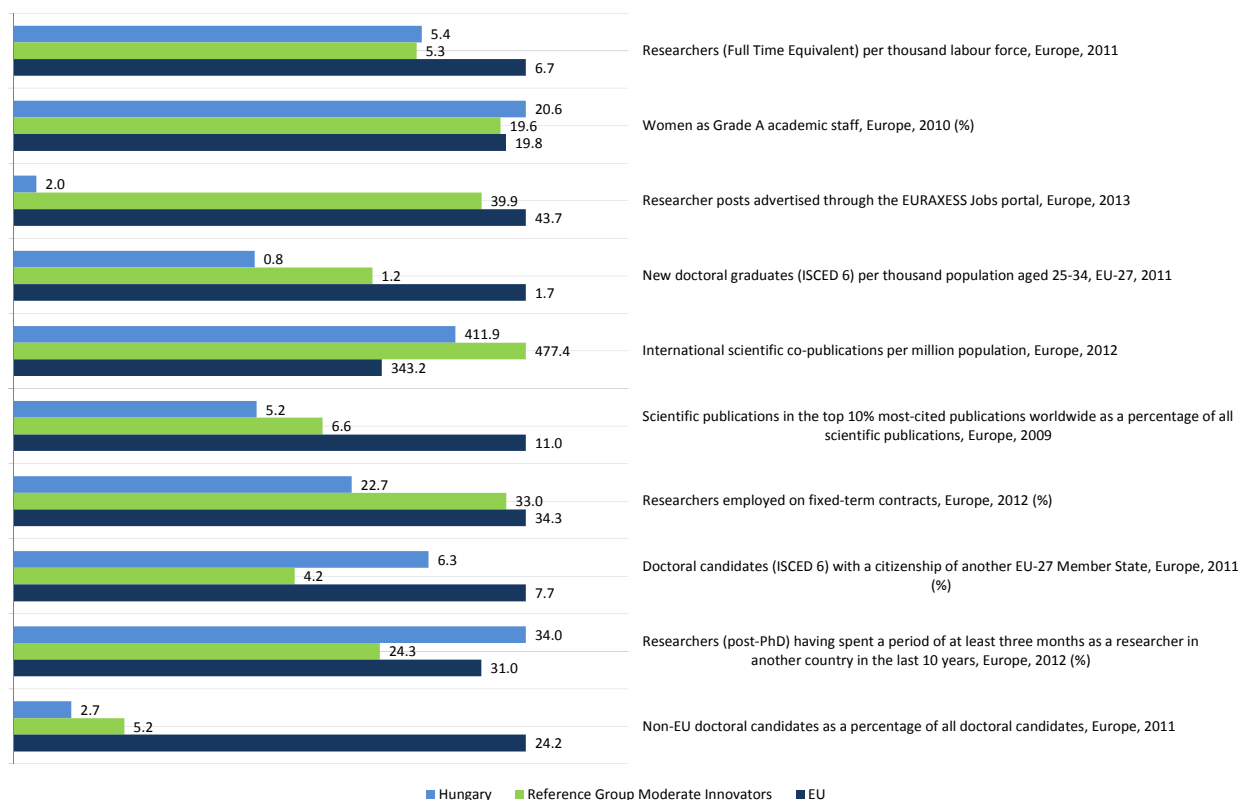
This last figure reflects the increase in business R&D intensity from 0.41% in 2005 to 0.69% in 2010. In Hungary, inward business investment in R&D as a % of total BERD decreased between 2003 and 2007 in contrast to the majority of European countries where internationalisation of R&D increased over the same period. However, the actual amount of inward business investment in R&D increased in nominal terms. Hungary has by far the highest ratio of inward FDI to GDP but only an average inward business investment in R&D intensity. Hungary, Spain and to a lesser extent Italy all suffered declines in intensity of inward investment in R&D over the period 1998-2007 (the latest period for which data are available).

Hungary has had a participant success rate of 20.4% in FP7 close to the EU average of 21.5%, and received more than EUR 114 million for 681 Hungarian participations in FP7 up to mid-2011. Hungary plans to invest EUR 2.16 billion of Structural Funds (2007-2013) in R&D and innovation, in particular in the regional growth poles with emphasis on enhancing R&D capacities.”²

Key indicators measuring the country’s research performance

The figure below presents key indicators measuring Hungary’s performance on aspects of an open labour market for researchers against a reference group and the EU average³.

Figure 1: Key indicators – Hungary



¹ In 2012, R&D expenditure was 1.3% (Eurostat, 2014).

²European Commission (2013), “Research and Innovation performance in EU Member States and Associated countries. Innovation Union progress at country level 2013”

³ The values refer to 2013 or the latest year available

Source: Deloitte

Data: Eurostat, SHE Figures, EURAXESS Jobs Portal, UNESCO OECD Eurostat education survey, Innovation Union Scoreboard 2014, MORE2. Notes: Based on their average innovation performance across 25 indicators, Croatia, Czech Republic, Greece, Hungary, Italy, Lithuania, Malta, Poland, Portugal, Slovakia and Spain show a performance below that of the EU average. These countries are “Moderate innovators”⁴.

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	Hungary	EU Average/Total
Head Count per 1 000 active labour force (2011)	8.63	10.55
Head Count (2011)	36 945	2 545 346
FTE per 1 000 active labour force (2011)	5.38	6.75
Full time equivalent (FTE) (2011)	23 019	1 628 127

Source: Deloitte

Data: Eurostat

2. National strategies

The Hungarian Government has adopted a package of measures aimed at training enough researchers to meet its R&D targets 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 Hungary’s R&D targets, to promote attractive working conditions, and to address gender and dual career aspects.

