R&D Capacities

CREATING R&D CAPACITIES AND INSTRUMENTS FOR BOOSTING HIGHER EDUCATION-ECONOMY COOPERATION

ANALYTIC ASSESSMENT OF THE CURRENT R&D SITUATION AT UNIVERSITIES IN BOSNIA AND HERZEGOVINA, KOSOVO, MACEDONIA AND MONTENEGRO

Survey at the University of Sarajevo,
University of Prishtina,
Ss. Cyril and Methodius University
and University of Montenegro

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TEMPUS

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We, the editors, would like to this opportunity to thank all partners involved in the making of this report. We want to acknowledge the help of the university staff – professors, deans, rectors and vice-rectors – who filled out the questionnaire. Most notably our special thanks go to the R&D Service Centre Managers of the four Partner Country Universities – the University of Sarajevo, the University of Prishtina, the Ss. Cyril and Methodius University and the University of Montenegro – who largely contributed to the collection of the data and the finalisation of the present document.

The Editors
Graz, 2011

Preface

Why introductory notes?

The present report is the output of the initial analytical work in the project 'R&D Capacities' carried out in 2009. On the one hand it reflects the situation at Western Balkan universities in the year 2009, on the other hand provides essential inputs for consecutive steps within the project: it serves as a common basis for strategy development at the four Western Balkan universities, where structured and comparable quantitative and qualitative information is needed, and provides essential data for the optimal implementation of the R&D Service Centres.

This assessment, published in 2011, represents a one-off activity that was carried out by the project partners more than one and a half years ago and which is now presented for the first time to a wider public. These introductory notes are thus intended to provide the interested reader - not familiar with the project in detail – with the wider context and frame of the results produced in the course of the analytical assessment.

Background and Rationale of the R&D Capacities Project

Knowledge can be regarded as the key driver for future economic growth and structural change in Europe's economies. Universities have to be understood as pivotal engines of this process (Romer 1986, OECD 2004, The Work Foundation 2007). On the one hand – and from an innovation system perspective - the university sector plays a central role in producing new scientific and technological knowledge to be transformed into economic activities, on the other hand universities train scientists, managers and engineers, thus adding to the knowledge base of an economy (Lundvall 1992, Freeman 1995, Fagerberg et al. 2004). While policy actors widely acknowledged these facts, universities and collaborative links with the industry sector in many European countries still suffer from malfunctions and systemic failures (Arnold and Boekholt 2003, Arnold 2007, Nauwelaers and Wintjes 2008).

In the recent past the European Union has reacted to these challenges by initiating two complementary activities: The Lisbon Strategy and the Bologna Process. While the Lisbon strategy is focused on developing a European Research Area (ERA) by strengthening the universities' research capacities, the Bologna Process aims at reforming higher education (HE) and creating a European Higher Education Area (EHEA). Successful integration into the ERA, as well as the EHEA, is of utmost political and economic importance for both the Western Balkan region and the EU.

In the aftermath of the dissolution of Yugoslavia in the 1990s, the Western Balkan countries underwent massive institutional changes, which led to the fragmentation of the formerly effective and successful research sector (Radosevic 1998). Currently, one of the main barriers to a coherent R&D system relates to the linking of R&D institutes, universities and the private sector. These interactions are missing at most Western Balkan universities and where they exist, they mainly occur at individual level, with no institutional links being established (Radosevic 2007, Dall 2008). Against this background, Western Balkan universities largely rely on individual initiatives, and lack a consistent institutional approach. Furthermore, most of the universities in the Western Balkan region neither have their own university R&D strategy nor R&D support services/offices.

The project 'Creating R&D Capacities and Instruments for boosting Higher Education-Economy Co-operations' aims at addressing these specific shortages in the field of R&D at the most influential universities in Bosnia and Herzegovina, Macedonia, Montenegro, and Kosovo.

Layout of the Project

The aim of the project is to enable the universities to assume a central role in the national innovation system, thereby strengthening the role of higher education institutions as a whole and acting as a driving force for regional economic development. Its main objectives are the evaluation of the current R&D situation, the development and implementation of a comprehensive R&D strategy, the creation of R&D Service Centres, and the implementation of R&D pilot projects.

The project 'Creating R&D Capacities and Instruments for boosting Higher Education-Economy Co-operations' comprises four consecutive modules: development, establishment, implementation and sustainability. The comparative assessment of the Western Balkan universities was part of the development of modules, providing quantitative and qualitative information for the development of strategies.

Why a Benchmarking Exercise?

The term 'benchmarking' was first adapted to business practices by Xerox in 1979. Through the systematic and collaborative comparison of performance with its competitors, Xerox's aim was to carry out a self-evaluation, to identify the company's strengths and weaknesses and to adapt their mission/ vision to the constantly changing market conditions (Benchmarking in European Higher Education 2008). Benchmarking can be understood as a standardised method for collecting and reporting critical operational data in a way that enables relevant comparison of the performances of different organisations or programmes, often with the aim of establishing good practice (European Commission, DG Education and Training 2008). It is also often defined as a diagnostic instrument, a self-improvement tool, a collaborative learning exercise and an on-going evaluation and systematic approach of continuously measuring work processes (UNESCO -CEPES 2007). In general, the benchmarking approach attempts to analyse the factors determining the performance of a certain process by comparing various ways of carrying out the process. A standard or 'best practice' is identified by examining how the highest level of performance is achieved. From best practices one could learn how to improve the own process and increase the own performance (Bogan and English 1994). Benchmarking may be a one-off activity to provide a snapshot of a given area, but it seems to be more valuable as an on-going process of measuring and increasing organisational performance to lead to new strategic developments (Benchmarking in European Higher Education 2008).

With its initial assessment the project 'R&D Capacities' has taken up a one-off benchmarking approach in order to allow learning between partners from Western- and South-Eastern Europe but also among Western Balkan Universities. A survey was conducted within the framework of the R&D capacities project at the partner universities in 2009. This was done in order to assess the status quo of research performance at the University of Montenegro, the University of Prishtina, the University of Sarajevo, and Ss. Cyril and Methodius University of Skopje to create a common base of knowledge between experienced Western and developing South-Eastern European universities, and to create a basis for future development (Analytic Assessment of the current R&D situation at Universities in Bosnia and Herzegovina, Kosovo, Macedonia, and Montenegro 2009). The benchmarking exercise covers the following dimensions: general data, strategic orientation of university/faculty, organisation of research, R&D personnel, university funding, and research output. It is essential to mention that most of the partner countries' universities have conducted this kind of assessment in the field of R&D for the first time. Currently, most of the surveyed universities do not have a central point which is in charge of the evaluation process. Therefore, evaluations, if at all, are carried out sporadically and never systematically for the entire university, not to mention the whole country.

Where Does the Assessment Stand Compared to other European University Benchmarking Exercises?

The notion of international benchmarking at universities easily leads to an international ranking of higher education institutions like the Shanghai academic ranking of world universities with its intrinsic problems of irreproducible results (Florian 2007). In the context of strategic management of universities such an approach would be misleading and wrong. Benchmarking - in order to learn from the best - is a very complex process that needs detailed information rather than simple rankings of bibliometric outputs or Nobel laureates at a specific university. Benchmarking of higher education institutions in order to learn from good practice has attracted increasing interest by both researchers and practitioners in recent

years. In this respect the most prominent European examples are the EUMIDA project and the Benchmarking in European Higher Education Initiative.
The EUMIDA project comprised the following partners: University of PISA, Facoltà di Ingegneria, Dipartimento Sistemi Elettrici e Automazione (Coordinator), FRAUNHOFER – Gesellschaft zur Förderung der angewandten Forschung e.V., JOANNEUM RESEARCH – Forschungsgesellschaft mbH, NIFU STEP – Norwegian Institute for Studies in Innovation, Research and Education, and USI – Università della Svizzera Italiana. The main goal of the EUMIDA project was to test the feasibility of a regular data collection of micro-data on higher education institutions (HEIs) in all EU-27 Member States plus Norway and Switzerland. The project reviewed the issues of data availability, confidentiality, and the resources needed for a full-scale exercise. The EUMIDA project carried out two large data collections: one based on a set of core indicators (Data Collection 1) on the entire perimeter (n=2,457), the other based on an extended set of indicators but on a subset of institutions (n=1,364) defined as "research active" (Data Collection 2) (EUMIDA 2010).

The main findings of the data collections are: In terms of the highest degree delivered, 840 institutions (34.2%) deliver degrees up to the bachelor level, 675 (27.5%) up to the master level, and 892 (36.3%) up to the doctoral degree, while 2% of data is missing; this means that the higher education landscape is formed by three groups of approximately similar size. If various descriptors are used to build up clusters and if their number is optimised, it turns out that only two clusters emerge (in a slightly different specification, a small third cluster is visible, mostly formed by private institutions). These clusters correspond quite precisely to the University model (i.e. doctorate awarding, research active institutions: 52.2% of the total) and the College model (i.e. non doctorate awarding, partly active and partly non active in research: 47.8% of the total) (ibid). Out of the HEIs of the enlarged data set, only 399 report on their patent activities, whereof 195 display at least one application. The latter are primarily from universities in Finland, Italy, Norway, Spain, and the United Kingdom. All these statements refer to the group of applications with the HEI as one of the applicants. Only in 4 cases data is provided for applications with at least one inventor from a HEI (ibid). In the EUMIDA data set, only 282 HEIs report on spin-off companies; thereof only 105 with at least one company. The reporting is even weaker than in the case of patent applications and cannot be considered a valid source for analysis (ibid).

Data on funding and expenditure tends to be a weak part of statistical systems. Not only is research funding data at individual level reported only for a small number of institutions (n=504), but it also suffers from lack of standardisation. This is an area where further work is needed (ibid).
The Benchmarking in European Higher Education Initiative was initiated in 2006 by the European Centre for Strategic Management of Universities (ESMU), in a consortium with UNESCO European Centre for Higher Education (UNESCO-CEPES), the Centre for Higher Education Development (CHE) and the University of Aveiro. The project aimed to provide a deeper insight into the mechanisms of benchmarking in higher education and to develop guidelines and support for establishing and successfully pursuing new benchmarking initiatives. This was a two-year project funded by DG Education and Culture of the European Commission. The project was designed to help modernising higher education management and to promote the attractiveness of European higher education. It supported higher education institutions and policy makers in realising the Lisbon goals and the Bologna Process (Benchmarking in European Higher Education 2008).

The Benchmarking in European Higher Education project focused on the second type of benchmarking, i.e. the collaborative approach, and identified 18 collaborative benchmarking groups conducted by higher education institutions in Europe, Australia, Canada and the USA. For the purposes of the project 'benchmarking' was understood as a process of self-evaluation and self-improvement through the

systematic and collaborative comparison of practice and performance with similar organisations in order to identify strengths and weaknesses, and to learn how to adapt and improve organisational processes (ibid).
The analysis produced an overview of a broad selection of benchmarking practices in higher education. It was also the basis for guidelines for good benchmarking, an online tool, and a handbook in order to assist European higher education institutions in finding the most appropriate type of benchmarking practices for their own needs. In addition, the project produced four interactive events, one symposium in Brussels with approximately 120 participants and three practice-oriented workshops in Bucharest, Berlin and Brussels with more than 90 participants in total (ibid).

The most decisive finding of the group analysis was, that there is no single dominant model or even a small group of archetypes of benchmarking groups; benchmarking approaches in higher education vary by their aims, objectives, structure of the groups, their methods, and the kind of data used (ibid).

How do the results of the assessment within the framework of the R&D capacities project compare to these two big European initiatives?

Firstly, and most important, it can be said that problems with data availability are not confined to Western Balkan universities. Gaining sufficient quantitative data for strategic planning at universities is a problem shared with HEI in all European countries. Funding and R&D expenditures at universities in the whole European Research Area are statistically not sufficiently covered and additionally also lack cross-country comparability. Data on indicators related to commercialisation of R&D results (i.e. patents and academic spin offs) are rare and difficult to interpret at almost all universities within the European Union.
Secondly, it becomes obvious that there is no “single and optimal” benchmarking approach. The concrete selection of data and benchmarking methods varies with the objectives and intended outcomes of each individual comparative assessment. Each exercise has its own preconditions and intended outcomes; the same applies to the benchmarking exercise in the framework of the project ‘R&D Capacities’.
Thirdly, benchmarking should not be regarded as an activity in its own right but should be seen as what it is intended to be: a supportive action for the strategic management of higher education institutions, or for the development of science and education related policies. Thus, benchmarking represents a supportive tool for strategic HEI or R&D management. In the project ‘R&D Capacities’ the results of this initial assessment fulfil precisely these requirements.
Finally, benchmarking should not remain a one-off activity. In order to become effective, comparative assessments of universities should be done repeatedly on a regular basis. The Benchmarking in European Higher Education Initiative has demonstrated that there are plenty of examples of such inter-university benchmarking clubs. Thus, the universities involved in the project ‘R&D Capacities’ should take this opportunity and develop future activities leading to a regular benchmarking and joint learning possibilities well beyond the current project.

