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Researchers' Report 2014

Country Profile: Croatia



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1. Key data

National R&D intensity target

"In 2011 Croatia had an R&D intensity of 0.75% and a business R&D intensity of 0.33%. Croatia's R&D intensity decreased from 0.90% in 2008 to 0.75 % in 2011¹. This was mainly due to an overall slowdown of the national economy during the last four years, which was additionally affected by the global financial and economic crisis. Croatia did not meet its own national target of 1% by 2010. Accordingly, Croatia has opted to first reform the science system before setting new targets. Total R&D expenditure (GERD) which amounted to EUR 330 million in 2011 decreased by 3.2% between 2004 and 2011. Croatia's R&D intensity of 0.75% in 2011 was well below the EU average of 2.03% and has decreased at an average annual rate of 2.7% over the period 2002-2011.

Regarding EU funding, Croatia participates in FP7 as an associated country. It has a good level of participation (an average success rate close to 18%) which has amounted to about EUR 50 million of EU funding for Croatian research entities since the beginning of FP7. Croatia is particularly successful under the scientific themes in which it is also strong at national level i.e.: healthcare, ICT, biotechnology and transport. Participation of SMEs is also good: out of 225 applicants 57 (or more than 25%) were selected for funding. Croatia is a full member of the Eurostar initiative. Croatia is also a member of COST and EUREKA.

As a Candidate Country, and since December 2011, an Accession Country, Croatia is eligible for EU support under the Pre-Accession Instrument (IPA) and has used that instrument in support of research and innovation capacity building such as the creation of the Business Innovation Centre of Croatia (BRICO) which is a dedicated institution for the promotion of research and innovation in SMEs. The latter is a good demonstration that Croatia is concentrating its efforts on innovation and creating links between the public and private sectors. Croatia will become a member State on 1 July 2013 and will then have access to the Structural Funds and notably the European Regional Development Fund (ERDF) and the European Social Fund (ESF) for R&I capacity building purposes. BRICO will be the agency in charge of the competitiveness axis under the Structural Funds."²

Key indicators measuring the country's research performance

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

¹ In 2012, R&D expenditure was 0.75% (Eurostat, 2014).

² European 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.

Figure 1: Key indicators – Croatia



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	Croatia	EU Average/Total
Head Count per 1 000 active labour force (2011)	6.64	10.55
Head Count (2011)	11 454	2 545 346
FTE per 1 000 active labour force (2011)	3.97	6.75
Full time equivalent (FTE) (2011)	6 847	1 628 127

Source: Deloitte

Data: Eurostat

2. National strategies

The Government of the Republic of Croatia 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 Croatia’s R&D targets, to promote attractive working conditions, and to address gender and dual career issues.

Table 2: National strategies

Measure	Description
Act on Scientific Activity and Higher Education (2013 amendment)	This Act regulates the system of science and higher education. The most recent revisions to the Act brought many changes designed to reform the entire research system and increase its efficiency. The major changes included:

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

Measure	Description
	<ul style="list-style-type: none"> – Unification of the National Science Council and the National Council for Higher Education into the National Council for Science, Higher Education and Technological Development; – Measures to widen the selection process for postdocs, introduce promotion on the basis of merit rather than seniority and compulsory retirement of researchers at age 65; – Clearer definition of study programmes.
Action Plan for the Mobility of Researchers (2014-2016)	<p>The Action Plan for the Mobility of Researchers for the period 2014-16 is due to be issued in 2014. It will follow on from an Action Plan for 2011-12 prepared by the Committee for the Mobility of Researchers, and accepted and signed by the Minister of Science, Education and Sports in December 2010. This Action Plan ensured the continuance of actions planned and achieved under the Action Plan for the Mobility of Researchers 2009-2010. It was based on the Europe 2020 Flagship initiative. The Action Plan was based on the following structure:</p> <ol style="list-style-type: none"> 1. Recruitment of foreigners to scientific and scientific-educational positions; 2. Creation of better working conditions for researchers; 3. Streamlining the provision of temporary residence permits for the purpose of scientific research; 4. Further development of the infrastructure for the mobility of researchers; 5. Encouraging inter-sectoral mobility of researchers; 6. Development of researcher competencies. <p>It is expected for the New Action Plan for the Mobility of Researchers 2014-2016 to be published in 2014.</p>
Action Plan to raise the absorption capacity of Croatian participation in the Framework Programmes for Research of the European Union 2013-2015	<p>In 2013 the Ministry of Science, Education and Sports issued this Action plan to raise the absorption capacity of Croatian participation in the Framework Programmes for Research of the European Union 2013-2015. It contains measures that include all the essential aspects of implementation of the Framework Programme for Research of the EU – measures to improve administrative procedures and support in terms of helping scientists with their applications and project management, rewarding the successful application, and connecting project performance and scientific careers.</p>
Draft Strategy for Education, Science and Technology 2014-2020	<p>The Draft Strategy for Education, Science and Technology was prepared in 2013. It was developed by more than 60 Croatian scientists and experts. The Strategy was opened for public debate in September 2013. The final version is currently awaiting the Government and Parliament approval at the time of this report. This is the first comprehensive strategy at a national level since the Science and Technology Policy issued in 2006. One of the main goals of the Strategy is to create conditions for research and innovation focused on excellence in science, industrial leadership and societal challenges. It also aims to create conditions to provide high-quality education to all on equal terms and to enable science to contribute to job creation and socio-economic prosperity.</p>
Draft National Innovation Strategy of Republic of Croatia 2013-2020	<p>The National Innovation Strategy 2013-2020 will provide the reference framework/prerequisites for improving national innovation system management, enhancing cooperation between the science and business sectors, strengthening the innovation potential of the economy, strengthening human resources for innovation and first class research, and efficient organisation of legal and fiscal frameworks for innovation. The Strategy was opened for public debate in December 2013 by the Ministry of Economy. It is expected to be approved by Government and Parliament in 2014.</p>
Draft Research and Innovation Strategy for Smart Specialisation 2014-2020	<p>A Smart Specialisation Strategy is envisaged for the period 2014-2020. It will aim to identify the characteristics and assets of each region, highlighting their competitive advantages and rallying regional stakeholders and resources around an excellence-driven vision of their future. It is likely also to incorporate the strengthening of regional innovation systems, maximisation of knowledge flows and spreading the benefits of innovation throughout the entire regional economy.</p>
Draft Croatian Roadmap for Research and Innovation Infrastructure (2014-2016)	<p>A Croatian Roadmap for Research and Innovation Infrastructure is envisaged for 2014. It will come under the Ministry of Science, Education and Sports. Besides providing support for the implementation of the Strategy for Education, Science and Technology and the National Innovation Strategy, the purpose of this document is to identify research potential and the direction for further development of scientific research infrastructure in Croatia.</p>
Strategic Development Framework 2006-2013	<p>The Strategic Development Framework 2006-2013 (SDF) among others aimed to:</p> <ul style="list-style-type: none"> - Encourage research partnerships and strengthen grant systems for high