Table 2: National strategies

Measure	Description
Act on Higher Education (Act CCIV of 2011)	<p>The new Higher Education Law was approved by the Parliament on 23 December 2011 and took effect at the beginning of 2012. The regulations of Act CCIV of 2011 (XII. 30.) on National Higher Education provide a legal framework for modernising the Hungarian higher education sector. The Higher Education Law focuses on two objectives:</p> <ul style="list-style-type: none"> – The definition of new priorities for science and education (i.e. more emphasis on science and technology), – Ranking of institutions by grade of excellence, through which the government intends to allocate scientific research incentives mainly to one fifth of HEIs, while the others are to be engaged mainly in tuition. <p>A first step was taken in 2010 even before the law was passed, when five universities were defined as “research-intensive universities”: the Budapest University of Technology and Economics, Eötvös Loránd University, Semmelweis University, the University of Debrecen and the University of Szeged.</p> <p>In the framework of the new Higher Education Law, in addition to the five research-intensive universities, seven were classified as excellent universities: Corvinus University of Budapest, Szent István University, University of Miskolc, University of Pannonia and University of Pécs.</p>
Investing in the Future – National Research and Development, Innovation Strategy 2013-2020	<p>Following a consultation in 2013 on a draft of its proposals for Investing in the Future – National Research and Development, Innovation Strategy 2020, the Hungarian government has revised and updated its previous Science, Technology and Innovation (STI) Strategy (2007-2013) in order to find solutions to the three main problem areas within the national RDI system:</p> <ul style="list-style-type: none"> – The weaknesses of knowledge bases and knowledge production; – The shortcomings in knowledge flow, knowledge and technology transfer; – Obstacles to the (innovative) functioning of the business and community sectors involved in knowledge utilisation. <p>Support for research, development and innovation can be considered as a long-term investment in the future. The National Innovation Strategy aims to raise investments in R&D&I in Hungary, and as a result, to mobilise the national economy and strengthen its competitiveness. The strategy aims to raise R&D expenditure to 1.8 % of GDP by the end of the decade. In addition, it aims to create an environment in which public institutions,</p>

⁴ European Commission (2014), “Innovation Union Scoreboard 2014”

Measure	Description
	<p>companies and innovative enterprises can develop and grow. The strategy focuses on knowledge creation, knowledge transfer and knowledge utilisation. It deals with the whole business sector, including small enterprises, medium-sized firms and large companies. The strategy's key goals are to:</p> <ul style="list-style-type: none"> – Lift 30 research and technological laboratories to get into the world's elite; – Have 30 new global R&D centres bedded down; – Have 30 domestic medium-sized companies in the Central and Eastern European region; and – Help 300 fast growing small enterprises enter the international market successfully. <p>In addition, the strategy aims to create outstanding knowledge centres to train and nurture talents, to strengthen research sites (especially in the Hungarian Academy of Sciences and in higher education), to create internationally competitive research infrastructures and to foster modern research management. Specific measures envisaged to achieve these objectives include:</p> <ul style="list-style-type: none"> – Developing the National Talent Programme; – Strengthening higher education in the field of natural sciences and engineering to meet the demands of the labour market; – Providing training in complementary skills, such as innovation management, project management and IPR, etc.); – Creating a researcher life-path model; and – Promoting intersectoral mobility. <p>All these will contribute to delivering the next generation of excellent researchers, attracting world-class researchers to carry out research in Hungary and encouraging Hungarian researchers living abroad to return.</p>
<p>National Reform Programme 2013 (NRP 2013) of Hungary, based on the Széll Kálmán Plan (2011)</p>	<p>The main purpose of the National Reform Programme is to introduce measures for dynamic economic growth, boost employment, ensure a sustainable level of public debt, while following the guidance of the European Commission in the way it is structured and the content is presented. Most of the growth-enhancing measures are structured according to the priorities of the Annual Growth Survey, while measures directly aimed at the attainment of the national targets of the Europe 2020 Strategy are presented in thematic chapters. The document places particular emphasis on the implementation of measures from the 2011 Programme and the country-specific recommendations approved by the European Council in June 2011.</p> <p>In line with the Europe 2020 Strategy, Hungary's targets are:</p> <ul style="list-style-type: none"> – <i>Improving the competitiveness and global performance of the business sector</i> – the share of Hungarian R&D&I activities to Hungary's GDP will be increased to 1.8 per cent; – <i>Increasing the level of employment through economic development, employment, education and social inclusion policies, taking account of territorial disparities</i> – the achievement of a 75 per cent employment rate in Hungary (a commitment specified in NRP); – <i>Enhancing energy and resource efficiency</i> – reducing carbon dioxide emissions, improving energy efficiency and renewable energy production, and implementing national commitments (raising the rate of renewable energy consumption to 14.65 per cent, increasing energy efficiency by 10 per cent and reducing the emission of greenhouse gases by 10%); – <i>Tackling social and demographic challenges</i> – the share of people completing a higher education qualification should rise to 30.3 per cent in the 30-34 age group, the share of people with a primary school qualification at most is to fall to 10 per cent in the 18-24 age group, and the share of people living in poverty is to drop by 5%. – <i>Local and regional development aimed at promoting economic growth</i> – the improvement of the local economic potential of rural regions, and of relations between urban and rural areas, and urban networks. Since this is a horizontal regional objective, it promotes the achievement of all Europe 2020 objectives at the local level. <p>Policy priorities:</p> <ul style="list-style-type: none"> – Strategy policy documents (official documents, policy consultation papers, green or white papers, Operational Programmes of Structural Funds);

Measure	Description
	<ul style="list-style-type: none"> - Innovation Strategies; - Public Research Organisations; - R&D cooperation (joint projects, PPP with research institutes); - Support to sectoral innovation in manufacturing; - Support to innovation in services; - Support to innovative start-ups, SMEs (gazelles); - Support to the formulation of a favourable innovation climate.
Science Policy Strategy 2014-2020 (draft)	<p>The new science policy strategy will serve as a guideline for Science, Technology and Innovation development in the academic sphere (higher education institutions, state subsidised research institutions) for 2014-2020. It is due to be finalised in the second half of 2014.</p> <p>The science policy strategy focuses on the STI performance of the academic sector (higher education institutions and state-subsidised research institutions – The Hungarian Academy of Sciences). The main aims of the strategy are:</p> <ul style="list-style-type: none"> - Improving the funding system for basic research; - Improving the quality of human resources & talent support; - Renewing and improving research infrastructure; - Improving accessibility of scientific databases (strengthening the impact of Hungarian research); - International cooperation, participation in scientific networks; - Harmonising cooperation between industry and the academic sphere (strengthening the knowledge triangle); - Cross-cutting goal: <ul style="list-style-type: none"> • Active involvement of higher education institutions in the drafting and implementation of Smart Specialisation Strategies. <p>The new science policy strategy for 2014-2020 is currently being finalised after wide social consultation. The strategy is to be ratified in the second half of 2014, with implementation details yet to be worked out.</p>
Science, Technology and Innovation (STI) Strategy (2007-2013)	<p>The Hungarian Government adopted its mid-term STI Strategy in 2007. The general objective of the STI Strategy was to transform Hungary's economy into a knowledge- and innovation-driven economy in the medium term, and to ensure that Hungarian companies deploy competitive products and services on the international market. The priorities are to:</p> <ul style="list-style-type: none"> - Promote the culture of exploitation and appreciation of scientific research results; - Set up a quality-, performance- and exploitation-driven, efficient national innovation system; - Develop a creative, innovative and appreciated workforce, complying with the demands of a knowledge-based economy and society; - Create an economic and legal background to stimulate the generation and exploitation of knowledge; and - Promote Hungarian enterprises, products and services which are competitive on the global market.