1 Introduction

Research and Development (R&D) is the heart of each society's innovation system. New and innovative ideas arise from up–to-date research; viable solutions to problems that a society faces are addressed by developing new tools, products and methods. Given these circumstances, it is of great importance that national innovation systems can deliver such outputs to satisfy the growing need of innovative ideas and tools. Beside the private sector, universities still contribute the main share of R&D to the national innovation system by producing new knowledge, developing technological innovations and by training highly qualified personnel.

The science and technology system of the former Socialist Federal Republic of Yugoslavia was of comparatively good quality even though it was unevenly distributed. Due to their sad and violent recent history the national innovation systems of most Western Balkan countries cannot compete with those of Western Europe or the United States nowadays. Besides, the lack of R&D infrastructure, financial means and a clear R&D strategy are mainly responsible for the continued marginalisation of research and a low level of university and business cooperation. In order to support the partner country universities (PCUs) in fulfilling the central role in their national innovation system, the TEMPUS programme "Creating R&D Capacities and Instruments for boosting HE-Economy Co-operations" addresses these shortcomings and aims to bring these societies one step closer to European standards (notably the Lisbon Convention and the Bologna Process).
The project at hand involves partners from seven different countries including the University of Leoben – AT (Contractor), Oxford University – UK, CIRPS – Sapienza University, Rome – IT, University of Montenegro – ME, University of Prishtina – Kosovo, University of Sarajevo – BA, Ss. Cyril and Methodius University – MK, Kosovo Centre for International HE and Technology Cooperation – Kosovo, Austin, Pock + Partners – AT and WUS Austria – AT (Coordinator). Amongst other things, the project aims to achieve the following outputs during its three year eligibility period (01/2009-01/2012):

1. Conducting an **analytical assessment** of the current R&D situation at each PCU
2. Setting up R&D **strategies, structures and procedures** at each PCU
3. Developing an R&D **Service Centre** at each PCU
4. Developing R&D **services and instruments** at each PCU
5. Implementing R&D **pilot projects** at each PCU
6. **Disseminating** the overall project **results** to important stakeholders and the public.

This report contributes to the first goal by delivering an analytic assessment of the current R&D situation at each PCU. The assessment was designed and analysed by Austin Pock + Partners and WUS Austria and carried out by the institutions themselves. The database created in the frame of this assessment will serve as a starting point for the creation of tailor-made strategies, structures and procedures to enhance the current R&D situation at each PCU.

The report is structured in several chapters, the second and third giving a closer insight into the research environment and presenting general R&D indicators gathered at each PCU. The fourth chapter deals with the strategic overview and assesses the current situation regarding the R&D strategy of each PCU. Finally, the chapters "Finance" and "Human Resources Management" present data concerning budgetary issues and the qualification of the PCUs' personnel.

2 Survey design and methodology

The present survey was conducted between March and September 2009. The aim of the survey was to perform a self-assessment of partner country universities (PCUs) in terms of research activities and structures. The following main targets have been defined in this context:

- Assess the status quo of research performance at SEE universities[1]
- Create a common base of knowledge between Western and South-East European universities
- Ensure comparability of universities
- Create a basis for future strategy development

1 Based on a survey carried out at four main universities in the selected region: University of Sarajevo (BiH), University of Prishtina (Kosovo), University of Montenegro (Montenegro), Ss. Cyril and Methodius University (Macedonia).

The questionnaires were developed in close cooperation with all project partners. General structure, survey topics and particular questions were widely discussed and adapted during the project launch meeting in March 2009 in Graz/Austria and questionnaires were pretested in April at the Ss. Cyril and Methodius University before starting the survey.

2.1 General structure of the assessment process

Sample selection is critical to the validity of the information that represents the populations being studied. Each partner country university selected 6 faculties to participate in the survey. Additionally, the rector or a vice rector participated in answering questions.
Five separate questionnaires had to be completed by either the rector or a vice-rector or at least six deans or vice deans of each partner country university.

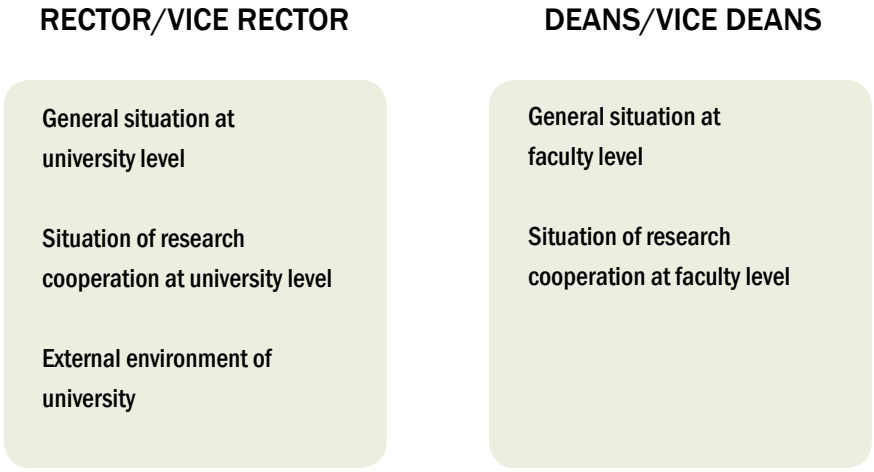


Figure 1: Questionnaire structure

Partner country universities started to complete questionnaires in April 2009. Data analysis was started in June 2009 and was completed by the beginning of September 2009.
The survey focused on factual information on the situation of research (R&D) and development at partner country universities and each questionnaire covered the following topics:

- General data (e.g. support and administrative units)
- Strategic orientation of university/faculty (e.g. research related objectives)
- Organisation (e.g. workflow of a typical research project)
- Research related human resources management (e.g. number of scientific staff according to the categories full professor, associated professor, lecturer, scientific assistant)
- Finance (e.g. funding sources of the university budget)
- Implementation of research (e.g. number of publications issued by the university)

2.2 Online survey

The survey was conducted online (http://www.onlineumfragen.com). Online surveys are relatively inexpensive to administer and can give very fast results. Every university received personalised login data and was then asked to complete the respective questionnaires.

Most questions were designed as closed-ended questions in order to save the respondents' time and to guarantee a high degree of standardisation of the answers. In order to avoid asking questions to people to whom they do not apply, contingency questions (answered only if the respondent gives a particular response to a previous question) were used several times.

In order to gain detailed and comprehensive insight into research structures and activities as well as to bridge gaps, questionnaires were quite long. Nevertheless, response rates were very high, ranging from 80 to 100%

Type of questionnaire	To be completed by	Number of questions	Response rate
Questionnaire on external environment of the university	Rector or vice rector	27	100%
Questionnaire on the general situation of the university	Rector or vice rector	98	100%
Questionnaire on the situation of research cooperation at university level	Rector or vice rector	28	100%
Questionnaire on the general situation of a faculty	6 deans or vice deans	93	92%
Questionnaire on the situation of research cooperation at faculty level	6 deans or vice deans	38	83%

Table 1: Response rates

The following illustration gives an overview of the faculties that participated in the assessment.

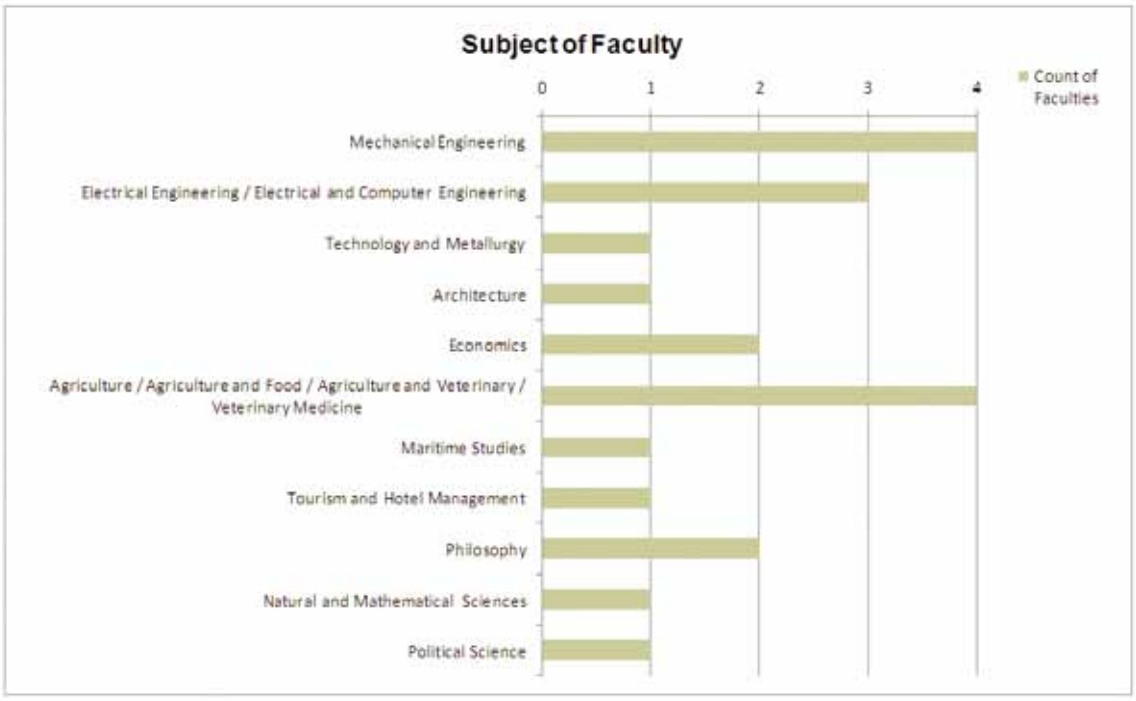


Figure 2: Participation in questionnaire, faculty

2.3 Data analysis

The above-mentioned online platform that was used to conduct the survey delivers automatic data export to Microsoft Excel. After all data was exported, further analysis was performed using Microsoft Excel for statistics as well as for graphs.

2.4 Discussion of results

By the middle of September 2009, a preliminary report containing data analysis was sent to all project partners. During a project meeting and conference in Sarajevo, on 28th-29th of September 2009, results of the self-assessment were widely discussed. Results of the discussion have been integrated into this report.

3 Overview of Research Environment

KEY RESULTS
All PCUs have a rather low budget for R&D activities
There is little to no support from government bodies for fundamental R&D activities
University research at the PCUs is estimated to be good at national level but mediocre at international level
The interest of companies or other research institutions to cooperate with universities is rather low
In contrast, the interest of other universities to cooperate with the PCUs is quite high

3.1 Players

Questions covered hereafter are e.g. “Who performs research activities?” and “What is the general research rate of a country?” Questions on the external environment of the assessed universities have been posed only at university level.

Please estimate the general research rate (% of GDP) of your country.	
University of Montenegro	0.0384%
University of Prishtina	No information available
University of Sarajevo	0.05-0.15%
Ss. Cyril and Methodius University	0.2%

Table 2: General research rate

Please estimate the contribution of research performed at your university to the overall research activities in your country.	
University of Montenegro	>75%
University of Prishtina	about 50-75% of overall R&D activities in the country
University of Sarajevo	25-50% of overall R&D activities
Ss. Cyril and Methodius University	>75%

Table 3: Research contribution at national level

Who performs relevant research activities in your country besides your university? Please estimate the number of institutions within the following groups.			
	Other national universities	Non-university research institutions	Business companies
University of Montenegro	0	1-5	-
University of Prishtina	No information available	5	No research activity performed by business companies in the country
University of Sarajevo	6-10	1-4	6-10
Ss. Cyril and Methodius University	1-5	1-5	10-50

Table 4: Relevant other stakeholders conducting research

The following table lists the top institutions currently performing research in PCU countries. Answers appear to be heterogeneous and there is no general trend within the four assessed countries.