Measure	Description
	<p>quality early-stage-researchers – with the aim of facilitating mobility, interdisciplinary and inter-institutional cooperation as well as establishing a more flexible research and educational system;</p> <ul style="list-style-type: none"> - Establish a system of evaluation and reward adequately connected to scientific results and which should foster the personal responsibility of the scientist. This kind of system should also stimulate renewal of the research population; and - Provide legal and other conditions for the work of foreign researchers in Croatia, as well as conditions for participation of Croatian scientists in projects of domestic scientific research institutions abroad.
Science and Society Action Plan (2013)	<p>The main goal of this Action Plan issued by the Ministry of Science, Education and Sports is a systematic approach to science as a social value, to communication, promotion and affirmation of science in that context, to state and institutional policies of the affirmation of science in the society.</p> <p>Furthermore, the Action Plan promotes sex/gender equality in science, including:</p> <ul style="list-style-type: none"> - Rebalancing the gender ratio in the research system, especially in management structures (minimum 1/3 of women in national councils, regional councils, main committees, scientific and political bodies, etc.); - Programmes to offer opportunities to female scientists with the goal of increasing gender equality.

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 26.4% in Croatia compared with 19.6% among the Innovation Union reference group and an EU average of 19.8%.

According to the Ministry of Science, Education and Sports' 'Register of Scientists' the current percentage of women among active PhDs is 42.78%.

According to a country profile prepared for the use of the European Commission in 2012⁵, the college/university (tertiary education) attainment level of Croatian women was 15.3%, and was significantly lower than the EU-average (24.8%). Raising the female tertiary education attainment rate and motivating high school students to enter gender-atypical fields of study remains a challenge. The existence of "typically female" fields of education is notable in Croatia. Of all "teacher, training and education science" students, 93.2% are women while 75.1% of all "health and welfare" students are female. On the other hand, the share of women in "typically male" areas is much higher in Croatia than in the EU-27: women represent 50.6% of all students in "science, maths and computing" (EU average: 37.6%) and 28.7% in "engineering" (EU average: 25.0%).⁶

Numerous Croatian studies have pointed to a gender imbalance in some scientific fields and organisations, to professional inferiority of female researchers in scientific progress, acknowledgements and awards, under-representation of women in carrying out leading organisational as well as policy functions, and lower availability of material resources for women. This is recognised in the "Science and Society" Action Plan (see chapter 1 "National Strategies").

Since 2007, the Croatian UNESCO Committee, the Ministry of Culture and L'Oréal Adria have handed out yearly awards for Women in Science in an effort to raise the awareness of excellent young female scientists and reward them for their contribution. The award also encourages female students to pursue a career in the life sciences.

Gender equality and non-discrimination in research are included in the Constitution (Articles 14 and 15), the Act on Scientific Activity and Higher Education (Official Gazette (OG) 123/03, 198/03, 105/04, 174/04, 46/07,

⁵ According to "She Figures 2012 – Statistics and Indicators on Gender in Research and Innovation" published by DG Research & Innovation, the percentage of women educated in an S&T field and employed as professionals and technicians (HRSTC) as a percentage of those with tertiary education in an S&T field (HRSTE) is one of the highest in the EU-27 at 66.2%.

⁶ http://ec.europa.eu/justice/gender-equality/files/epo_campaign/country-profile_croatia_en.pdf

45/09, 63/11, 94/13, 139/13), the Labour Act (OG 149/09, 61/11, 82/12, 73/13), the Gender Equality Act (OG 82/08), the Act on Prohibition of Discrimination (OG 85/08, 112/12) and the National Policy for Gender Equality 2011-2015 (OG 88/11).

Parental leave

Under the Law on Maternity and Parental Benefits (OG 85/08, 110/08, 34/11, 54/13), all women are entitled to maternity benefits. A mother who is in full-time education is entitled to maternity leave from the date of the birth until the child is one year old on production of certification that she is in full-time education. Maternity leave is three years for the mothers of twins, and for the third and each subsequent child.

In accordance with Article 88 of the Act on Scientific Activity and Higher Education, students' obligations are dormant during pregnancy and up until the child is one. They exercise this right on the basis of the medical records of the pregnancy.