Measure	Description
	This Strategy has been superseded by the Strategy for 2014-2020.
The New Széchenyi Plan (2011-2014)	<p>The New Széchenyi Plan is a national programme for economic recovery and progress. The dual objectives of the Plan, within the context of seven break-out points⁵, are to improve the competitiveness of Hungary and to create one million new jobs over ten years. The Plan aims to strengthen the international competitiveness⁶ of the Hungarian higher education system by increasing the level of R&D expenditure (both public and private) to 1.8% of GDP by 2020 (compared to 2010 levels of under 1%), while setting an intermediate target of 1.5% by 2015. The New Széchenyi Plan is based on open planning and cooperation with private companies. The goal is to make the economy more dynamic and ensure that economic growth in Hungary is among the best-in-class in the EU through innovation and the use of measures such as:</p> <ul style="list-style-type: none"> – Strengthening knowledge infrastructures (research institutes, universities); – Supporting innovative companies with high growth potential operating in the processing and service sectors; – Increasing the innovation and absorption capacity of SMEs; – Developing innovative clusters; – Accessing national and international knowledge sources, and markets necessary for innovation.

Source: Deloitte

3. Women in the research profession

Measures supporting women researchers in top-level positions

In 2010, the percentage of women grade A academic staff was 20.6% in Hungary compared with 19.6% among the Innovation Union reference group and the EU average of 19.8%⁷.

In Hungary, more women attend school, study in higher education and graduate from tertiary education than men. Women made up 55% of the total student population in higher education for the year 2012. The previous prevailing tendency of there to be more men than women in doctoral studies appears to have been reversed as women represented 56% of the total doctoral student population in 2012/13.

The Hungarian Government has introduced a number of measures to increase the proportion of women in high level positions in research, technology and innovation. The table below provides an overview of key initiatives supporting women in research professions.

Table 3: Women in the research profession - Key programmes and initiatives

Measure	Description
National Innovation Office – Woman in Science Association Cooperation Agreement (ongoing)	The Ministry of National Economy and the National Innovation Office held a roundtable discussion on the topic of women in science at the beginning of 2014. As a result of this event a Cooperation Agreement was signed by the National Innovation Office and the Woman in Science Association. The agreement stipulates that the parties will cooperate in examining the gender dimension to science and research.
The National Strategy for the Promotion of Gender Equality – Guidelines and Objectives 2010-2021 (2010) and first Action Plan (2010-2011)	<p>The National Strategy for the promotion of gender equality is the Hungarian Government's long-term development concept. Its objectives include:</p> <ul style="list-style-type: none"> – Accomplishing equal economic independence of women and men, closing the employment and pay gaps; – Facilitating the reconciliation of professional, private and family life; and – Facilitating the reduction of the imbalance between women and men in

⁵The seven break-out points of the New Széchenyi Plan:

1. Healing in Hungary – Health industry;
2. Renewal of Hungary – Development of green economy;
3. Home projects – Residential property policy;
4. Network economy – Development of business environment;
5. Knowledge economy - Science – Innovation – Growth;
6. Employment;
7. Transport – Transit Economy.

⁶There were two dedicated calls (between March-April 2011) under the New Széchenyi Plan designed to strengthen the competitiveness of the national higher education institutions in the international scientific “market”, and develop the training and vocational system, mainly in the natural sciences, engineering and computing.

⁷ See Figure 1 “Key indicators – Hungary”

Measure	Description
	political and economic decision-making, and in the sciences. Revision on the Strategy is under way.

Source: Deloitte

Measures to ensure a representative gender balance

The Hungarian Government does not have quotas to ensure a representative gender balance in any sector. However, under the National Strategy for the Promotion of Gender Equality – Guidelines and Objectives (2010-2021), the proportion of women in leading positions in both the public and private sectors should increase by one third by the end of the period, by making equal opportunities plans more pronounced.

Most Hungarian universities have developed general and non-exhaustive equality plans. Some universities have more developed plans, such as the Budapest University of Technology and Economics and the Óbuda University. They organise information sessions on engineering and informatics science for high school girls with the aim of increasing the numbers of female students and encouraging them to study in the departments where males dominate.

Parental leave

One of the long-term objectives of the Hungarian Academy of Sciences (HAS) is to create a platform and work environment where women and men who have children can work without stress and can carry out creative research. The Academy's Equal Opportunity Plan aims to improve the work-life balance of researchers by helping women with children. The initiative helps reconcile research and childcare responsibilities by extending the deadline for recent parents to apply for fellowships and grants (two additional years beyond the age limit). This initiative enables parents to stay at home with their children and then continue their career. The institutions directly involved are the 15 research institutes that are part of the HAS, and the 89 research groups co-financed by the HAS and the universities.

4. Open, transparent and merit-based recruitment

Recruitment system

In Hungary, publicly funded research jobs are published online on both the institutions' websites and private job sites.

Since 1 January 2008, open recruitment of civil servants has been required by law and institutions are obliged to publish all public research jobs on a central governmental recruitment site⁸. Most vacancies are still advertised internally as well.