If existent, please indicate the names of the top institutions for each category.		
Other national universities	*Non-university research institutions*	*Business companies*
University of Montenegro		
There is just one national university	Institute for Geological Investigation	Zeljezara Niksic
	Eco-toxicological Institute	Kombinat aluminijuma
	Institute for Metallurgy and Materials	Metalac
	Seismological Institute	-
	Hydro-meteorological Institute	-
University of Prishtina		
Not applicable	The Kosovo Academy of Science and Arts	-
	The Institute of Albanology of Kosova	-
	Institute of History of Kosova	-
	Pedagogical Institute of Kosova	-
	Institute of Reinvest of Kosova	-
University of Sarajevo		
University of Sarajevo	Economic Institute Sarajevo	
University of Tuzla	Hydro-Engineering Institute of Faculty of Civil Engineering Sarajevo	Elektroprivreda d.d.
University of Banja Luka	Economic Institute Banja Luka	Energoinvest d.d.
University of Zenica	Economic Institute Tuzla	BH Telecom
University of Mostar	Centre for Security Studies	Bosnalijek
University of Mostar West		Aluminij dd Mostar
University of Bihać		

Ss. Cyril and Methodius University		
Ss. Kliment Ohridski – Bitola	Macedonian Academy for Sciences and Arts	Alkaloid – Skopje
Ss. Goce Delcev – Stip	Institute for New Materials	Mikrosam – Prilep
State University – Tetovo		Hi-Tech – Skopje
South-East European University – Tetovo		Seawus – Skopje
		Sokomak – Bitola

Table 5: Top institutions

Please estimate the contribution of the above-mentioned groups to the overall research activities in your country.			
	Universities (incl. your university)	Non-university research institutions	Business companies
University of Montenegro	>75%	25-50%	0-2%
University of Prishtina / Kosovo	-	25-50%	-
University of Sarajevo / Bosnia and Herzegovina	25-50%	25-50%	25-50%
Ss. Cyril and Methodius University / Macedonia	>75%	25-50%	5-10%

Table 6: Research contribution of top institutions

Are there international universities that currently carry out more than 5 research projects in cooperation with local partner institutions in your country? If yes, please indicate the names.		
University of Montenegro	Don't know	
University of Prishtina	Yes	University of Natural Resources and Applied Life Sciences, Vienna American University of Kosovo, Kosovo
University of Sarajevo	Yes	University of Graz, Austria Brandenburg University of Technology Cottbus, Germany Vilnius University, Lithuania University of Ljubljana, Slovenia University of Bamberg, Germany
Ss. Cyril and Methodius University	No	

Table 7: International universities with more than 5 research projects

Please estimate the average research budget of the TOP 10 R&D companies in your country.	
University of Montenegro	about a few million Euros (less than ten, salaries included)
University of Prishtina	none existing, so far
University of Sarajevo	N/A
Ss. Cyril and Methodius University	0.5 – 5% of turnover

Table 8: Average budget of top 10 R&D companies

Is research unequally positioned within small/medium and large sized companies in your country? Please estimate for the following criteria.

The following two figures depict the positioning of research within small, medium and large sized companies for different criteria. The question only applies to the University of Montenegro and Ss. Cyril and Methodius University (see the last question).

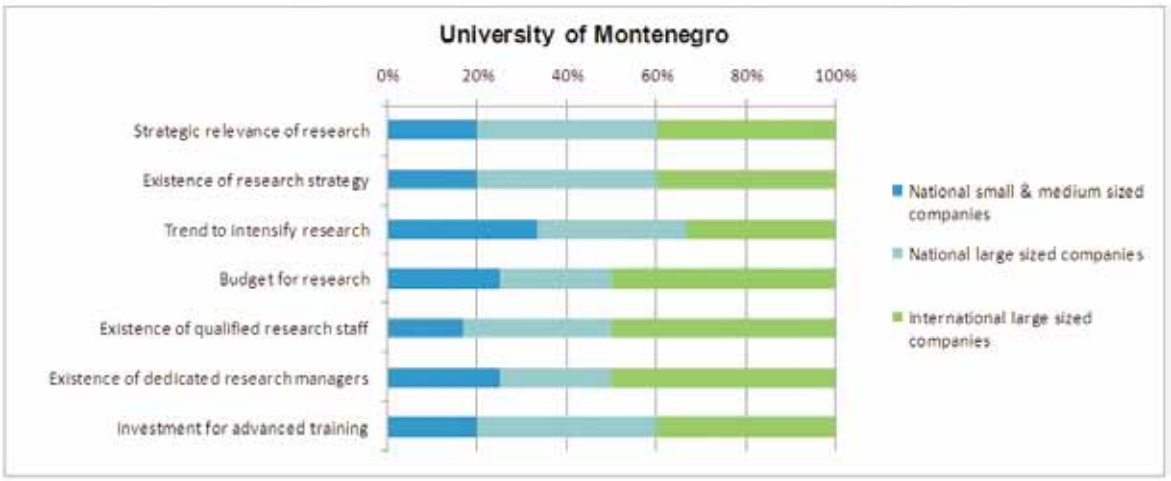


Figure 3: Estimation of Research in SMEs, University of Montenegro

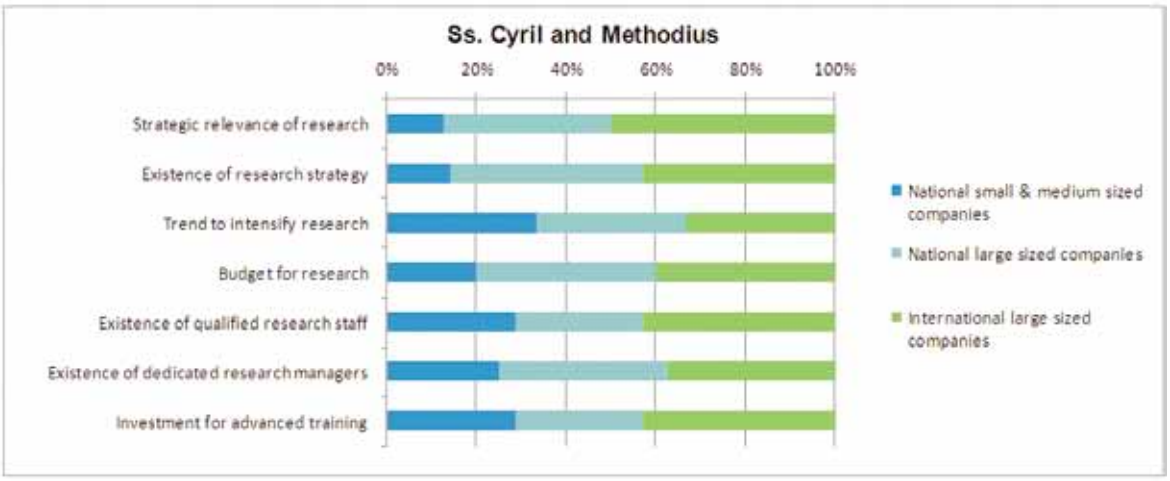


Figure 4: Estimation of Research in SMEs, Ss. Cyril and Methodius

Who supports research activities in your country?				
	University of Montenegro	University of Prishtina	University of Sarajevo	Ss. Cyril and Methodius Univ.
Central government	-	There is neither financial nor non-financial support foreseen to perform research activities	Non-financial support	Non-financial support
Ministry of Education and/or Research	Financial support	Only staff wages; buildings and other expandable materials	Non-financial support	Non-financial support
Ministry of Industry and Economy	Financial support	No	Non-financial support	Non-financial support
Ministry of Technology and/or Research	-	No	Non-financial support	
Ministry for Small and Medium Companies	Non-financial support	No	Non-financial support	Non-financial support
				Agency for promotion of entrepreneurship (financial and non-financial)
National and regional agencies	-	Neither financial nor non-financial support by national and regional agencies to perform research activity	-	-
None of the participating universities reported an international agency having a permanent establishment in the country.				

Table 9: Support of research activities

3.2 Cooperative Research

The following questions focus on external conditions and framework for cooperational research projects with external partners such as business companies, non-university research organisations, etc.

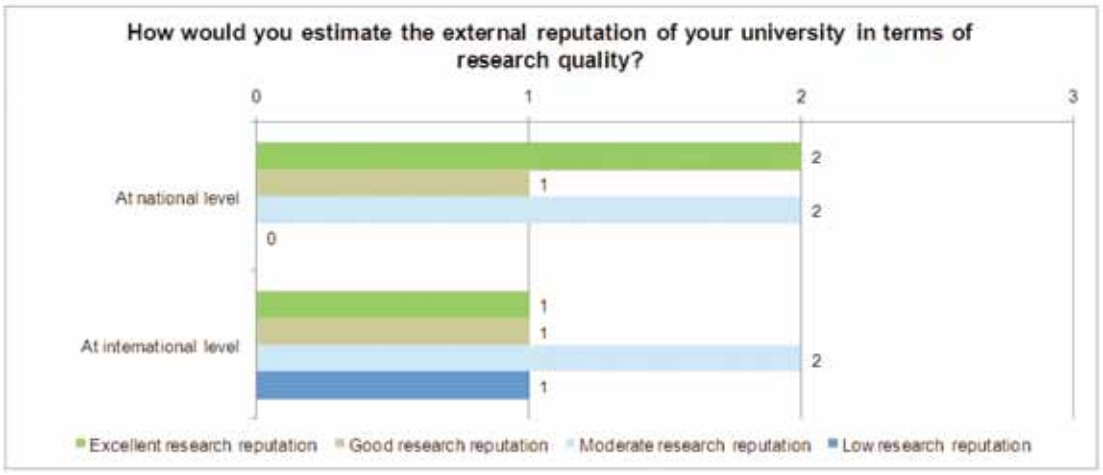


Figure 5: Reputation of research quality, university

At university as well as at faculty level, respondents rate the international reputation of their university/ faculty lower than the reputation at national level.

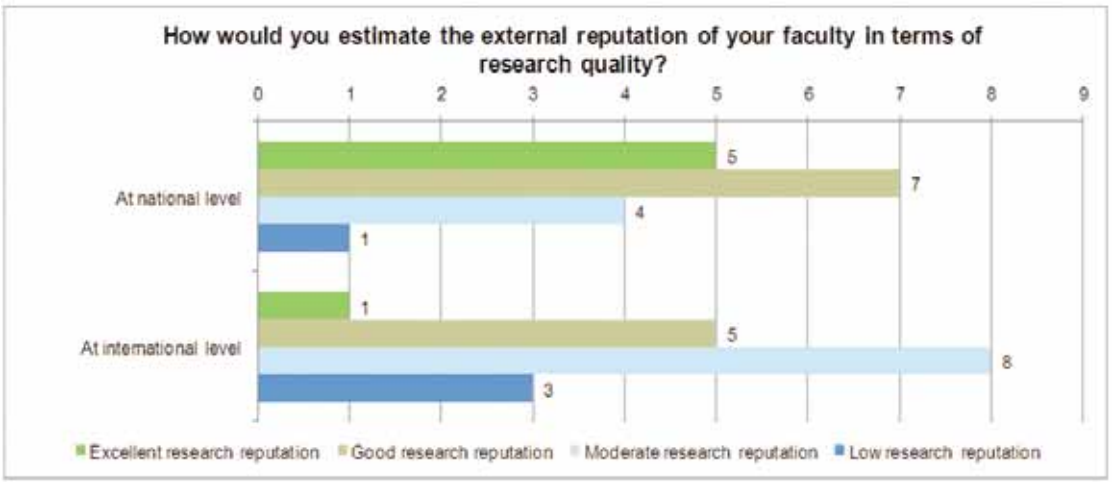


Figure 6: Reputation of research quality, faculty

Twelve respondents assess the reputation of their faculty as excellent or good at national level, whereas at international level the reputation of just 6 faculties is rated the same. At national level twelve respondents consider the reputation of their faculties as being excellent or good, five think it is moderate or even low. At international level answers are almost vice versa; the external reputation of six faculties is rated as being excellent or good, eleven respondents rate the reputation as being moderate or low.