Mothers who are in full-time education have compulsory health insurance (Law on Maternity and Parental Benefits Act (OG 34/11)).

In the event of maternity leave, the Croatian Science Foundation allows candidates to postpone or pause research covered by the Foundation's fellowships/postdoctoral grants.

4. Open, transparent and merit-based recruitment

Recruitment system

Under the Act on Scientific Activity and Higher Education (Article 40), an appointment to a research position within public scientific research organisations must be based on a public competition, published in the Official Gazette of the Republic of Croatia, on the official internet website of the scientific research organisation as well as on the official Internet website for job vacancies of the European Research Area (i.e. the EURAXESS Jobs portal). The deadline for submission of applications has since Croatian accession to the EU been 30 days. Prior to Croatian accession, the period was eight days and it was at that time, but no longer is, legal to restrict recruitment to Croatian candidates.

Employment in all types of public institutions and public institutions of higher education is based on a public call so that equal access to public service employment for all citizens is guaranteed.

General requirements for appointment to a research position within public research organisations are election to a scientific title and registration in the 'Register of Scientists' (Article 41 of the Act on Scientific Activity and Higher Education). The criteria and procedure for appointment must be published in the Official Gazette, on the website of the institution and on the EURAXESS Jobs portal (Article 40 of the Act on Scientific Activity and Higher Education). The call is often advertised by the Croatian Employment Service as well. Research organisations may stipulate additional requirements for the appointment.

In scientific organisations, the term of appointment to scientific positions is five years (Articles 41 and 42 of the Act on Scientific Activity and Higher Education). Candidates appointed to scientific job positions conclude an employment contract. This contains an obligation to re-appoint or promote them every five years. Three months before the expiry of this five-year period, the competition for the same scientific position is announced by the scientific organisation. By special resolution of the Scientific Council of the institution, and with the consent of the employee, this may be announced earlier (one year before the expiry of the period, but no sooner than at the expiry of three years from the first selection to this scientific position). If another person is selected as a result, the employee who had previously worked in this position will be offered other suitable positions, or, if there are none, will start the process of termination of employment. If the employee fails to submit the application or is not selected because they do not fulfil the conditions, the procedure for termination of employment will begin without any obligation for the scientific institution to offer another appropriate scientific position.

Candidates elected to scientific or associate titles who work on a temporary scientific project may conclude employment contracts for the full or partial duration of the project.

Open recruitment in institutions

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

Table 3: Open recruitment in public higher education research institutions

Do institutions in the country currently have policies to ...?	Yes/No	Description
– publish job vacancies on relevant national online platforms	Yes	An appointment to a job position in a public research organisation must be carried on the institution's online platform; there is no national platform.
– publish job vacancies on relevant Europe-wide online platforms (e.g. EURAXESS)	Yes	This applies to public calls for all research job positions listed in the Act on Scientific Activity and Higher Education.
– publish job vacancies in English	Yes	When published on an international platform.
– systematically establish selection panels	Yes	The Act on Scientific Activity and Higher Education (art. 35) implies the establishment of selection panels.
– establish clear rules for the composition of selection panels (e.g. number and role of members, inclusion of foreign experts, gender balance, etc.)	-Yes	Under the Act on Scientific Activity and Higher Education (Art. 35), scientific organisations must appoint an expert committee within thirty days of the request for the appointment to a scientific position. The expert committee consists of at least three members who must hold the same or a higher scientific title as is required for the scientific position for which selection is being organised. Under the Act on Scientific Activity and Higher Education (Art. 40), foreign experts' opinions may be taken into consideration in the selection process. The "Science and Society" Action Plan (2013) promotes sex/gender equality in science, including these expert committees. Other details relating to the composition of selection panels are governed by the regulation applying to internal rules of the institutions.
– publish the composition of a selection panel (obliging the recruiting institution)	No	
– publish the selection criteria together with job advert	Yes	The selection criteria must be published together with the job advert.
– regulate a minimum time period between vacancy publication and the deadline for applying	Yes	30 days (Act on Scientific Activity and Higher Education).
– place the burden of proof on the employer to prove that the recruitment procedure was open and transparent	Yes	Institutions place the burden of proof on the employer for proving that the recruitment procedure was open and transparent.
– offer applicants the right to receive adequate feedback	Yes	The Act on Scientific Activity and Higher Education guarantees applicants the right to receive adequate feedback on the results of the competition within 15 days of the decision being reached. The Collective Agreement for Science and Institutions of Higher Education also gives the applicants the right to receive adequate feedback.
– offer applicants the right to appeal	Yes	Applicants have the right to appeal under the general rules regulating public competitions.

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 110.4 in Croatia compared with 39.9 among the Innovation Union reference group and an EU average of 43.7⁷.

⁷ See Figure 1 "Key indicators – Croatia".

EURAXESS HR contains information on entry conditions, transfer of social security and pension contributions, finding accommodation, administrative assistance, etc. (<http://www.euraxess.hr/>). Information on entry conditions is also available on the web pages of the Ministry of Interior (http://www.mup.hr/main.aspx?id=1266#Temporary_stay) and on the web pages of all Croatian embassies abroad.

In 2013, Croatian research organisations published 620 job vacancies on the EURAXESS Jobs portal and 167 research organisations from Croatia had registered for this activity. Advertising a large number of publicly funded research jobs on the central EURAXESS portal is felt to have increased the visibility of Croatian research organisations and has increased their prospects for international cooperation, joint research etc.