Open recruitment in institutions

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

Table 4: Open recruitment in higher education and public research institutions

Do institutions in the country currently have policies to ...?	Yes/No	Description
– publish job vacancies on relevant national online platforms	Yes	Since January 1, 2008, there has been a legal obligation to recruit researchers who are public servants openly and to publish all public research jobs on a central government recruitment site (www.kozigallas.gov.hu).
– publish job vacancies on relevant Europe-wide online platforms (e.g. EURAXESS)	No	Institutions do not have policies in place to publish job vacancies on relevant Europe-wide online platforms.
– publish job vacancies in English	No	Institutions do not have policies in place to publish vacancies in English.
– systematically establish selection panels	No	Generally, institutions do not have policies in place to systematically establish selection panels.
– establish clear rules for the composition of selection panels (e.g.	No	Generally, institutions do not have policies in place to establish clear rules for the composition of selection

⁸ Available at: <https://kozigallas.gov.hu/pages/login.aspx?U=https%3a%2f%2fkozigallas.gov.hu%2fpages%2fhome.aspx>

Do institutions in the country currently have policies to ...?	Yes/No	Description
number and role of members, inclusion of foreign experts, gender balance, etc.)		panels.
– publish the composition of a selection panel (obliging the recruiting institution)	No	Institutions do not have policies in place to publish the composition of a selection panel.
– publish the selection criteria together with job advert	Yes	Institutions publish the selection criteria together with job advert.
– regulate a minimum time period between vacancy publication and the deadline for applying	Yes	In most cases, institutions regulate a 30-day period between vacancy publication and the deadline for applying.
– place the burden of proof on the employer to prove that the recruitment procedure was open and transparent	No	Institutions do not have policies in place placing the burden of proof on the employer to prove that the recruitment procedure was open and transparent.
– offer applicants the right to receive adequate feedback	Yes	Institutions have policies in place offering applicants the right to receive adequate feedback.
– offer applicants the right to appeal	Yes	Institutions have policies in place offering applicants the right to appeal.

Source: Deloitte

EURAXESS Services Network

In 2013, the number of researcher posts advertised through the EURAXESS Jobs portal per thousand researchers in the public sector was 2.0 in Croatia compared with 39.9 among the Innovation Union reference group and an EU average of 43.7⁹.

The Hungarian EURAXESS Office with its network of regional Contact Points is regarded as the major information source for mobile researchers on practical mobility-related issues. The network consists of 14 members covering Hungary.

In order to ensure up-to-date and high quality information, the EURAXESS Office is often involved in high-level stakeholder consultations on different issues relating to researcher mobility.

The Hungarian EURAXESS Office is responsible for both the promotion of the EURAXESS Jobs portal and providing assistance with the implementation of the 'Charter & Code' by higher education institutions.

5. Education and training

Measures to attract and train people to become researchers

The Hungarian Government believes researchers contribute to the competitiveness of the economy and regards them as the driving force of innovation. It has introduced several measures to attract and train young people to become innovative and creative researchers, including lifelong learning activities, improvement of doctoral schools, the establishment of a modern higher education system with a special focus on the fields of natural sciences and engineering, and strengthening the entrepreneurial spirit, the encouragement of industry-academia partnerships, and mobility and training programmes.

In order to raise young people's interest in pursuing a researcher career, the Hungarian Government has put in place the following initiatives:

Table 5: Programmes to attract young people to become researchers

Measure	Description
Hungarian Talent Programme (2008-2028)	The National Talent Programme was established by Parliamentary Resolution 126/2008. (XII. 4) with the aim of supporting and developing talented youth. The Programme is to contribute equally to career orientation and its success, to the stimulation and spread of innovation and creativity, to economic growth and to enhanced competitiveness. The main goals of the Programme are:

⁹ See Figure 1 "Key indicators – Hungary"

Measure	Description
	<ul style="list-style-type: none"> - Identification of talented youth; - Continuous support adapted to the nature and level of talent to maximise the latter; and - Promotion of talent utilisation. <p>The Programme spans 20 years and support talents from early childhood until the start of their career. It focuses on four different thematic directions, of which fostering scientific and innovative talent is one. In 2013, funding was provided to 72 national and transnational programmes, camps and workshops focusing on nurturing talents.</p>
Hungarian Academy of Science – Structural Reforms of the Research Network (ongoing)	<p>In 2011, as part of the first phase of the renewal programme, a new institutional structure was established by eliminating fragmentation while preserving the autonomy and scientific excellence of research institutions.</p> <p>The newly founded research centres will fulfil their public duties within economically sounder institutional frameworks in line with a more concentrated research strategy allowing for increased research potential.</p> <p>Key changes include:</p> <ul style="list-style-type: none"> - Funding individual excellence in order to give research teams gathering outstanding and talented researchers a key role in this new system; - Assessment of research institutions' performance goal attainment by international experts.
National Excellence Programme (ongoing)	<p>The National Excellence Programme launched in 2012 under the New Széchenyi Plan has two sub-programmes:</p> <ol style="list-style-type: none"> 1) Supporting excellent students, teachers and researchers; and 2) Campus Hungary Programme. <p>The first aims to encourage excellent educational and research activities resulting in significant impacts for the economy of the European Union. This Programme includes several sub-programmes:</p> <ul style="list-style-type: none"> - Magyary (including 10 types of fellowship): to support the training of excellent Hungarian undergraduates and postgraduates, early-stage and experienced researchers and to attract world-class researchers living abroad to work in Hungary and foster their integration; - Hungarians living abroad (including four types of fellowship): to support Hungarian undergraduate and PhD students as well as excellent researchers living in neighbouring countries; - Danube-Strategy (including five types of fellowship) to attract world class researchers to come and carry out research in Hungary; - Fellowships based on bilateral agreements (including three types of fellowship) to support talented undergraduates from Albania, the former Yugoslav Republic of Macedonia and Montenegro; - New Central Europe (including three types of fellowship) to support world-class researchers (both from Hungary and abroad) to involve them in the activities of Hungarian top-level research centres. <p>All fellowships aim to focus on scientific disciplines, e.g. natural sciences, engineering, mathematics and life sciences, to fulfil the Innovation Union commitments to increase the number of young people embarking on a scientific career.</p> <p>These sub-programmes funded the following number of fellows in 2013:</p> <ul style="list-style-type: none"> - Magyary: 1 638 - Hungarians living abroad: 39 - Danube-Strategy: 31 - Bilateral agreements: 7 - New Central Europe: 6. <p>The second programme aims to increase the involvement of Hungarian higher education in international mobility programmes. It provides outgoing mobility fellowships to MSc and PhD students to carry out scientific activities abroad. It also supports employees of higher-education institutions. In 2013, 3 366 MSc or PhD students and 1 083 HEI employees received funding.</p>