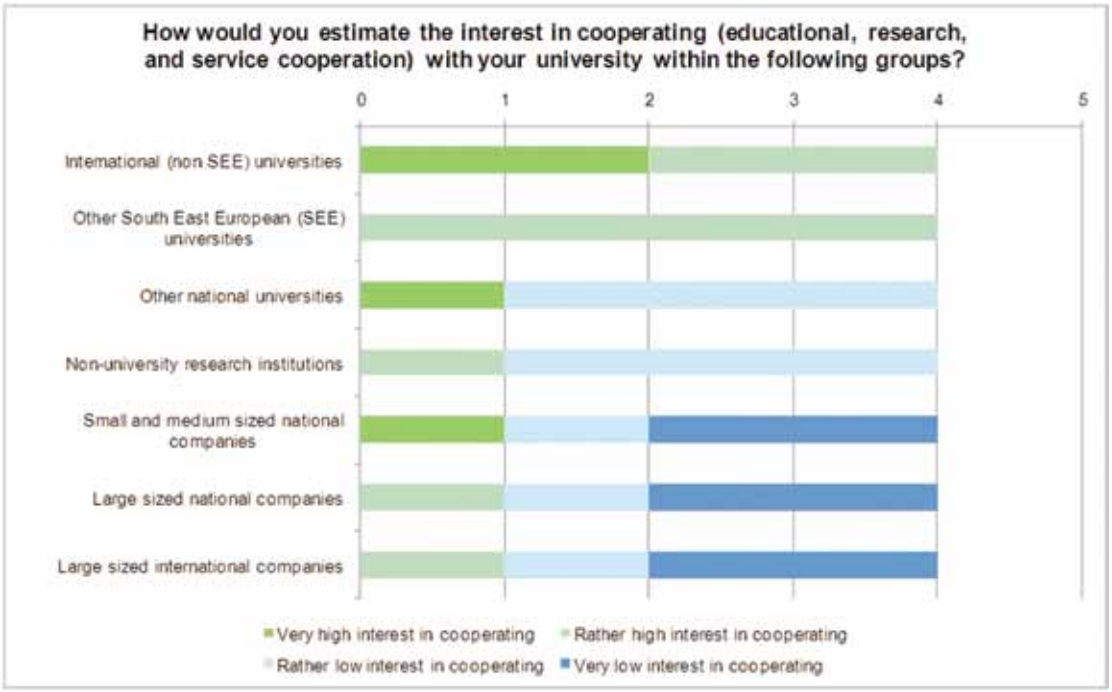


Figure 7: Cooperation interest of environment with university

The PCUs estimate that the most interest in various cooperations comes from international universities whereas they do not see such high interest in cooperation by other national universities and national or international research institutions and companies. Three out of four universities consider the interest in cooperating by companies as rather low or very low.

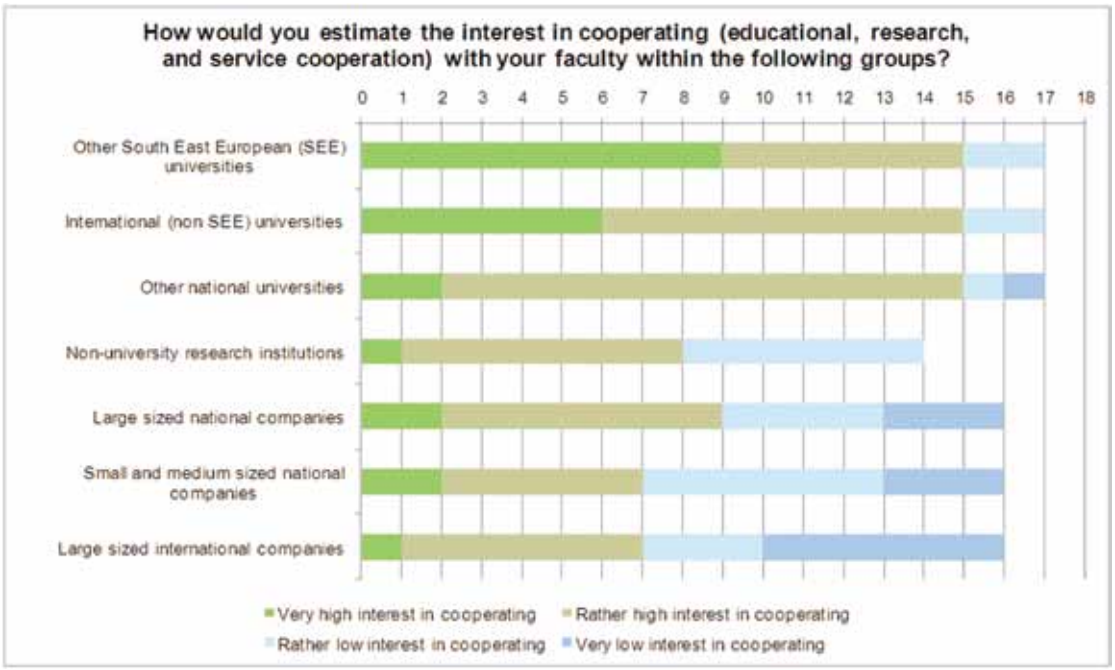


Figure 8: Cooperation interest of environment with faculty

Furthermore, 15 out of 17 respondents rate the interest of other universities in cooperating with their faculty as very high or rather high. The highest interest is seen among other South-East European universities. Three to six faculties expect that companies have very low interest in cooperating with their department; large sized international companies are estimated as having the least interest. Nonetheless, approximately half of the respondents think that companies have a very high or at least rather high interest in cooperating.
The following table lists answers regarding the possible advantages external partners may obtain by cooperating with the PCUs.

What kind of advantages can external partners derive from cooperating with your university?
Educated staff
Exchange of ideas and experiences
Exploration of potential research and development activities within Kosovo
Good IT
Good service
Integrated university that gives the opportunity to rationalise the administrative structure
Provision of useful information for potential international business investments in different fields
University which develops lifelong and continuing education
University with European norms and standards in all spheres of its activities

Table 10: Advantages for partners from cooperation, university

The following table gives an overview of the representatives' opinion on advantages external partners can derive from cooperating with one of the assessed faculties. The information is presented in categories.

What kind of advantages can external partners derive from cooperating with your faculty?	
Occurrences	**2**
	Education/Training
1	Adult education for different target groups
1	Specialist courses in the field of engineering
1	Training in laboratories (heat and fluid flow)
1	Knowledge refreshment
1	Renown for the quality of its graduates

Knowledge/Research

5	Expertise, expert support, strong expertise in certain areas, solid professional knowledge
5	Experience, exchange of ideas and experiences, knowledge exchange
4	Exchange of new ideas (based on research), new innovative/original ideas
3	Consulting
2	Sharing information during conferences and seminars
1	Approach to other research activities
1	New approaches in maritime applied sciences
1	Total scientific potential in some domains of maritime sciences
1	Insight in new technologies
1	Consolidation of knowledge

Human capital

1	Highly motivated research personnel
1	Young, dynamic and flexible academics
1	Use of students for on-site work

Services/Exploitation

3	Printing publications, lectureship (of local languages, of oriental languages)
1	Services in the field of transportation
1	Several well equipped laboratories

Others

1	Commitment to new and creative approaches to education and research
1	Multicultural working environment – UNESCO city
1	The Faculty of Natural Sciences is one of the leading teaching and research faculties in Kosovo

Networking/Lobbying

1	Approach to other financial resources
1	Good network with related institution in the region
1	Provide useful information for potential international business investors in future
1	Identify research and development activities in the field of agriculture in Kosovo
1	To be more attractive at national and international tendering procedures
1	To be more attractive at international tendering procedures
1	Cooperation within projects

Table 11: Advantages for partners from cooperation, faculty

Although the interest of companies to cooperate with universities seems to be rather low, it has to be stated that the development of relationships between universities and the economy is of crucial importance within all research and development activities: One possible way to realise this goal is to create within a university the expertise to support SMEs in terms of innovation, which can generate profit for the business as well as the university and, on the other hand, foster human capital. Done properly, such cooperation may become a veritable success story, boosting the whole initiative not only at university level but serving as a good practice example to other stakeholders, too.

Possible interfaces between university and the economy can be established, e.g. via employability/ career centres, industry cooperation centres, technology parks, etc. Furthermore, cooperative project proposals could be set up in a way that they include internships and trainings at companies as a part of the project. It is crucial to have an intensive information exchange between these centres in order to enable knowledge transfer and to share experiences (lessons learned).

4 General Data on Surveyed Universities

KEY RESULTS
All assessed universities are both research based and teaching oriented
50% of the PCUs indicate being integrated
There is a highly heterogeneous amount of employed staff and allocated budget between all four PCUs
Most of the budget of the PCUs is allocated by state ministries
Most of the PCUs handle their budget with the help of budget lines and not as a lump sum

4.1 Foundation and historical milestones

The following two tables specify founding years and research relevant milestones of the assessed universities. All assessed universities were founded after World War II.

In which year was your university founded?[1]	
University of Montenegro	1974
University of Prishtina	1969
University of Sarajevo	1949
Ss. Cyril and Methodius University	1949

Table 12: Founding year, university

Please indicate the 3-5 most important historical milestones related to RESEARCH at your university (scientific achievements, awards, establishment of main research institutions, special publications, etc.) within the last 50 years.	

	University of Montenegro
1960	Establishment of first faculty – faculty of economics
1974	Establishment of the University
1994	Establishment of the first publications, published in Montenegro having the international editorial board-matematica Motesnigri
2004	Establishment of the new organisational scheme with the institutes under the umbrella of the University
2009	External evaluation of research capacities of the University of Montenegro and creation of research strategies for the next five years

	University of Prishtina
2004	Approval of the university status
2007	Awards for the best research paper
2009	Establishment of research project office
2009	Employment of a manager responsible for research at university
2009	Creating R&D capacities and instruments for boosting higher education – economy cooperation

	University of Sarajevo
1999	Establishment of the Institute for Genetic Engineering
1999	Establishment of the Institute for Hydrotechnology
	Ss. Cyril and Methodius University
1965	IZIIS
1998	Marnet
2003	Foundation of Centres of Excellence – Chemistry
2004	Centres for technology transfers
2009	Start of integrated university

Table 13: Research milestones, university

The following tables specify the founding years and the most important historical milestones of the participating faculties.

In which year was your faculty founded?		
University of Montenegro	Faculty of Architecture	2002
	Faculty of Economics	1960
	Faculty of Maritime Studies	1959
	Faculty of Mechanical Engineering	1971
	Faculty of Philosophy, Niksic	1963
	Faculty of Tourism and Hotel Management	1999
University of Prishtina	Faculty of Economics	1970
	Faculty of Electrical and Computer Engineering	1971
	Faculty of Mechanical Engineering	1988
	Faculty of Philology	1970
	Faculty of Agriculture and Veterinary	1973
	Faculty of Mathematical and Natural Sciences	1971
University of Sarajevo	Faculty of Architecture	1949
	Faculty of Electrical Engineering Sarajevo	1960
	Faculty of Mechanical Engineering	1958

Ss. Cyril and Methodius University	Faculty of Agriculture	1947
	Faculty of Electrical Engineering and Information Technology	1959
	Faculty of Mechanical Engineering	1959
	Faculty of Technology and Metallurgy	1959
	Faculty of Veterinary Medicine	1991

Table 14: Founding year, faculty

Please indicate the 3-5 most important historical milestones of your faculty.

University of Montenegro	**Faculty of Economics**		
		2008	Analysis of the effects of privatisation in Montenegro
		1996	Spatial plan of Montenegro
		2003	Poverty reduction strategy
		1996	Award from the Chamber of Economy of Montenegro
	Faculty of Architecture		
		2005	Chart of Association of Urban Planners of Serbia
		2008	Student Award of Urban Planning Salon, Association of Urban Planners of Serbia
		2008	National representative at the International Exhibition of Architecture – Biennial of Architecture in Venice
	Faculty of Philosophy, Niksic		
		2008	The Institute of Philosophy and Sociology combined was established on 7th April. Later that institute was divided into two institutes. The first is the Institute of Philosophy.
		2008	The Institute of Sociology was first established in 1993 together with the Institute of Philosophy. Later it became independent.
		1993	Institute of Language and Literature, 7th April
		1993	Institute of Geography, 12th May
	Faculty of Maritime Studies		
		1977	Establishment of Maritime Institute
		1988	First Maritime International Conference in Kotor
		1974	Periodicals "Zbornik Fakulteta za pomorstvo" started
		1995	Establishment of doctoral studies
		2008	Establishment of new doctoral studies in the domain of Maritime Sciences
	Faculty of Tourism and Hotel Management		
		2009	Conference, June 2009 (10th anniversary of the faculty followed by the international conference)
		2008	Round table: Trends in Rural Tourism, METUBES, 7th February 2008, Budva, Montenegro

University of Prishtina	**Faculty of Electrical and Computer Engineering**		
		1982-1987	Construction of educational facilities and the setting up of laboratories, research and scientific activities, an increase in the number of publications, promotion of international cooperation
		1991-1999	The period during which all Albanian professors and administrative staff were dismissed from work and Albanian students were expelled from university facilities. This was reflected in the quality of education, services and teaching, as well as the quality of practical work. It was also characterised by a "brain drain", as well as the advancement of junior academic staff.
		1999-2009	The post-war period is characterised by efforts to enhance quality in the overall activity of the faculty, perform repairs of damaged facilities, equip laboratories, raise salaries, reform study programmes and recruit new academic staff. During this, reforms in the management structure and reforms envisaged by the Bologna Declaration in the higher education system were carried out.
	Faculty of Agriculture and Veterinary		
		Before 1991	Transfer of agriculture education from high school (2-year study programme) to the faculty (4-year study programme)
		1991– 1999	Return to our buildings and normal education (after 8 years of being dismissed from normal education)
		2002-2005	Start of the Bologna Process of Education, development of Bachelor and Master curricula according to the Bologna Process

University of Sarajevo	**Faculty of Electrical Engineering**		
		1988	Establishment of the Faculty of Electrical Engineering research institutes and their involvement in research projects at state level (DC projects, leading state strategic projects) as project leaders in three DC projects in former Yugoslavia
	Faculty of Mechanical Engineering		
		1985	Development of new products (crew compressor, etc.)
		1986	Building and development of a new laboratory complex
		1988	Large projects 'National Priorities'
		2005	Start of new education process according to the Bologna Process
Ss. Cyril and Methodius University	**Faculty of Mechanical Engineering**		
		2002	Establishment of the Centre for Research, Development and Continuous Education
		2005	Establishment of a Centre of Excellence – Centre for Mechanical Engineering
		2006	Establishment of a Business Start-up Centre
		2007	Establishment of e-learning laboratory
		2008	Establishment of the Centre for Cleaner Production
	Faculty of Agriculture		
			Foundation of the faculty
		1974	Faculty becomes separate legal entity
		2003	Foundation of research and development organisation
		2004	Faculty of Agriculture becomes Faculty of Agriculture, Sciences and Food

Table 15: Research milestones, faculty

4.2 General Orientation

All of the assessed universities are both research based and teaching oriented. One faculty (6%) reports to be primarily research oriented, four faculties (24%) are primarily teaching oriented and a majority of 17 faculties (70%) are both research based and teaching oriented.