5. Education and training

Measures to attract and train people to become researchers

Each year the Ministry of Science, Education and Sports announces a public invitation for financial aid for programmes in the field of science popularisation. All organisations in the field of science have the right to apply (Article 22 of the Act on Scientific Activity and Higher Education and Constitutional Court Decision, 46/07th, 45/09th and 63/11, 94/13, 139/13), as do civil society organisations and NGOs registered under the Law on Associations (Official Gazette, No. 88/01.) and registered in the Register of Associations of Croatia (OG 11/02).

The areas of activity of programmes popularising science are:

- non-profit programmes and events that encourage public dialogue about science and science education;
- popularisation of science education for elementary and secondary schools;
- training of scientific and teaching staff for the popularisation of science and science education;
- public promotion of scientific methods and scientific excellence.

In 2012 the Ministry of Science awarded financial support to 18 programmes in the field of science popularisation in the total amount of some EUR 71 000 (HRK 545 611.89)⁸.

Doctoral graduates by gender

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

Table 4: Doctoral graduates by gender

Indicator	Croatia	EU Average
Graduates (ISCED 6) per 1 000 of the female population aged 25-34 (2010)	1.4	1.4
Graduates (ISCED 6) per 1 000 of the male population aged 25-34 (2010)	1.3	1.6

Source: Deloitte

Data: Eurostat, there are no data per gender available for 2011 for Croatia.

Funding of doctoral candidates

There are several streams of funding for financing doctoral studies:

- for research and teaching assistants, the costs of study are covered by the institution of employment where this is an HEI or PRO;
- the costs of study may be borne by the institution/company of employment;
- the cost of the study may be completely or partially covered by a scholarship (or a number of different scholarships); and
- the cost of the study can be a person's own responsibility.

Financing postgraduate studies through scholarships does not come under the jurisdiction of the Ministry of Science, Education and Sports. Scholarships are awarded by a wide range of institutions and organisations from all sectors of society - government, non-governmental and private. Among the most common are:

- Higher Education Institutions;

⁸ <http://public.mzos.hr/Default.aspx?art=12084&sec=2139>

- State or local government (government, ministries, counties/provinces, cities);
- International organisations;
- Foundations;
- NGOs;
- Private companies.

Measures to increase the quality of doctoral training

To ensure that doctoral programmes will be carried out successfully, the Act on Scientific Activity and Higher Education prescribes regular annual reporting and evaluation of research and teaching assistants in science and/or teaching, including by their mentors, as well as reporting upon success in postgraduate study. If the appraisal of an assistant is negative two times in a row, the procedure for termination of employment becomes effective. Scientific organisations evaluate the success of both the work of mentors and assistants every two years.

The University of Zagreb initiated a nationwide project in 2013 to provide all Croatian universities with HR programmes for sustainable skills development. The project is called Modernising Doctoral Education through Implementation of CROQF (Croatian Qualification Framework) and is coordinated by the University of Zagreb in cooperation with six partners; all Croatian public universities and 3 associated partners (Agency for Mobility and EU Programmes, Croatian Employment Service and Young Scientist Network – MLAZ). The overarching objective of the project is to enhance the implementation of the CROQF in the national doctoral education system as well as to develop and modernise doctoral students' qualifications during their doctoral studies by enhancing their professional and personal competences using CROQF standards. This project plans to collect data from the doctoral students of all Croatian universities on the level of their professional and personal competences, and data on employers' expectations about the necessary professional and personal competences of PhDs. The results will be processed and presented in the form of a study that will be used in the further implementation of the project (development of curriculum and guidelines for further work with doctoral students).

Skills agenda for researchers

The Ministry of Science, Education and Sports' Action plan for Mobility of Researchers 2011-2012 contained a chapter dedicated to the development of researcher competences, recognising that professional development and training programmes must be created with the goal of sharpening researcher competences in management, entrepreneurship, research, presentation, communication and administration. It is anticipated that the same will be acknowledged in the Action Plan for the Mobility of Researchers 2014-2016.

In 2009, the Doctoral Studies Rulebook of the University established a skills agenda for the development of additional skills as one of core elements of doctoral education and initiated specific programmes for transferable skills development in doctoral education. The University of Zagreb provides additional skills development on a continuing basis for doctoral candidates enrolled at the university.

The Central Office of Doctoral Studies and Programmes is in charge of providing the necessary tools for the implementation of a skills agenda, and supporting PhD candidates in developing transferable skills. Its aim is to develop communication, management and business skills that will allow PhD candidates to take advantage of their scientific potential during their doctoral training and later in the development of their academic and professional career. Since 2012, the University of Zagreb, in association with international experts has been organising workshops for PhD candidates (15-25 participants per workshop). The workshops are highly interactive and involve a minimum of lecturing with a maximum of group exercises, writing practice and communication within the teams.

In addition, the University of Zagreb is committed to raising awareness of the importance of the implementation of programmes for transferable skills development during doctoral education and to stressing the role of institutions in creating these programmes. To achieve this, a number of events were organised during 2013 (mainly in the form of conferences or open days), targeting all those included in the process of doctoral education, be they vice-deans for science, doctoral study directors, supervisors or research team managers.

In March 2012, the University of Zagreb Centre for research, development and technology transfer (CIRTT) organised its third annual Research and Innovation Month, holding eight workshops dedicated to intellectual

property management, innovation management and commercialisation, entrepreneurship and develop innovative companies. In 2012 CIRTT also organised six workshops dedicated to the 7th Framework Programme (FP7), preparing researchers in different fields for submitting successful project applications. In March 2013 the annual Research and Innovation Month was held in Zagreb with workshops dedicated managing innovation and technology transfer, funding innovative research and development as well as cooperation with the industrial sector. In March 2014, the annual Research and Innovation Month organised workshops dedicated to public relations, meetings of industry and researchers in areas such as nanotechnology, advanced materials and manufacturing.