Source: Deloitte

Doctoral graduates by gender

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

Table 6: Doctoral graduates by gender

Indicator	Hungary	EU Average
New doctoral graduates (ISCED 6) per 1 000 population aged 25-34 (2011)	0.8	1.7
Graduates (ISCED 6) per 1 000 of the female population aged 25-34 (2011)	0.8	1.6
Graduates (ISCED 6) per 1 000 of the male population aged 25-34 (2011)	0.8	1.8

Source: Deloitte

Data: Eurostat

Funding of doctoral candidates

In 2013, 1 270 doctoral students received state-funded fellowships. Of these, 420 are studying social sciences (including humanities, theology) and 850 life sciences (including agricultural science, engineering, medical sciences, natural sciences and the arts).

As part of the National Excellence Programme (see above), two fellowships for doctoral candidates were introduced under the Magyary sub-programme: the János Apáczai Csere Fellowship and the Ányos Jedlik Fellowship. The former is for doctoral programme students; a total of 190 fellowships were awarded in 2013. The latter is for doctoral candidates; a total of 118 fellowships were awarded in 2013. There is also an opportunity for PhD students under the Andrassy Europe Fellowship scheme which is part of the Danube Strategy sub-programme. Three fellowships were awarded in 2013.

Measures to increase the quality of doctoral training

Hungarian universities develop and promote their own post-doctoral programmes financed by the State. When an education institution plans to introduce a new PhD curriculum, it needs the approval of the Hungarian Accreditation Committee. In 2013, there were 175 accredited doctoral schools in 27 universities in Hungary.

An increase in the quality of doctoral training was ensured by several programmes under the Development Plan (2007-2011) and the New Széchenyi Plan (2011-2014). These included the Research University Programme and the Hungarian Talent Programme). In addition, the Act on Higher Education (2005) further supported the strategic ambition of increasing the quality of doctoral training in Hungarian institutions. On 1 January 2012, a new Act on Higher Education came into force. The new Act on Higher Education (Act CCIV of 2011) further supports the strategic ambition of increasing the quality of doctoral training in Hungarian institutions by introducing a ranking and classification of higher-education institutions (see chapter 2 “National Strategies.”)

Moreover, several quality improvement regulations were adopted over the period 2012-2013. They included 387/2012. (XII.19.) Government Regulation on Doctoral Procedures and the Habilitation Decision of the Hungarian Accreditation Committee (HAC) at its meeting of June 7, 2013. As a consequence, the professional control of HAC has been strengthened, the funding and operating rules of doctoral schools have been tightened, and the professional monitoring of PhDs has been improved.

Skills agenda for researchers

In the new national RDI strategy, “Investing in the Future – National Research and Development, Innovation Strategy 2020” includes initiatives related to the improvement of researchers’ employment skills and competencies. These are:

- Strengthening higher education in the field of natural sciences and engineering to meet the demands of the labour market;
- Providing training in complementary skills, such as innovation management, project management and IPR, etc.);
- Creating a researcher life-path model;
- Promoting intersectoral mobility;
- Strengthening the entrepreneurial spirit in education; and
- Developing joint training programmes with companies.

The Government Regulation on National Excellence in Higher Education (24/2013. (II.5)) encompasses the following measures to enhance the skills and competencies of researchers, to train them to adapt to the needs and demands of the changing labour market, and to ensure the next generation of adequate, well-trained R&D human resources:

- Creating higher education entities of national excellence, such as distinguished higher education institutions, research universities, research faculties and colleges of applied science;
- Awarding fellowships to excellent students, researchers and teachers – mainly in the context of the National Excellence Programme; and
- Establishing institutions to foster talents.

6. Working conditions

Measures to improve researchers' funding opportunities

The table below summarises the measures taken by the Hungarian Government to improve researcher funding opportunities.

Table 7: Funding opportunities for researchers

Measure	Description
Grant Programme of the Richter Gedeon Centennial Foundation¹⁰ (ongoing)	This post-doctoral grant programme has been running for well over a decade – it was established in 2001. There are three options: <ul style="list-style-type: none"> – Grant for PhD students who have spent three years as publicly funded students in doctoral schools but did not complete their study. The duration is 3-12 months and it can be prolonged up to 12 months; – Support for PhD students during three-year doctoral studies related to medical research. This call is open to researchers from abroad but the documents must be submitted in Hungarian; – A programme for institutions in order to support their publication activities; and – Support for one to two cerebrospinal research projects.
Government Decree No. 3/2012 (I. 23) on Financing Higher Education Institutions	The State-funding of HEIs (normative funding) consists of: <ul style="list-style-type: none"> – For education: 35% (based on the number of students); – For student allowances: 29% (based on the number of students); – For scientific quality: 18% (based on formal indicators); – For infrastructure: 18%. <p>The State provides extra funding for selected research universities and will award special financial support for selected Priority Higher Education Institutions and Colleges for Applied Research.</p>
Human Resource Development Operational Programme (2014-2020)	The Human Resource Development Operational Programme (HRDOP) for 2014-2020 is to replace the Social Renewal Operational Programme (2007-2013) (the operational programme addressing human resource development with the help of the co-financing of the European Social Fund). It will also include measures to develop the educational, research and information technology infrastructure of higher education institutions to raise the standards of higher education activities.
Momentum (Lendület) Programme of the Hungarian Academy of Sciences (ongoing)	In 2009, the Hungarian Academy of Sciences announced the “Momentum Programme” to support outstanding young researchers. The objective of the Momentum Programme is a dynamic renewal of the research teams of the Academy and participating universities by attracting outstanding young researchers back to Hungary (see chapter 8 “Mobility and international attractiveness”).
OTKA - The Hungarian Scientific Research Fund (1986)	The Hungarian Scientific Research Fund (OTKA) has been the major funding agency for basic science and scholarship since 1986. OTKA administers calls for proposals with a bottom-up approach to research proposals, postdoctoral research proposals, and proposals for international cooperation. Without any thematic restrictions, its annual calls put special emphasis on the careers of talented young researchers and on the reintegration of Hungarian researchers returning from postdoctoral training or research projects carried out abroad. In addition, OTKA administers calls for proposals for the establishment of