4.3 Administrative Organisation

The integration of universities and faculties is an ongoing issue in the Western Balkan countries. Whether a university is integrated or not clearly has an impact on the conditions for introducing research management systems. The following table indicates that half of the assessed universities are fully integrated universities.

Is your university an "integrated" university?	
University of Montenegro	Yes
University of Prishtina	No
University of Sarajevo	No
Ss. Cyril and Methodius University	Yes

Table 16: Status of integration, university

Please specify the domain which the integration is mostly reflected by.
Two universities checked "Yes, by financial management/control", as well as "Yes, by human resources/recruitment".

The following table describes the organisational chart of the management of assessed universities.

Please describe the organisational chart of the university management. Name the functions of the vice rectors at your university.				
Function of	*Vice rector 1*	*Vice rector 2*	*Vice rector 3*	*Vice rector 4*
University of Montenegro	Financial issues and development	Educational process	International cooperation and science	Public Relations
University of Prishtina	Resource and infrastructure	Teaching and research	International relations	-
University of Sarajevo	Financial issues and development	Educational process	International cooperation, publishing and student issue	Science and Research
Ss. Cyril and Methodius University	Education	Science	International collaboration	Finances, Investments and Development

Table 17: Organisation of the university management

Is there a university senate?

All four universities participating in the evaluation process reported having a university senate.

Are there other university regulatory bodies?

All four universities reported having further regulatory bodies. Three universities reported a Management Board (Board of University) which is concerned with "all executive issues concerning the development, with the exception of academic issues". In addition to that, one university runs a Supervisory Board performing the functions of "analysing reports concerning the development and activities, supervising annual reports and financial reports, informing the founder and management board of results". The Ss. Cyril and Methodius University runs a Rector's Board (rector and all deans and institute directors) which assumes the task of "preparing all significant documents for senate work – decision on number of students for enrolment, study programmes, participation of students, publishing issues, investments, etc.". In addition to that, there is a "Committee for international cooperation – publishing – IT – legal issues – student standard, etc." which deals with "different issues related to the specific subjects in areas related to committees".

Example 1: Organisational graph for the University of Prishtina:

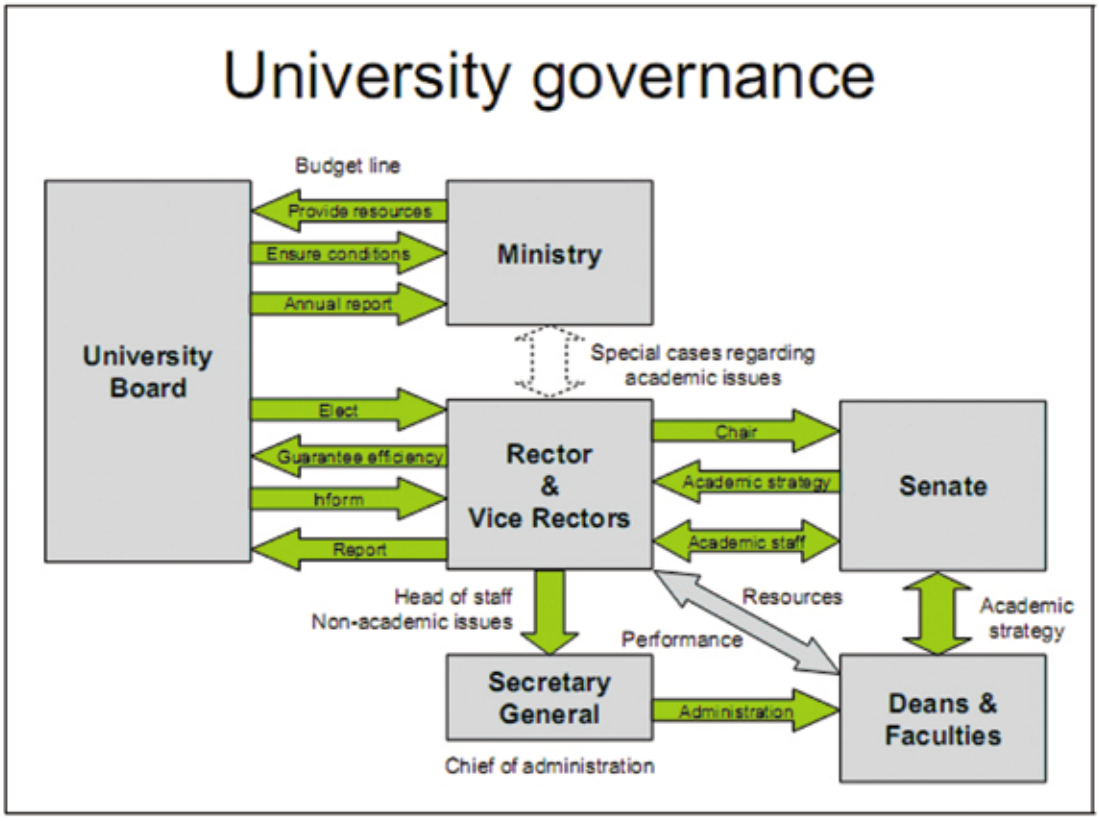


Figure 9: Organisational graph for the University of Prishtina

Example 2: Organisational graph for the University of Montenegro

Figure 10: Organisational graph for the University of Montenegro

Are there independent university research institutes that do not belong to a faculty?

Each of the universities reports independent university research institutes that do not belong to a faculty. The following list provides reported names of institutes:

University of Montenegro No data available from the University of Montenegro
University of Prishtina Albanological Institute Pedagogical Institute Institute of History
University of Sarajevo Institute for Genetic Engineering and Biotechnology Institute of History Oriental Institute Institute for Genocide and Research of Crime against Humanity and International Law
Ss. Cyril and Methodius University Institute of Agriculture Institute of Cattle-breeding Institute of Earthquake Engineering and Engineering Seismology Institute of Economics Institute of Macedonian Literature Institute of National History Institute of Sociology, Political Sciences and Law Institute of Southern Agricultural Breeds Krste Misirkov Institute of Macedonian Language Marko Cepenkov Institute of Folklore

Table 18: Independent university research institutes

Are there other institutions/units belonging to your university?

Only the University of Sarajevo stated that there are further institutions/units belonging to the university.

Please describe the organisational chart of the faculty management.

Faculties had to answer organisational questions at faculty level. The subsequent table provides the given data on functions of vice deans at the assessed faculties.

Please describe the organisational chart of the faculty management. Name the functions of the vice deans at your faculty.		
Vice dean 1	*Vice dean 2*	*Vice dean 3, 4, 5*
University of Montenegro		
Finance and quality	Teaching issues	
Education	Science	
Education	Science and international relations	Finances and development
Teaching	International relations	Science and research
Teaching process	International collaboration	
International Cooperation	Academic affairs	Vice dean 3: Research and Public Relations Vice dean 4: Director of Doctoral Studies Vice dean 5: Director of the School of Management
University of Prishtina		
Teaching	Responsible for material matters	
Teaching & research (planning, development, coordination and supervision of all teaching and research activities)	Administration and leading of all finance functions	
Teaching and research	Finance	
Teaching issues	Financing issues	

Education (organisation and monitoring of education process)	Monitoring of the financial process	
Academic issues	Financial issues	
University of Sarajevo		
Financial issues	Education and students issues	International affairs and research
Educational affairs	Finances	Science and research
Education	Science and research	International relations
Teaching process	International cooperation	
Ss. Cyril and Methodius University		
Education	Finances and cooperation with companies	Research and international cooperation
Education and training	Science and international cooperation	
Education	Science	International cooperation
Science	Education	
Finances and material management	International cooperation, science and development	Education and student services

Table 19: Organisation of the faculty management

How many subunits (institutes, departments, etc.) belong to your faculty? Please specify names and functions of the subunits.

How many subunits (institutes, departments, etc.) belong to your faculty?		
	Number of subunits	**Subunits per faculty (median)**
University of Montenegro	51	8
University of Prishtina	74	11
University of Sarajevo	86	26
Ss. Cyril and Methodius University	47	11
	258	**12**

Table 20: Subunits of faculty

The faculty questionnaire provides data on a total of 258 subunits. The median number of subunits per faculty is 12.

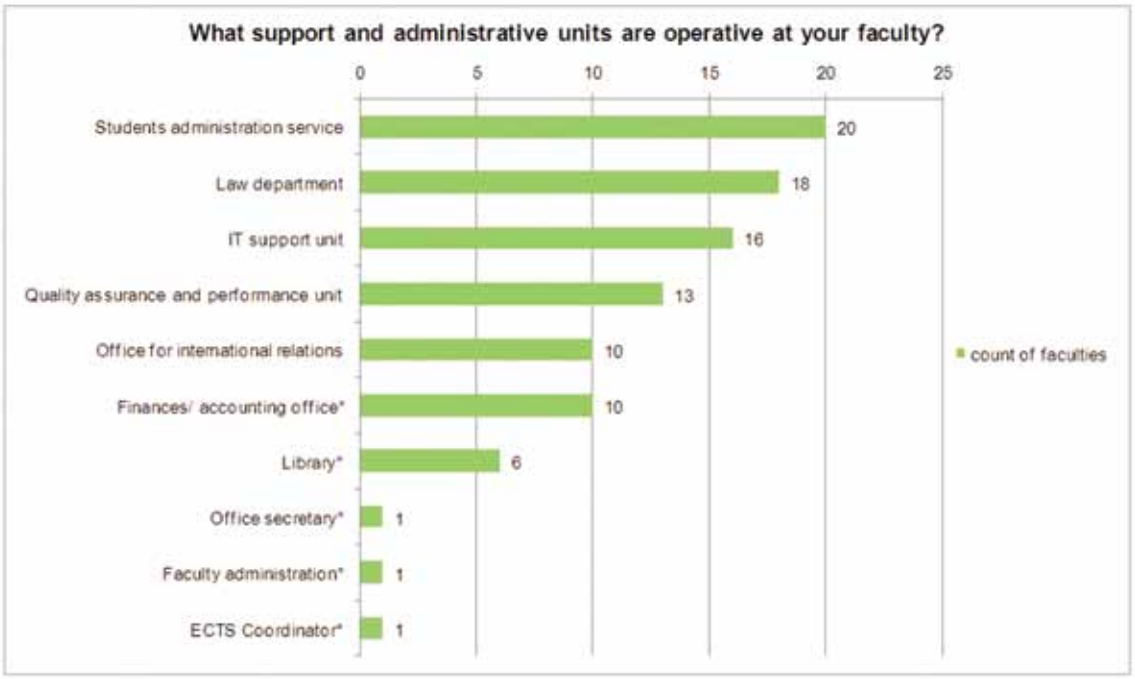


Figure 11: Support and administrative units, faculty

*Administrative units marked with an asterisk were not given in the questionnaire but stated by respondents.