The University of Rijeka in 2012 organised 37 different lectures and workshops for almost 1 500 participants with the goal of enhancing researchers' knowledge in development of entrepreneurial skills, preparation and management of projects funded by the EU and intellectual property rights. In 2013, the University of Rijeka Technology Transfer Office therefore organised several workshops and seminars on the importance of intellectual rights and technology and knowledge transfer for students and researchers.

The Science and Technology Park at the University of Rijeka is very active in organising workshops dedicated to transferable skills. These workshops are open to both SME's and researchers from the University of Rijeka. During 2012, the Science and Technology Park organised 18 workshops with 500 participants on topics such as project management, technology transfer, e-marketing etc.

The University of Split has a Technology Transfer Office (TTO) which aims to increase the commercialisation of University intellectual property and strengthen links between universities and industry. Among other activities, the Office provides support to researchers in all phases of the implementation of technology projects (the idea, invention, process, intellectual property protection, the establishment of enterprises and the commercialisation of intellectual property). Since 2012 this TTO has been organising an Intellectual Property Month with three workshops: a) Introduction to Intellectual Property, b) Patent Protection of the Invention and c) Patent Databases as a source of information.

6. Working conditions

Measures to improve researchers' funding opportunities

The following table summarises programmes designed to improve researchers' funding opportunities.

Table 5: Funding opportunities for researchers

Measure	Description
New International Mobility Fellowship Programme for Experienced Researchers in Croatia - NEWFELPRO (2013-2017)	The new International Fellowship Mobility Programme for Experienced Researchers in Croatia – NEWFELPRO is a fellowship project of the Government of the Republic of Croatia and the Ministry of Science, Education and Sports (MSES). The project is co-financed through the Marie Curie FP7-PEOPLE-2011-COFUND program. Its total value is EUR 7 million, of which 60% is financed from national sources. Eighty-three fellowships are available as part of the NEWFELPRO project. There are specific schemes for outgoing and incoming fellows, including diaspora Croatians returning to the country. In addition, under the reintegration fellowship scheme within this programme, a total of nine two-year fellowships will be awarded with a view to reversing the "brain drain".
Second Science and Technology Project (STP II) – 2014-2017	The Government of Croatia has received EUR 20 million EUR from the International Bank for Reconstruction and Development (IBRD) (World Bank) for the implementation of the Second Science and Technology Project (STP II) which was launched on July 31, 2013 and will run until June 30, 2017. The objective of STP II is to support Croatia in absorbing EU Funds in the research and innovation sector by providing capacity-building for selected public sector organisations and stimulating the demand for those funds from the business and scientific communities.
Science and Innovation Investment Fund Grant Scheme – (SIIF) and Technical Assistance (2007-2015)	The Science and Innovation Investment Fund – SIIF is a project financed under the Regional Competitiveness Operational Programme 2007-2013 and implemented by Ministry of Science, Education and Sport. The goal is to increase commercialisation of research results and technology transfer. The Fund is technically divided into two phases. Phase II runs until the end of 2015 and is worth more than EUR 11.2 million (EU funding: EUR 7.6 million). Grants have been made to 19 contracts/projects. Five projects that received EUR 5 million

Measure	Description
	from Phase I have been successfully implemented and closed. In addition to the grant schemes within the SIIF, there are two technical assistance projects/contracts. The first, in phase I, ended in 2012 and had a total value EUR 999 500; the objective of the second was to provide continuous assistance to project beneficiaries during project implementation. The total value of this project was EUR 279 500.
Croatian Science Foundation	
Research Projects Calls (ongoing)	The primary aim of the Research Projects Calls is to create new and enhance existing knowledge, supporting research groups that are working on internationally competitive issues, and whose leaders have been recognised for their scientific achievements. It is the main support instrument for international cooperation but also serves to promote and develop the strategic priorities of the Republic of Croatia. The ultimate goal of the call is to create a critical mass of research groups that will be competitive at an international level.
Unity through Knowledge Fund	
Connectivity Programme (2007-ongoing)	This programme facilitates short term mobility of researchers, with an emphasis on young researchers from Croatia going to excellent research and development facilities abroad in order to establish cooperation and/or acquire new skills necessary for advancing S&T competitiveness in Croatia, as well as on foreign-based researchers moving to and working in Croatia for short periods of time. From 2007 to December 2013, the Fund financed 42 projects. Grant size per single project is EUR 10 000. The average project duration is six months.
Research Cooperability Programme (2007-ongoing)	The Research Cooperability Programme supports medium-scale collaborative research projects in Croatia with involvement of the Croatian scientific and research diaspora. The Programme focuses on building international scientific cooperation with the Croatian scientific diaspora as well as foreign scientists and the private sector. From 2007 to December 2013, the Fund financed 43 projects within the Programme. The minimum grant size per single project is EUR 100 000 and the maximum is EUR 200 000. The average project duration is two years.
Young Researchers and Professionals Programme (2007-ongoing)	The Young Researchers and Professionals Programme focuses on advancement of young researchers, with an emphasis on establishing cooperation with international institutions and the private sector in order to enable them to lead scientific research autonomously, i.e. to prevent the brain drain. From 2007 to December 2013, the Fund financed 25 projects within the Programme. The minimum grant size per single project is EUR 50 000 and the maximum is EUR 100 000. The average project duration is two years.