¹⁰Available at: http://mta.hu/representatives_of_doctors/

Measure	Description
	scientific schools directed by internationally acknowledged scientists and for the development of libraries to provide research universities with the opportunity to purchase databases and full-text journals available on electronic media and various networks.
Social Renewal Operational Programme (TÁMOP) (2007-2013)	<p>The main objectives of the Social Renewal Operational Programme (TÁMOP) were to:</p> <ul style="list-style-type: none"> – Support complex research projects; – Develop management capacities for research projects carried out jointly by international innovative research teams of higher education institutions; – Connect internationally acknowledged researchers and their institutes to national research projects, in order to facilitate the national participation in different European Union programmes, such as the FP7 and Horizon 2020; – Reinforce co-operation with the business enterprise sector in R&D through the long-term financing of specific research fields, i.e. reinforce institutional co-operation with companies; – Offer candidate and young researchers the opportunity to take part in international research programmes. <p>The higher education development priority (SROP 4.1, 4.2) of the Programme implemented measures that contribute to fostering the supply of and participation in doctoral studies and postdoc training.</p> <p>SROP 4.2.2 was a measure aimed at supporting high quality research in dominant fields of research in Hungary. SROP 4.2.2C aimed to support research in the field of ICT. Both measures promoted the involvement of young doctoral students and young postdocs in high quality research projects, giving them an opportunity to participate in projects with international cooperation.</p> <p>Both measures were designed to support Hungarian participation in the future Horizon 2020 programmes. The fields of research mainly supported by the two SROP initiatives were the focal points of research in Horizon 2020, and this includes future emerging technologies.</p>
Social Infrastructure Operational Programme (2007-2013)	The Social Infrastructure Operational Programme (SIOP) aimed to develop the educational, research and information technology infrastructure of higher education institutions to raise the standards of higher education activities.
The Balassi Institute – the Hungarian Scholarship Board Office (Magyar Ösztöndíj Bizottság)	<p>The Hungarian Scholarship Board (HSB) Office provides university and research scholarships for an academic year and summer school scholarships:</p> <ul style="list-style-type: none"> – Scholarships for doctoral studies and partial doctoral studies; – Scholarships for postdoctoral studies; – Scholarships for postgraduate studies/research; – Scholarships for semester/partial studies (undergraduate and graduate level); and – Scholarships for summer courses.

Source: Deloitte

Remuneration

In Hungary, researchers' remuneration levels depend on the specific post-doctoral programmes they are enrolled in, including grants to spend some time as researchers in another country. The remuneration of researchers employed at higher educational institutions is based on a normative system. The funding comes from the central budget based on headcount. This is laid down by law. Researchers' salaries and career opportunities are regulated by Act XXIII (1992) on the Legal Status of Public Servants.

For further information, see the country profile on remuneration of researchers from the MORE2 study on the EURAXESS website.¹¹

¹¹ <http://ec.europa.eu/euraxess/index.cfm/services/researchPolicies>

Researchers' Statute

The researcher's statute is defined by:

- Act I (2012) on the Labour Code, establishing all rights and obligations of every person (citizen or foreign) working in Hungary;
- Act XXIII (1992) on the Legal Status of Public Servants, establishing researchers' salaries and career options at higher-education and other State institutions;
- Act CXXXIV (2004) on Research and Development and Technological Innovation, establishing the fundamental regulations for financing research and development and technological innovation activities in Hungary.

Hungarian laws and acts regulating employment conditions aim to reduce the bureaucratic obstacles for both national and non-Hungarian employees, and especially researchers coming from developing countries.

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

The Hungarian Government actively promotes the implementation of the 'Charter & Code' principles. Thirteen Hungarian institutions have signed the 'Charter & Code'. Promotion of the 'Charter & Code' as well as the R&D human resources strategy is an ongoing process, which involves both the Hungarian authorities and the Hungarian EURAXESS Office.

Autonomy of institutions

The state operates the higher education system and managing institutions provide oversight of operational conditions. Hungarian higher educational institutions enjoy full autonomy over which profiles of academic staff to employ and have the legal right to develop their own curricula and have them approved by their own institution's senate. This means autonomy in relation to science. Operational autonomy and management autonomy are ensured by the Constitution and Act CCIV on Higher Education (2011). This Act is designed to centralise higher education policy in order to harmonise it and avoid fragmentation.

The basic educational activity of the higher education system consists of: Bachelor (BA, BSc), Master (MSc), doctoral training, postgraduate training and higher-level vocational training. This is enshrined in Act CCIV on Higher Education (2011).

The Hungarian Academy of Sciences is also a self-governing establishment legally regulated by Act XL (1994) on the HAS. Differentiation of researchers' salaries at universities and research institutions must comply with Act XXIII (1992) on the Legal Status of Public Servants.

Career development

Hungarian higher educational institutions include career development provisions for post-doctoral students with the aim of supporting and encouraging them throughout their profession. For example, the Budapest University of Technology and Economics and the University of Miskolc (Northern Hungary) offer post-doctoral programmes with detailed career prospects. The Hungarian Academy of Sciences keeps a record of all of its 'Representatives of Doctors'¹² and remains in close contact with them.

In the "Investing in the Future" National Research and Development Innovation Strategy (2013-2020), Hungary's main objective is to increase the number of researchers from 38 000 to 56 000 by 2020. It is important to improve the quantity and the quality of doctoral training and to enhance the mobility of researchers across Hungarian universities and research institutes. The Scientific Policy Strategy (2014-2020) indicates that introducing performance-based pay and a category of fixed-term post-doctoral employment contracts could lead to a solution to the career problems of researchers.

Shift from core to project-based funding

The Act on Higher Education (Act CCIV of 2011, amending Act CXXXIX) regulates the project-based research funding system and its impacts on researchers' working conditions. The Act was adopted in December 2011.