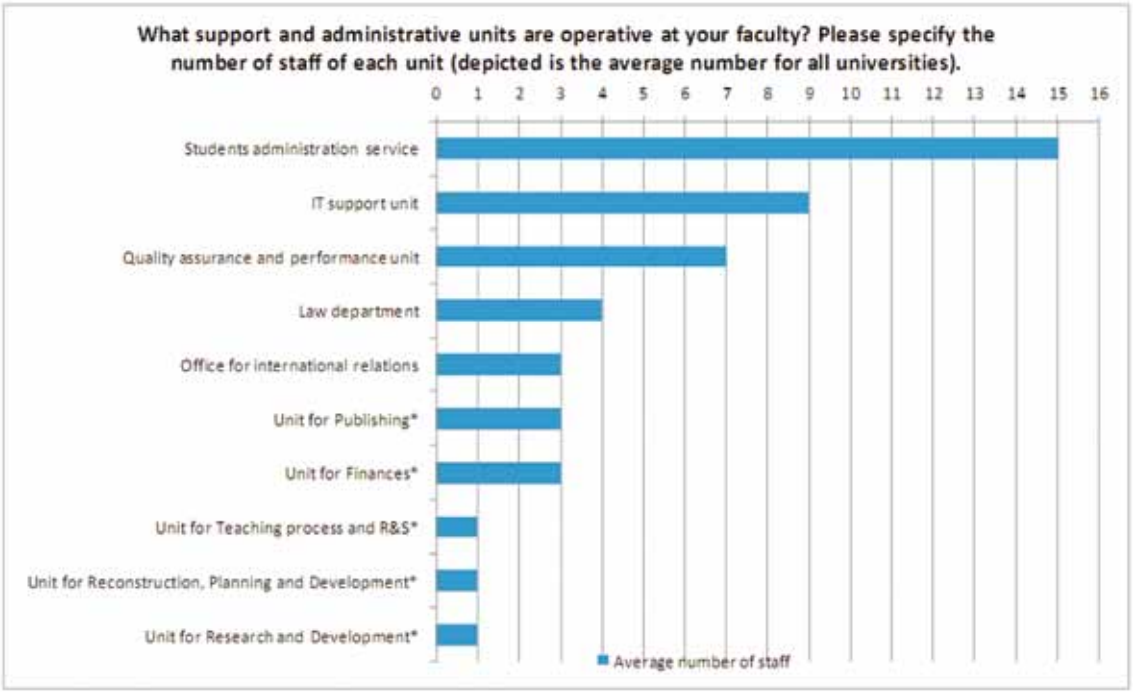


Figure 12: Staff of administrative units, faculty

*The University of Sarajevo specified additional central support and administrative units.

4.4 Number and Distribution of Students

Numbers of students vary highly among assessed universities.

Please indicate the number and distribution of students of your university in 2008 across levels.

Function of	*Bachelor study (3 years)*	*Master study*	*Diploma study (4 years)*	*Doctoral study*
University of Sarajevo	15.000	3.000	22.000	200
University of Prishtina	31.010	2.824	There is no diploma study any more	152
University of Montenegro	13.500	3.400	400	150
Ss. Cyril and Methodius University	4.248	8.084	27.482	Curriculum still under development

Table 21: Number of students 2008, university

According to data at university level, the majority of students are enrolled in bachelor studies. The same holds true for data gained from faculties.

Please indicate the number and distribution of students of your faculty in 2008 across levels.

Function of	*Bachelor study (3 years)*	*Master study*	*Diploma study (4 years)*	*Doctoral study*
Median number of students per faculty	1,100	128	161	16
Average number of students per faculty	1,604	295	566	15
Maximum number of students per faculty	5,725	2,118	2,970	66

Table 22: Number of students 2008, faculty

Typically, bachelor students vastly contribute to the number of students according to faculty data. However, reading the data, some items show that there are some faculties with a high fraction of diploma students, too.

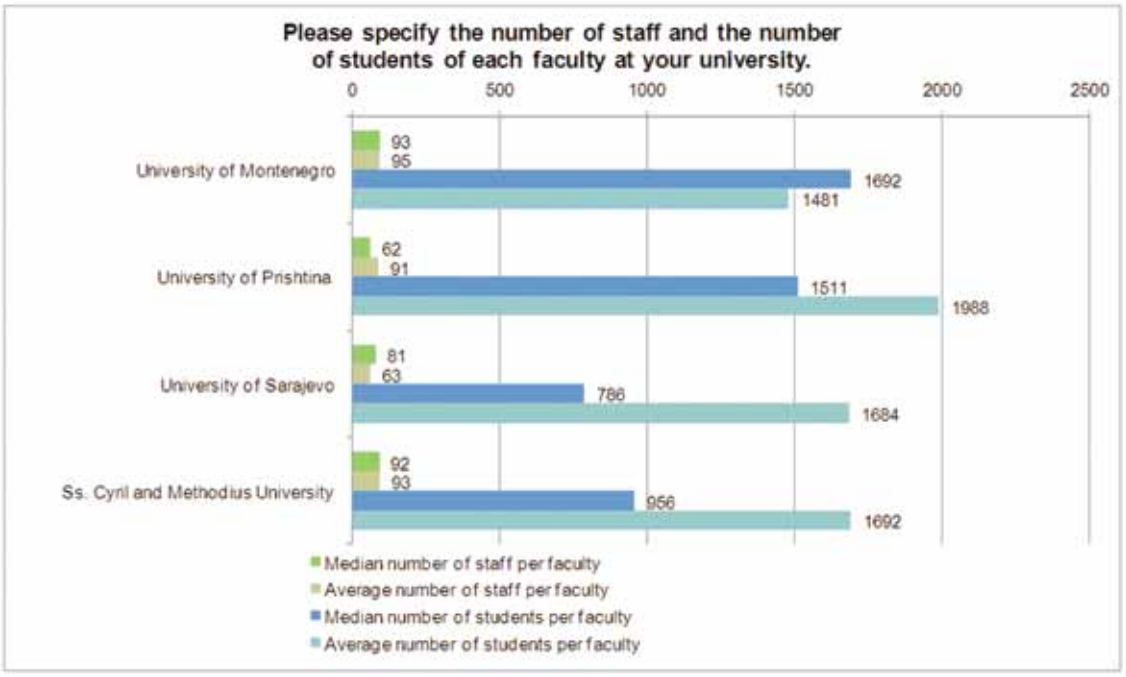


Figure 13: Number of staff & students, faculty

The table above gives a rough idea of the number of staff as well as the number of students per faculty for the assessed universities. However, the count of staff and students might not be read as a ratio, since this result needs to be computed for each faculty. These results are available for the University of Sarajevo and the Ss. Cyril and Methodius University. For Sarajevo, the median number of students per staff is 10 (average is 19), for Skopje this number is 18 (average is 28).

The evolution of student numbers does not show a clear trend, neither at university nor at faculty level. Although, at faculty level, most respondents see the numbers of students either increase or remain stable.

How has the number of students at your university evolved within the last five years?	
University of Montenegro	Number of students increased highly
University of Prishtina	Number of students increased moderately
University of Sarajevo	Number of students decreased moderately
Ss. Cyril and Methodius University	Number of students decreased moderately

Table 23: Development of student numbers, university

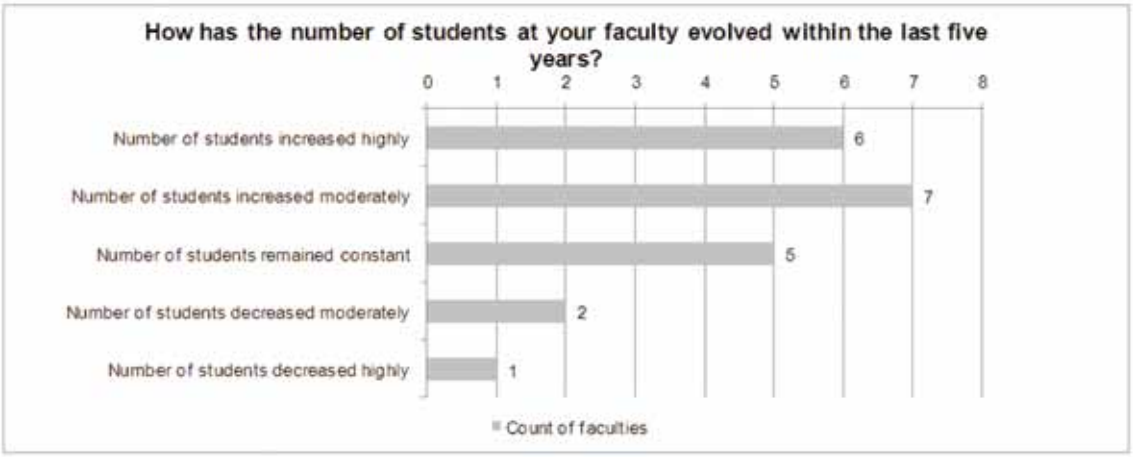


Figure 14: Development of student numbers, faculty

4.5 Number and Distribution of Staff

Please specify the number of staff of each faculty at your university.

Looking at the median number, there are 75 people working at one faculty. The minimum number of staff per faculty is 19; at maximum there are 360 persons working at one faculty. Most faculties employ five to ten people in administration with a maximum number of 46 people. The median number of employees is six.

Please specify the current number of scientific staff at your faculty.				
	Full-time staff		Part-time staff	
	Median number	Maximum number	Median number	Maximum number
Full professor	17	60	7	23
Associated professor	15	30	4	19
Lecturer	9	24	9	76
Scientific assistant	16	69	7	40

Table 24: Scientific staff, faculty

The figure and table below specify the number of administrative and scientific staff at faculty level.

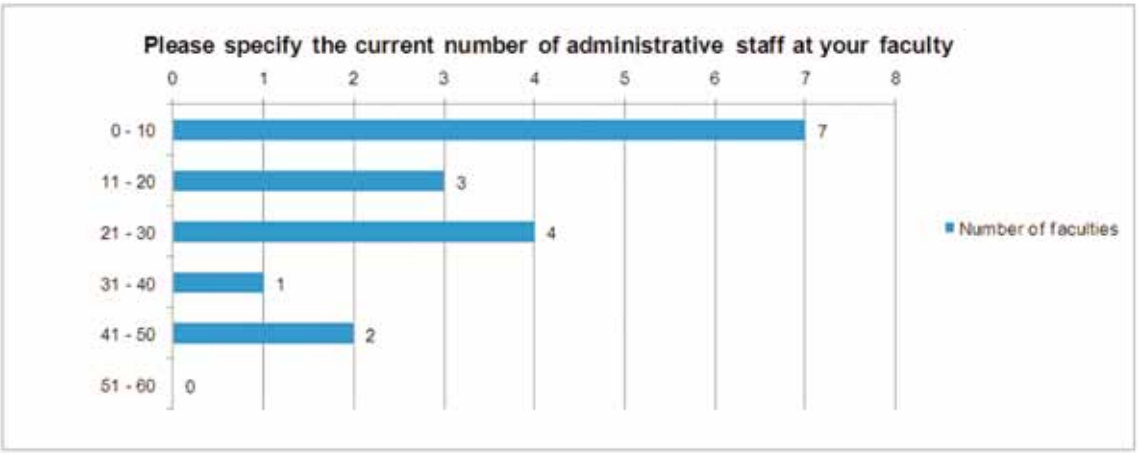


Figure 15: Administrative staff, faculty

4.6 Budget Basics

The following questions deal with budget and financial issues at university as well as at faculty level.

Please indicate the TOTAL ANNUAL BUDGET of the university including third party funds.	
University of Montenegro	no data
University of Prishtina	€ 16,000,000
University of Sarajevo	€ 50,000,000
Ss. Cyril and Methodius University	€ 60,000,000

Table 25: Total annual budget, university

Total annual budget of faculties

For those faculties which report a budget above zero, the minimum state budget is € 538,903, the maximum reported budget is € 3,000,000. The median and average faculty budget is approximately € 1,160,000 and € 1,560,000, respectively. Three faculties report their budget to be zero, seven faculties did not report on their budget.