Source: Deloitte

Remuneration

The minimum wages of participants in science and higher education are determined by collective agreement (in accordance with the Labour Act).

For further information, see the country profile on remuneration of researchers from the MORE2 study on the EURAXESS website.⁹

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

The implementation of the 'Charter & Code' principles is publicly promoted and supported by the Ministry of Science, Education and Sports and the Agency for Mobility and EU Programmes. The promotion of the 'Charter & Code' principles is also foreseen in the Action Plan for Mobility of Researchers and the Strategy for Education, Science and Technology.

To date, all public research institutions (including higher education institutions), the Croatian Academy of Sciences and Arts, the Croatian Science Foundation and three research organisations from the private sector have endorsed the 'Charter & Code' (37 altogether) and they are working on improving their HR strategy for researchers in accordance with those principles.

⁹ <http://ec.europa.eu/euraxess/index.cfm/services/researchPolicies>.

The Ministry, together with the Agency for Mobility and EU Programmes, offers support and information about the implementation process.

Fourteen Croatian public research organisations have completed the HRS4R process and received the “Human Resources Excellence in Research” logo from the European Commission.

Autonomy of institutions

The Constitution of the Republic of Croatia, international agreements and the Act on Scientific Activity and Higher Education provide higher education institutions with academic freedom for all members of the academic community, self-governance and autonomy.

The following table summarises the academic freedoms, academic self-government and university autonomy in the Republic of Croatia.

Table 6: Academic freedoms, academic self-government and university autonomy

Academic freedoms	Academic self-government	University autonomy
<ul style="list-style-type: none"> – Freedom of scientific and artistic research and creativity; – Teaching; – Mutual cooperation; – Freedom of association. 	<ul style="list-style-type: none"> – Regulation of study and students’ admission; – Selection of leadership and teachers; – Management of resources at the disposal of higher education institutions; 	<ul style="list-style-type: none"> – Organisation of internal structure; – Determination of educational, scientific, artistic and professional programmes; – Financial autonomy in accordance with the Act; – Decision-making on the approval of projects and international collaboration; – Other forms of autonomy, in accordance with the Act.
<p>Academic freedoms, academic self-government and university autonomy also include the responsibility of the academic community towards the social community within which institutions operate.</p>		

Source: Deloitte

Career development

The table below presents the different scientific titles and corresponding scientific-educational titles in the Republic of Croatia.

Table 7: Scientific titles and corresponding scientific-educational titles

Scientific titles	Corresponding scientific-educational titles
– Research associate	– Assistant professor
– Senior scientific associate	– Associate professor
– Scientific adviser	– Full professor
– Scientific adviser tenure	– Full professor tenure

Source: Deloitte

Procedures for appointment to scientific titles and scientific-educational titles must be carried out according to the Act on Scientific Activity and Higher Education. The latest amendments to the Act (see chapter 1 “National strategies” include:

- Re-evaluation of researchers and their re-election to their posts, or exceptionally to a higher grade, in place of compulsory promotion into the higher scientific and teaching grades, which had resulted in an excess of teachers in the higher scientific and teaching grades;
- Compulsory retirement of professors and researchers at age 65 (with further funding from public monies allowed only in exceptional cases);
- Additional selection of postdocs through public tender.

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

Procedures governing social security benefits must be carried out according to the Labour Act (OG 149/09, 61/11, 82/12, 73/13), the Act on Employment Mediation and Unemployment Rights (OG 80/08, 94/09, 121/10, 25/12, 118/12, 12/13, 153/13) and Pension Insurance Act (OG 157/13).

In addition, the Act on Scientific Activity and Higher Education provides that in the case of persons employed in research and collaborative work places (financed from the state budget), extension of their contract is also

provided for by the collective agreement or by a general act of the scientific organisations (e.g. for maternity and/or parental leave, sick leave for more than three months, the performance of the public service or duty and other justified cases, etc.)

Doctoral and postdoctoral grants from the Croatian Science Foundation only cover researchers' short-term stay (3-12 months) in foreign academic institutions while employed at their home institutions. Therefore, sickness benefits depend entirely on each institution's individual policies and not on the Foundation's fellowships and grant schemes.

7. Collaboration between academia and industry

A number of Croatian strategic documents recognise the importance of industry/academia cooperation in line with the objectives of the 'Europe 2020' strategy. These documents include the Economic Programme of the Republic of Croatia 2013 and the Croatian Government Programme for the Mandate 2011-2015. The following table summarises programmes designed to enhance collaboration between academia and industry and to foster doctoral training in cooperation with industry.