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

In Hungary, researchers working under employment contracts are entitled to full social security benefits. PhD students, when receiving state fellowships, are not eligible for old-age benefits; they have to sign a specific contract with the Central Administration of National Pension Insurance individually if they wish to be covered for this period.

A new incentive to employment of researchers has been applied since January 1, 2013, in the form of reduced researcher-related contributions. A research-intensive company pays only a reduced tax contribution per researcher with a PhD up to a salary of HUF 500 000 (some EUR 1 670). The employer's social contribution tax which is 27% of the gross salary of the researcher is not payable in this case. Furthermore the employer is exempt from the 1.5% specialised professional training contribution for employees with a scientific title.

A maximum of HUF 50 million (some EUR 167 000) corporate tax base allowance can also be claimed back by companies who have contracts with public research institutes or by majority state-owned research institutes operating in the form of a business organisation for research and development activities.

It will mainly be innovative SMEs that will be able to get significant benefit from these measures.

7. Collaboration between academia and industry

In Hungary, there are R&D-intensive companies which have established close, long-lasting cooperation with universities and play an active role in undergraduate and PhD training.

The following table summarises key programmes designed to boost collaboration between academia and industry, and to foster doctoral training in cooperation with industry.

Table 8: Collaboration between academia and industry

Measure	Description
Dunaújváros College and Hankook Tire Hungary Ltd (ongoing)	Hankook Tire Hungary Ltd. and Dunaújváros College launched their joint Rubber Technology Engineer programme in Hungary in February 2009. In response to industry demand for technically trained personnel, this training provides engineers with theoretical and practical knowledge of tyre manufacturing. The training includes development, management, planning and diverse manufacturing technologies. While the theoretical part of the education takes place on the campus of the university, the practical training is always conducted directly in Hankook's state-of-the-art European factory. Highly qualified Hankook engineers set up the training programme and schedules, as well as being engaged as coaches in the practical seminars.
ERICSSON – BME, ELTE (ongoing)	Ericsson Telecommunications Hungary (ETH) has developed close collaboration with several departments at two major universities in Hungary: ELTE (Eotvos Lorand University) and BME (Budapest University of Technology and Economics). Students and their supervisors can work on industrially motivated problems mainly within MSc and PhD programmes. Ericsson also offers internships, where PhD students are contracted for a period of time, and they can work closely together with Ericsson researchers, mostly on Ericsson-internal or EU projects. These university cooperation schemes started about 20 years ago, and almost 80 PhDs have been completed since they started. Ericsson also actively takes part in education by giving lectures and providing help in working out the details of various subjects. In recent years, the collaboration has been significantly extended in the fields of software, hardware and microwave networks.
Human Resource Development Operational Programme (2014-2020)	The Human Resource Development Operational Program (HRDOP) (2014-2020) that is to replace the Social Renewal Operational Programme (2007-2013) (the operational programme addressing human resource development with the help of the co-financing of the European Social Fund), will also contain measures to promote inter-sectoral mobility of R&D personnel and will aim at strengthening knowledge-triangle-type co-operations. (See chapter 6 "Working conditions".)
Kecskemét College, Mercedes-Benz Manufacturing Hungary Ltd. and Knorr-Bremse Ltd (ongoing)	In 2011, a Memorandum of Understanding was signed among Kecskemét College (Faculty of Mechanical Engineering and Automation), Mercedes-Benz Hungary Ltd. and Knorr-Bremse Ltd. to establish dual vocational training at Kecskemét College, thus ensuring a highly qualified workforce in the field of mechanical engineering. During the practice-oriented training, students participate in "ordinary courses" at the College, but they are also trained at the partner companies: students are introduced to how theory works in practice. The first students in this new training programme commenced their studies in September 2012.

Measure	Description
	In addition, Mercedes-Benz is breaking new ground by offering high-grade dual vocational training based on the German model, which is being delivered in conjunction with Kecskemét City Council and the Chamber of Industry and Commerce of the county of Bács-Kiskun. The first 34 trainees started their courses in 2011. In the academic year 2013/2014, 44 students joined this training scheme.
Robert Bosch Department of Mechatronics – University of Miskolc¹³(ongoing)	The University of Miskolc and the Hungarian Bosch companies founded the Robert Bosch Department of Mechatronics in 2005. The target of the cooperation is to support practically oriented education and research activities in the engineering sciences, placing special emphasis on the wide range applications of mechatronics.
Social Renewal Operation Programme (2007-2013 & 2014) – 4.1.1./C, 4.2.2./A	The higher education development priority (SROP 4.1, 4.2) of the Social Renewal Operational Programme for the period 2007-2013 (with the measures continuing into 2014) implemented measures that contribute to the improvement of cooperation between the entrepreneurial sphere (industry) and higher education institutions. SROP 4.1.1C aimed at improving sectoral and regional cooperation at higher education institutions; SROP 4.2.2 A aimed at supporting high quality research in dominant fields of research in Hungary. Both measures promoted the importance of inter-sectoral cooperation. (See chapter 6 “Working conditions”).
Széchenyi István University and the Audi – Audi Hungary Department for Internal Combustion Engines¹⁴ (ongoing)	The Department was founded in 2007 with the aim of training highly qualified engineers in the field of internal combustion engines. Its main field of activity is engine mechanics and the tribology of internal combustion engines. The main focal points of this special higher education are its focus on practice, the development of capabilities beyond the profession and bilingualism. During their studies, the students regularly take part in Audi Hungaria research and development projects.

Source: Deloitte

8. Mobility and international attractiveness

In 2011, the percentage of doctoral candidates (ISCED 6) with citizenship of another EU-27 Member State was 6.3% in Hungary compared with 4.2% among the Innovation Union reference group and an EU average of 7.7%¹⁵. In the same year, the percentage of non-EU doctoral candidates as a percentage of all doctoral candidates was 2.7% in Hungary compared with 5.2% among the Innovation Union reference group and an EU average of 24.2%¹⁶.

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 to Hungary.