Funding sources of the total annual budget are distributed as follows:

Funding sources of the TOTAL ANNUAL BUDGET of the universities and their percentage of the total budget.	
fixed basic budget allocated by the state/university	55-70%
fees for regulatory students	<30%
industry funding of contract research and services	<10%
services	<5%

Table 26: Funding sources for annual budget, university

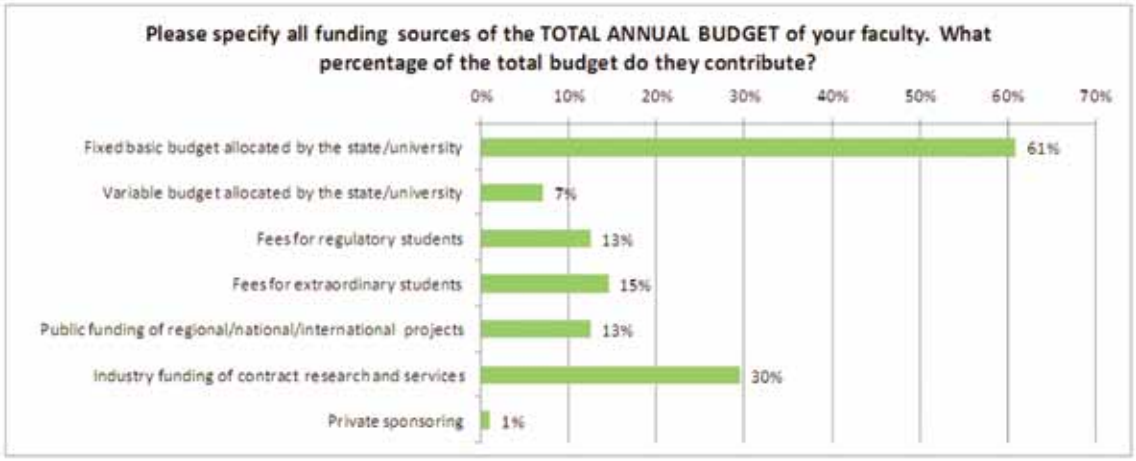


Figure 16: Funding sources for annual budget, faculty

Moreover, the following funding sources are specified: Government, Ministry of Education, Science and Technology, cooperation in international projects, different marine courses.

All assessed universities state that they are financed by the respective Ministry of Education and Science.

Please indicate the state ministry/agency providing the BASIC STATE ALLOCATED BUDGET of the university.	
University of Montenegro	Ministry of Education and Science
University of Prishtina	Ministry of Education, Science and Technology (MEST)
University of Sarajevo	Ministry of Education and Science
Ss. Cyril and Methodius University	Ministry of Education and Science

Table 27: Ministry in charge of funding, university

If applicable, please indicate the state ministry/agency providing the BASIC STATE/UNIVERSITY ALLOCATED BUDGET of the faculty!	
University of Montenegro	
Faculty of Mechanical Engineering	Ministry of Science and Education
University of Prishtina	
Faculty of Agriculture and Veterinary	Ministry of Education, Science and Technology
Faculty of Electrical and Computer Engineering	Ministry of Education, Science and Technology
University of Sarajevo	
Faculty of Electrical Engineering Sarajevo	Ministry of Education and Science
Faculty of Philosophy	Ministry of Education and Science
Ss. Cyril and Methodius University	
Faculty of Agriculture	Ministry of Finance
Faculty of Mechanical Engineering	Ministry of Finance
Faculty of Technology and Metallurgy	Ministry of Finance

Table 28: Ministry in charge of funding, faculty

Please indicate the period for the BASIC STATE ALLOCATED BUDGET of your university.
For all assessed universities the period for the basic state allocated budget is 1 year.
Please indicate the period for the BASIC STATE/UNIVERSITY ALLOCATED BUDGET of your faculty.

The same results can be shown for faculty level: All answers report that the period for the basic state/ university allocated budget of the faculty is one year.

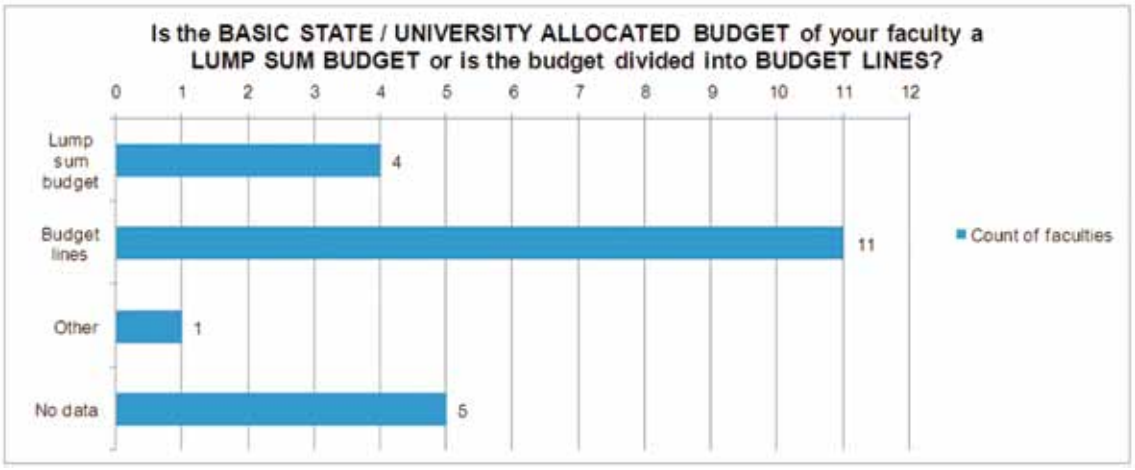


Figure 17: Type of budget, faculty

Most faculties report their budget to be divided into budget lines rather than to make use of a lump sum budget.

5 Strategic Orientation

KEY RESULTS
All PCUs report that there is very little coherent strategy concerning research and development at several different levels (national/university/faculty)
Even if there exists a national research strategy, its implementation often has low priority for the political stakeholders
Generally there is a lack of systematic documentation of priorities and strategies at all PCUs
All PCUs share the same aim to increase the number of projects, the funding possibilities and the amount of employed staff
Actual funding is now done via national channels and on an international scale (notably by EU funds)

5.1 Environmental Conditions

What general importance is attached to research activities at state level?

The University of Sarajevo states that research activities are given very low importance at state level; the University of Montenegro and Ss. Cyril and Methodius University report a rather low importance of these activities.

The University of Prishtina includes the following information: "*By law on scientific research activity the Ministry of Education, Science and Technology has been given a high priority importance to research. Therefore, about 0.7% of the national budget was foreseen to be dedicated to research activities. However so far, there is no applied specific budget for this issue at state level, yet.*"

Is there a national research strategy at state level? If yes, how is this national research strategy communicated to the general public as well as to scientific stakeholders?

The University of Montenegro and the Ss. Cyril and Methodius University report that there is a national research strategy at state level. Montenegro reports that the strategy is communicated to the general public by means of strategy/position papers, through official statements by ministries or other authorities, through press releases and by specifically addressing research institutions. Ss. Cyril and Methodius University reports that there are no strategy/position papers and official statements by ministries or other authorities whatsoever but that there are press releases and that research institutions are addressed specifically.

The University of Sarajevo does not report in detail on this question; although it reports that at state level there is generally low interest in further fostering research activities.

The University of Prishtina provides the following statement: "*No, not yet. The national research strategy is under developing and drafting process. It should be ready by end of the year 2009. Till that time, some issues dealing with research are regulated by the Law on scientific research activity of the Ministry of Education, Science and Technology.*"

Which ministry or which ministry-related institution is mainly responsible for the implementation of the national research strategy at state level?

For both Montenegro and Macedonia the Ministry of Education and Science is reportedly mainly responsible for the implementation of the national research strategy at state level. Prishtina states that the Ministry of Education, Science and Technology will be responsible for the implementation of the national research strategy at state level. The University of Sarajevo reports that the "*Ministry of Civil Affairs is in charge.*"

Does this national research strategy consist of precise targets to be hit (e.g. achievement of percentage of GDP)? If yes, please specify the main target(s) of the national research strategy.		
University of Montenegro	Yes	0.8% of GDP till 2013 with a ratio of 2:1 in favour of private and business funding
University of Prishtina	The national research strategy is not yet in place.	
University of Sarajevo	Not applicable	
Ss. Cyril and Methodius University	No	Support of scientific project; support to academic staff mobility; support to financing basic research equipment

Table 29: National research strategy

5.2 Documented Strategy

The following chapter covers the question of whether there is a general strategy for research and development at university and faculty level or not, and if yes, how this strategy is implemented.

Does your university have a general strategy document?

None of the evaluated universities report as having a general strategy document. Two additional pieces of information are given, however:

The University of Prishtina is still waiting for a national strategy in order to incorporate it into its own strategy plan. The University of Sarajevo is in the process of integration right now. Therefore, the present situation is seen as a window of opportunity for change management. This should also have positive effects on the introduction of research structures.

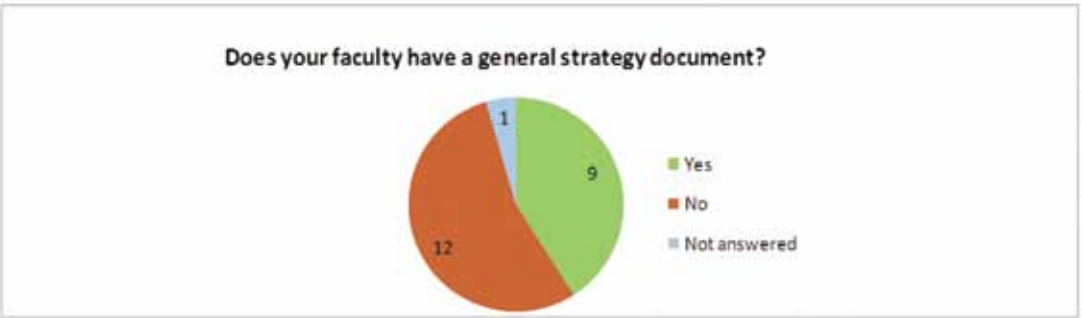


Figure 18: Strategy document, faculty

Nine faculties reported as having a general strategy document whereas twelve faculties answered in the negative.

If available, please attach the general strategy document of your faculty to this questionnaire.

Two faculties provided a general strategy document (the Prishtina Faculty of Agriculture and the Montenegro Faculty of Maritime Studies).

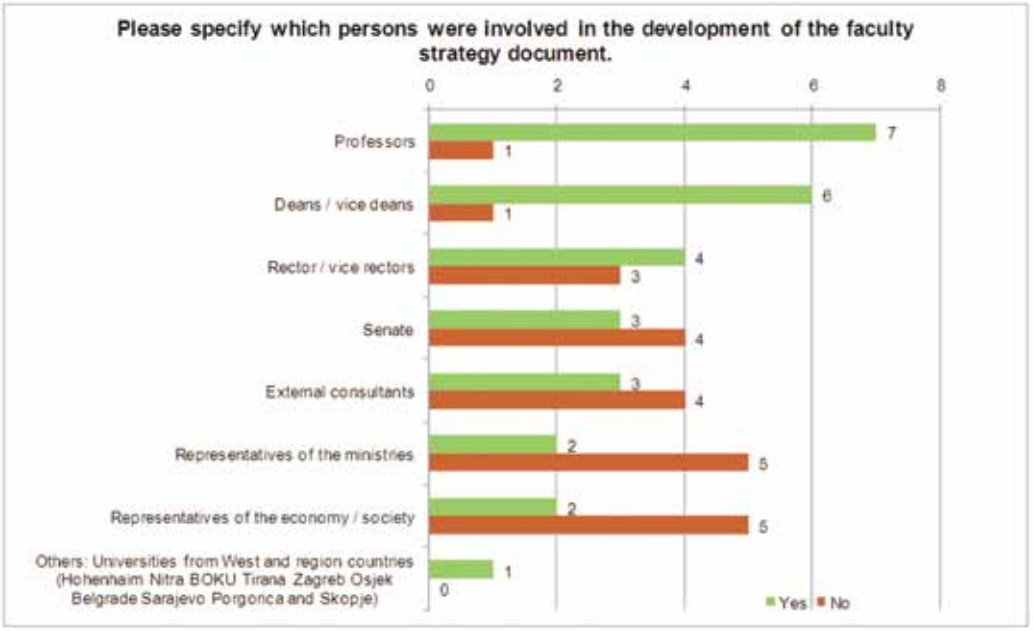


Figure 19: Persons involved in development of strategy document, faculty

At most faculties, professors and deans were involved in the development of the strategy document of the faculty. Rectors, vice rectors, senate, external consultants, etc. were less often involved.

Please specify in which year your faculty strategy document was introduced.
One faculty's strategy document was introduced as early as 1971, but according to the data provided on this item, the majority of the four faculties established their strategy documents within the current decade or even more recently.