Table 8: Collaboration between academia and industry

Publicly funded programmes	Description
Business Innovation Agency of the Republic of Croatia (BICRO) (ongoing)	<p>The Business Innovation Agency of the Republic of Croatia was founded by the Croatian Government to implement technology development and innovation support programmes. It is a central institution in the national innovation system for supporting innovation and technology advancement. Its programmes are:</p> <ul style="list-style-type: none"> – PoC PUBLIC – provides funding for ideas and concepts, prototypes and intellectual property protection and a "spin-off" from universities and scientific institutes; – PoC PRIVATE – provides checking and confirmation of the commercial application of research results and helps establish an appropriate strategy for continued commercialisation; – RAZUM – provides initial funding for newly established knowledge-based companies as well as funding research and development of new products or services in existing companies; – TEHCRO - supports commercialisation of research outputs and the transfer of knowledge from universities and scientific institutions to business and also supports development of Technology Business Centres, Technology Incubators and Research and Development Centres; – TEST – provides funding for research projects that develop new technologies and that upon completion of the research phase strive to further commercialise and create new products or services; – IRCRO – supports cooperation between industry and technology institutions, facilitates maximum usage of infrastructure in scientific research centres and supports industrial companies in substantially increasing their R&D activities; – EUREKA – supports innovative SMEs in their international collaborative market-oriented R&D projects and is open to all areas of technology. <p>As a part of the European Enterprise Network, BICRO provides advice as well as networking between chambers of commerce, technology centres, universities, research institutes and development agencies, powerful interconnected databases, through which members of the network share their knowledge and information about technologies and business partners.</p> <p>BICRO is also one of the beneficiaries of STP II.</p> <p>There will be an ex-post evaluation of RAZUM, TEHCRO, TEST and IRCRO in 2014. Improvements will be made based on the results of evaluation.</p>
Croatian Science Foundation, Partnership in Research Programme (ongoing)	<p>This programme aims to improve cooperation between research institutions, industry and entrepreneurship and thus increase investments in research. The annual budget per project is approximately HRK 500 000 (some EUR 65 900) (for projects lasting up to three years) including material expenses, equipment, salaries, travel costs and cooperation. Partner institution participation and 50% co-financing is mandatory. There have been no open calls since 2011, but the programme has not been formally discontinued. .</p>
New International Fellowship Mobility Programme for Experienced Researchers in	<p>One of the strategic objectives of this programme (see Chapter 6 "Working conditions") is to provide an impetus to an effective labor market for researchers in Croatia, connecting industry and universities, public and private research institutions,</p>

Publicly funded programmes	Description
Croatia – NEWFELPRO	and industrial laboratories, enhancing knowledge transfer and preparing better employment opportunities for researchers with special attention to SMEs' innovative processes.
Unity through Knowledge Fund (UKF) (ongoing)	The objective of the Unity through Knowledge Fund is to unite scientific and professional potential in Croatia and the diaspora in developing of the knowledge-based society. Through the annual approval of around a dozen 'Cooperability', 'Young Researchers and Professionals' projects and the '3C Research in Industry and Academia Grants', UKF encourages the competitiveness of national research at an international level, fosters research that creates new values in the Croatian economy and funds projects that help the development of research infrastructure in Croatia. The fund is one of the components of STP II.

Source: Deloitte

Inter-sectoral mobility is gaining in importance and is included in the Economic Recovery Programme, and the Action Plan for Mobility of Researchers, and was part of the Pre-Accession Economic Programme.

8. Mobility and international attractiveness

In 2011, the percentage of doctoral candidates (ISCED 6) who were citizens of another EU-27 Member State was 2.5% in Croatia compared to 4.2% among the Innovation Union reference group and an EU average of 7.7%¹⁰. In the same year, non-EU doctoral candidates were 2.4% of all doctoral candidates in Croatia compared with 5.2% among the Innovation Union reference group and an EU average of 24.2%¹¹.

Human capital building in S&T is below the EU average. Croatia already has a large scientific diaspora, and the lack of attractive research infrastructures and good research management is leading to a further increase in the brain drain. The Ministry of Science, Education and Sports and the Agency for Mobility have, however, stepped up efforts to build human capital by actively supporting the principles of the European Charter for Researchers and the Code of Conduct for Recruitment of Researchers, seeing this as critical to making Croatia internationally attractive (see chapter 6 "Working conditions". The Croatian Researchers Mobility Portal was launched in 2009¹².

In the academic year 2012-13, by place of usual residence, 97.2% of students were residents of the Republic of Croatia and 2.8% were residents of other countries. By citizenship, out of the total number of students, 97.6% were the citizens of the Republic of Croatia and 2.4% of foreign countries¹³.

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 9: Measures to attract and retain leading researchers

Measure	Objectives
Return of Croatian scientists to the country project (ongoing)	The Ministry of Science, Education and Sports has a long-standing policy of attracting prominent Croatian scientists currently working abroad, and assisting them in achieving the conditions for realisation of scientific research careers in Croatia. The new International Fellowship Mobility Programme for Experienced Researchers in Croatia – NEWFELPRO is a fellowship project of the Government of the Republic of Croatia and the Ministry of Science, Education and Sports (MSES). The project is co-financed through the Marie Curie FP7-PEOPLE-2011-COFUND program. Its total value is EUR 7 million, of which 60% is financed from national sources. NEWFELPRO's aim is over the long term to increase the presence of research-qualified individuals by providing them with new opportunities to gain relevant international experience, and thus contribute to the further development of international scientific networks. Applicants can apply freely within any scientific area of their choice and fellows/grants

¹⁰ See Figure 1 "Key indicators – Croatia"

¹¹ Ibid

¹² European Commission (2013), "Research and Innovation performance in EU Member States and Associated countries. Innovation Union progress at country level 2013"

¹³ Croatian Bureau of Statistics, "Students Enrolled on Postgraduate Specialist Studies, 2012/2013 Academic Year", available at: http://www.dzs.hr/default_e.htm