Table 9: Measures to attract and retain ‘leading’ national, EU and third country researchers

Measure	Description
Albert Szent-Györgyi Fellowships for Returning Post-Doc and Experienced Researchers (under the Magyar sub-programme of the National Excellence Programme) (ongoing)	The aim of these scholarships is to bring home excellent scientists living abroad and involve them in the scientific activities of higher education institutions. Seven postdoctoral fellows and six experienced researchers were awarded scholarships in 2013.
Andrássy Europe Fellowships for excellent early-stage and experienced researchers/lecturers, (Under the Danube Strategy Sub-Programme of the National Excellence	Three types of Andrásy Europe Fellowships aim at attracting either Hungarian or foreign researchers/lecturers with outstanding scientific achievements. The winners participate in the interdisciplinary training of the Andrásy University Budapest and in the research activities of the University’s Danube Institute. In 2013, four candidates were granted fellowships.

¹³Available at: <http://www.bosch.uni-miskolc.hu/index.php>

¹⁴Available at: <http://www.auditanszek.hu//index.php?nyid=hu>

¹⁵ See Figure 1 “Key indicators – Hungary”

¹⁶ Ibid

Measure	Description
Programme) (ongoing)	
János Neumann Fellowships for Early-stage and Experienced Foreign Researchers (under the Magyary sub-programme of the National Excellence Programme) (ongoing)	These fellowships aim to attract excellent, renowned early-stage and experienced researchers from abroad and engage them in the scientific activities of HEIs. Twelve early-stage and nine experienced researchers were funded in 2013.
János Szentágothai Fellowship Programme for Experienced Researchers (under the Magyary sub-programme of the National Excellence Programme) (ongoing)	The János Szentágothai Fellowship Programme supports renowned scientists having obtained their scientific degree more than 8 years ago. Seventy-one researchers were awarded this fellowship in 2013.
Momentum (Lendület) Programme of the Hungarian Academy of Sciences (ongoing)	<p>In 2009, the Hungarian Academy of Sciences announced the “Momentum Programme” to support outstanding young researchers. The objective of the Momentum Programme is dynamic renewal of the research teams of the Academy and participating universities by attracting outstanding young researchers back to Hungary. The impact and success of this application model is highly acclaimed and recognised even by the international scientific community. Initiated by HAS President József Pálinkás, the programme aims to stop the emigration of young researchers, provide a new supply of talented researchers, extend career possibilities, and increase the competitiveness of the HAS research institutes and participating universities.</p> <p>Thanks to Momentum, in 2013, 14 young scholars from among the 104 candidates were able to set up an independent research team using the total sum of HUF 633.7 million (some EUR 2.1 million) provided for the first years by the Academy. Consequently, together with the scholars who have previously received awards, 79 research teams have since the summer of 2013 been able to conduct research into promising internationally significant achievements of a total funding of nearly HUF 3 billion (some EUR 10 million). In keeping with the call for applications, the heads or research teams must raise funds from Hungarian and international competitive sources comparable to the support they receive from MTA for five years.</p>
New Central Europe Fellowships (under the New Central Europe sub-programme of the National Excellence Programme) (ongoing)	New Central Europe Fellowships (including three types of fellowship) aim to support world-class researchers (both from Hungary and abroad) to involve them in the activities of Hungarian top-level research centres. In 2013, six fellowships were awarded.
Pál Erdős Early-stage Researcher Fellowship (under the Magyary sub-programme of the National Excellence Programme) (ongoing)	This programme aims to support talented Hungarian early-stage researchers who obtained their scientific degree in the previous three years and are participating in a specific research project. They should be actively involved in the research activities of a Hungarian public or non-profit research organisation or higher education institution. The programme was launched very late in 2013 and the date for selection of the first candidates was March 2014.
The TRANSMOB-HU Programme - Hungarian support programme for improving the transnational mobility of researchers (2009-2014)	This Mobility Programme, co-financed by the EU 7th Framework Programme (Marie Curie actions), was designed to promote the scientific careers of experienced researchers with a PhD degree or at least four years of full-time research experience. The programme included support for the mobility and international training of researchers of any nationality, as well as for Hungarian researchers returning to Hungary. The call was open to every field of science; the main evaluation criterion was scientific excellence. The long-term contribution of the funded project to the career development of the researcher (the impact of the grant) was also regarded as key. The last call was published in 2010 and no new calls will be published, but some fellowships are still running. (Total budget: EUR 11.1 million.)
Zoltán Magyary Postdoctoral Fellowship Programme (under the Magyary sub-programme of the National Excellence Programme)	The Zoltán Magyary Fellowship Programme aims at supporting excellent Hungarian post-docs who have obtained their PhD in the previous eight years, are participating in a specific research project, and are actively involved in the research activities of a Hungarian public or non-profit research organisation or higher education institution.

Measure	Description
(ongoing)	

Source: Deloitte

Inward mobility (funding)

Hungary is regarded as open to researchers coming from abroad without legal or financial obstacles to researchers' mobility. However, settling down in Hungary might be difficult because of differences in bureaucracy compared to other EU countries. The Hungarian Government is focusing on providing more and better information to mobile researchers through the EURAXESS Office and its network of regional Contact Points.

A long-term visa or residence permit may be issued for the purpose of carrying out scientific research to third-country nationals in one of the following ways:

- The host research organisation signs an agreement with the non-national researchers for the purposes of carrying out a research project; or
- The research organisation provides a written commitment to reimburse the costs of expulsion in cases where the researcher remains on the territory of the Republic of Hungary past the period authorised – and if the researcher does not have the financial resources necessary for repatriation.

The Momentum and TransmobHU Programmes are the main programmes supporting researchers' inward mobility (see also table 9).

Outbound mobility

The TRANSMOB-HU - Hungarian support programme for improving the transnational mobility of researchers also supports researchers' outbound mobility (see table 9).

Promotion of 'dual careers'

The Hungarian Government does not directly promote measures supporting researchers' dual careers. However, a Ministerial Commissioner responsible for the improvement of the women's position in the labour market was appointed in 2013 and promotion of dual careers can be considered part of the remit.

Portability of national grants

Publicly funded grants or fellowships are not portable to other EU countries.

Access to cross-border grants

National grants are basically not open to students or researchers from other countries. However, several fellowships under the National Excellence Programme (see above under point 5) are targeted at excellent foreign researchers to attract them to Hungary.