Measure	Objectives
	<p>are assigned only on the basis of the excellence and quality of research projects. Eighty-three fellowships are available as part of the NEWFELPRO project. There are specific schemes for outgoing and incoming fellows, including diaspora Croatians returning to the country.</p> <p>Fellows sign an employment contract in accordance with national regulations and their engagement must also be in line with the European Charter for Researchers and the Code of Conduct. The host institution is responsible for providing a stimulating environment and adequate infrastructure, equipment and consumables.</p>
Unity through Knowledge Fund	
Homeward Grant (ongoing)	The objective of the Homeward Grant introduced in 2007 is to attract Croatian scientists and experts from abroad to return home in order to enhance Croatia's competitiveness. Eligible candidates are all outstanding experienced researchers and experts of Croatian nationality or origin, who have built their career abroad and still live abroad, but have been offered a position at an organisation in Croatia or have returned to Croatia and taken a position at an organisation in Croatia within past two years.
Homeland Visit Grant (ongoing)	The objective of the Homeland Visit Grant introduced in 2007 is to open opportunities for outstanding researchers and experts of Croatian origin living abroad to visit Croatian knowledge-based companies, R&D organisations or public institutions in order to contribute to cooperation and to provide knowledge transfer to Croatia in order to advance science and technology.
My First Research Topic Grant (ongoing)	The objective of the "My First Research Topic" Grant, which has been available since 2007, is to give outstanding young researchers and experts from Croatia an opportunity to develop their innovative ideas. The applicants must have gained a doctorate within the last five years or be just about to finish a doctorate. The grant helps the young scientist to increase their experience and boost their career in science or industrial research and development with the ultimate goal of reducing the brain drain.
Reintegration Grant (ongoing)	The objective of the Reintegration Grant introduced in 2007 is to attract the best young homecoming researchers and experts to start autonomous careers in Croatia. The grant should help the candidate's reintegration after her/his stay abroad and facilitate knowledge transfer to the Croatian host organisation.
Croatian Science Foundation	
EMBO Installation Grant (EMBO IGs) (2009-ongoing)	The objective of the programme is to help leading life scientists set up their labs in Croatia and rapidly establish a reputation in the European scientific community. The programme targets Croatian and foreign life science researchers who have spent two consecutive years outside Croatia and Croatian institutions and universities. The successful applicant receives EUR 50 000 annually for three to five years.
Fellowships for Doctoral Students (ongoing)	The main goal of the programme is to increase research standards, to raise the quality of doctoral studies and to promote the international mobility of young researchers during their doctoral studies. Within the priorities determined by the Strategic Plan of the Ministry of Science, Education and Sports 2014-2016, the Croatian Science Foundation co-finances the doctoral education of assistants, research novices and expert associates employed by Croatian universities and research institutes, and enrolled in an accredited doctoral study in Croatia, to carry out their research or pursue part of their doctoral education at internationally recognised institutions. Foreign doctoral students from academic institutions are invited to conduct research projects within accredited doctoral study courses at one of the Croatian scientific and academic institutions. Personal grants are given for research stays lasting from three to twelve months and the monthly budget per grant is approximately HRK 7 500 (some EUR 988).
HRZZ Installation Grants (ongoing)	The objective of the Installation Grants is to help leading scientists, with two to five years of postdoctoral experience, to set up their research activity in Croatia and rapidly establish a reputation in the European scientific community. The grants are available to Croatian and foreign researchers with two to five years of postdoctoral experience in Croatia or abroad with proven institutional support. Projects are submitted within three research fields. Successful applicants receive up to HRK 350 000 (some EUR 46 141) annually for three years.
Postdoc Programme (ongoing)	The objective of the Postdoc programme is to improve the professional competencies of young researchers holding a PhD and to support their early scientific independence. The programme targets Croatian postdoctoral students from Croatian research institutions and foreign postdoctoral students coming to Croatia in order to carry out research projects. Personal grants are given for research stays lasting from three to twelve months and the monthly budget per grant is approximately HRK 9 750 (some

Measure	Objectives
	EUR 1 285).

Source: Deloitte

Inward mobility (funding)

The Republic of Croatia has so far published two action plans for mobility of researchers:

- Action Plan for the Mobility of Researchers 2009-10;
- Action Plan for the Mobility of Researchers 2011-12.

An Action Plan for the Mobility of Researchers 2014-2016 will be published in 2014.

The Croatian Science Foundation provides fellowships for Doctoral and Postdoctoral Students (see table above). The objective of these fellowships is to improve the research standard and quality of doctoral studies and to promote international mobility of young researchers during and after their doctoral studies.

In addition, the HRZZ Installation Grants programme of the Croatian Science Foundation (see table above) encourages young scientists to further develop their research careers in Croatia and not only to contribute to modernisation of the Croatian higher education and research area but also to enhance the competitiveness of Croatia's researchers in the European Research Area.

Outbound mobility

On the basis of bilateral agreements and programmes, and in accordance with common interests and priorities, the Ministry of Science, Education and Sports of the Republic of Croatia supports international research projects (usually biennial projects). In 2012 (most recent data available), bilateral research projects were financed with the following countries: Austria, Germany, France, FYR Macedonia, Montenegro, Serbia, Slovenia, China, Japan, and USA. Finance allocated for these projects is intended to serve the mobility of researchers: the Ministry covers the travel expenses of Croatian researchers travelling abroad and the expenses of foreign partners' stay in Croatia (whereas the contracting party covers the travel expenses of their researchers and the cost of the stay in the other country of Croatian researchers). Joint committees select the projects on the basis of competitions and completed reviews. See also table above (the Croatian Science Foundation fellowships).

Promotion of 'dual careers'

The Government of the Republic of Croatia does not actively promote policies/measures supporting researchers' dual careers.

Portability of national grants

In Croatia, publicly funded grants or fellowships are not portable to other EU countries.

Access to cross-border grants

Doctoral and postdoctoral grants of the Croatian Science Foundation can only be awarded to successful candidates:

- a) with Croatian citizenship, who are already employed by Croatian universities and research institutes;
- b) without Croatian citizenship – foreign doctoral students who plan to conduct a research project at one of the Croatian scientific and academic institutions as part of accredited doctoral study in Croatia (regardless of their employment status).