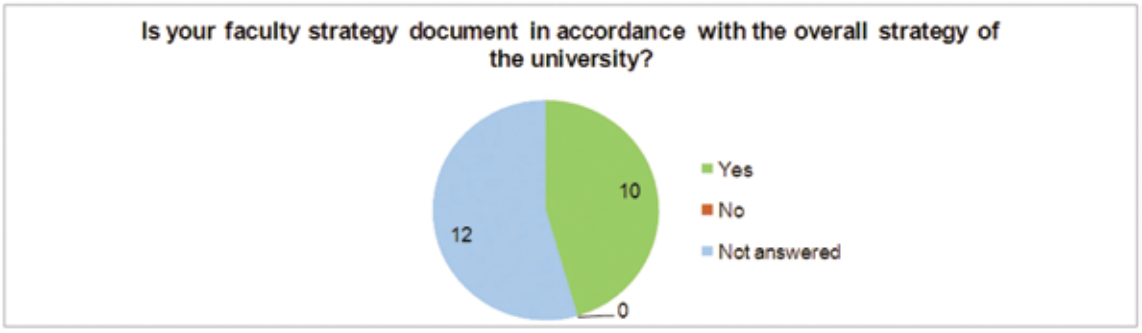


Figure 20: Accordance of faculty strategy paper with university strategy

Ten of the assessed faculties reported that their faculty strategy document was in accordance with the overall strategy of the university.

5.3 Priority of Research

Hereafter, the report deals with measurable research related objectives as an indicator for the research management at university and faculty level.

Does your university have research related objectives that are documented in written form?
At two universities research related objectives documented in written form are reported to exist.

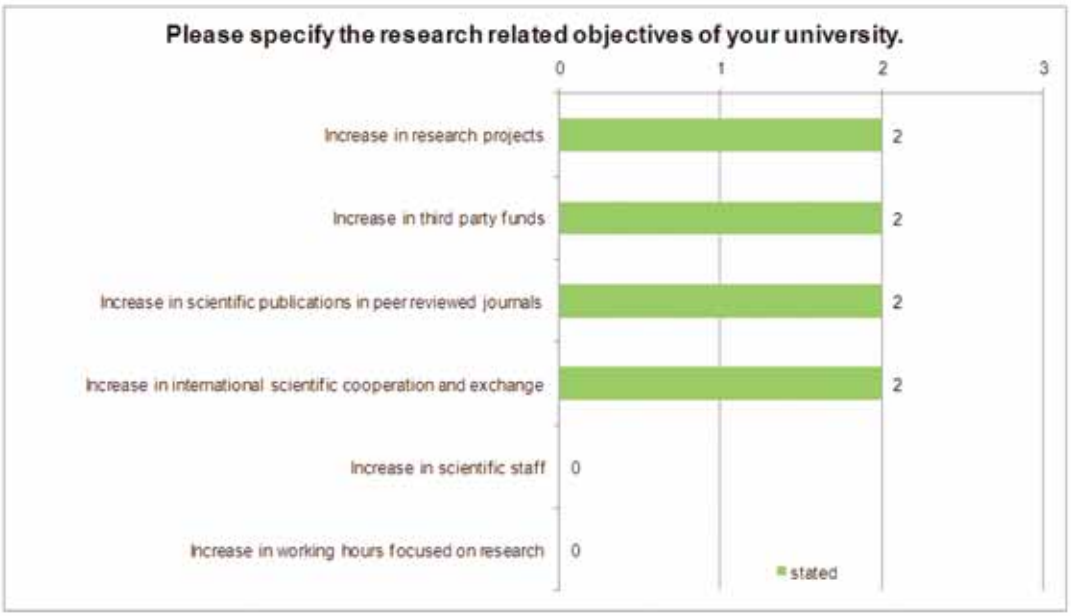


Figure 21: Research related objectives, university

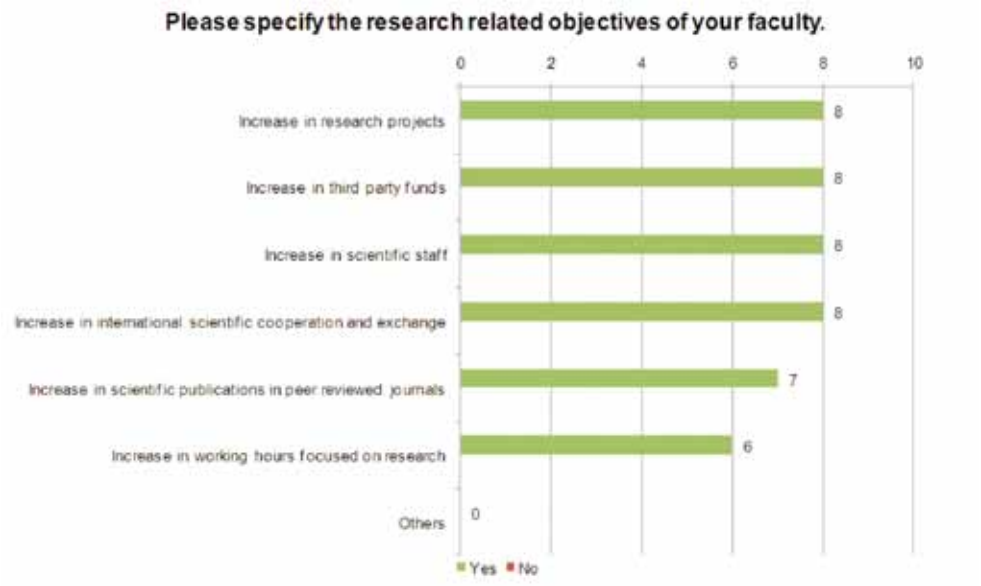


Figure 22: Research related objectives, faculty

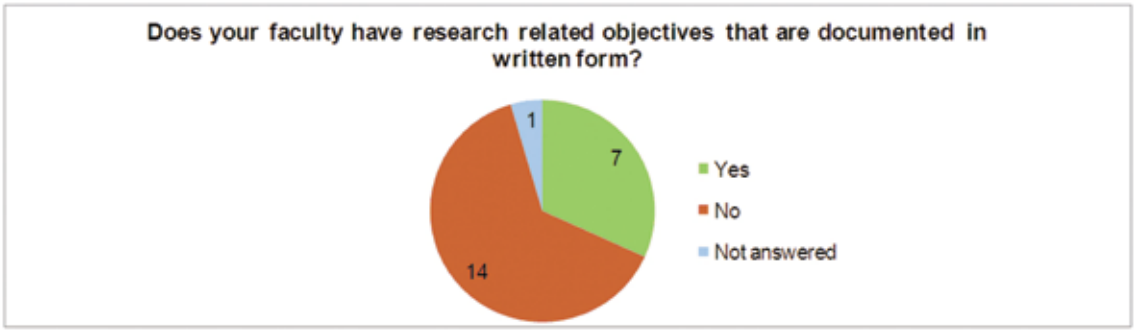


Figure 23: Document about research related objectives

Seven faculties reported as having research related objectives that are documented in written form. Nonetheless, eight faculties report on details of their research related objectives.

Are the research related objectives linked with figures (e.g. increase in third party funds by XX % until 20XX)?

Two universities answered in the affirmative, none of the assessed universities answered in the negative.

Please specify examples including figures for your university's research related objectives.		
Research related objectives	**Target value**	**Target achievement deadline (year)**
University of Montenegro		
Increase in research projects	More participation in FP7 and other project funded by EC up to 30%	2010
Increase in third party funds	-	2011
Increase in scientific publications in peer reviewed journals	More publications and defined lists of peer reviewed journals for each scientific field	2009
Increase in international scientific cooperation and exchange	-	2010
University of Sarajevo		
Increase in research projects	80	2012
Increase in third party funds	€ 500,000	2014

Increase in scientific staff	1,500	2014
Increase in scientific publications in peer reviewed journals	200	2014
Increase in international scientific cooperation and exchange	150	2012
Increase in working hours focused on research	300,000 hrs	2014

Table 30: Examples of research related objectives, university

Are the faculties involved in the defining of research related objectives of the university?
Two universities answered in the affirmative, none of the assessed universities answered in the negative.

Are the research related objectives of your faculty linked with figures (e.g. increase in third party funds by XX % until 20XX)?

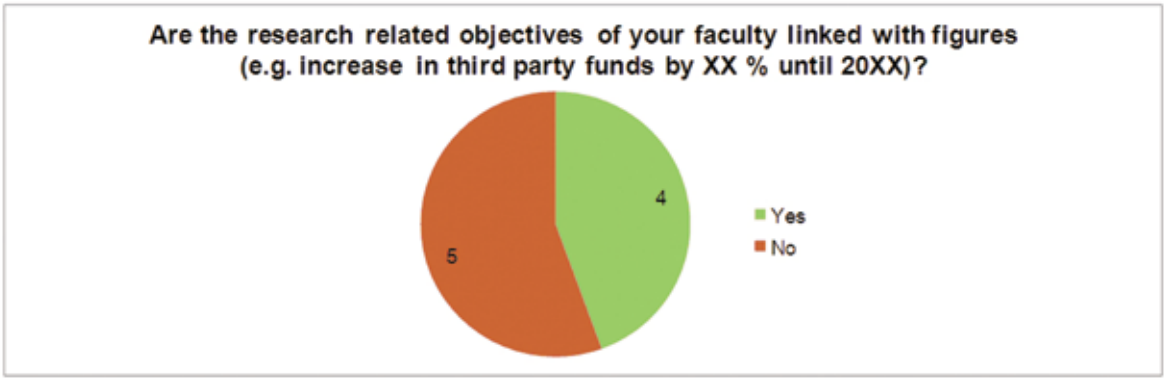


Figure 24: Research related objective related to figures

Four faculties answered in the affirmative, five answered in the negative.

Please specify examples including figures for your faculty's research related objectives.		
Research related objectives	**Target value**	**Target achievement deadline (year)**
Montenegro/Economics		
Increase in research projects	Business environment	-
Increase in third party funds	National and international funds	-

Increase in scientific staff	Academics with practical experience	
Increase in scientific publications in peer reviewed journals	International database journals	-
Increase in international scientific cooperation and exchange	EU universities and institutions	-
Increase in working hours focused on research		-

Montenegro/Maritime Studies

Increase in research projects	10	2011
Increase in third party funds	30%	2011
Increase in scientific staff	20%	2011
Increase in scientific publications in peer reviewed journals	20	2011
Increase in international scientific cooperation and exchange	100%	2011
Increase in working hours focused on research	30%	2011

Prishtina/Agriculture and Veterinary

Increase in research projects	At least three research projects per department	2013
Increase in third party funds	-	2013
Increase in scientific staff	Young scientists about 9 staff	2013
Increase in scientific publications in peer reviewed journals	Increase in scientific publications in peer reviewed journals about 75 per year	2013
Increase in international scientific cooperation and exchange	Increase in international scientific cooperation and exchange about 15 projects per year	2013

Increase in working hours focused on research	60% of working hours to focus on research	2013

Prishtina/Electrical and Computer Engineering

Increase in research projects	30%	2012
Increase in third party funds	-	2012
Increase in scientific staff	50%	2015
Increase in scientific publications in peer reviewed journals	40%	2012
Increase in international scientific cooperation and exchange	70%	2015
Increase in working hours focused on research	50%	2015

Table 31: Examples of research related objectives, faculty

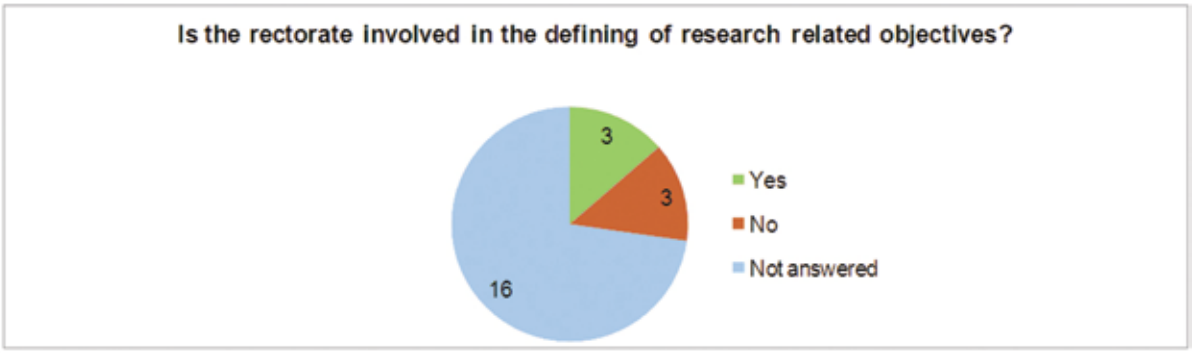


Figure 25: Involvement of rectorate in research related objectives, faculty

At three faculties the rectorate is reported to be involved in the defining of research related objectives whereas at three faculties it is not.

Does your university define individual objectives (performance agreement) for your employees in order to achieve the above-mentioned university-wide research objectives?

None of the universities answered in the affirmative, two answered in the negative.

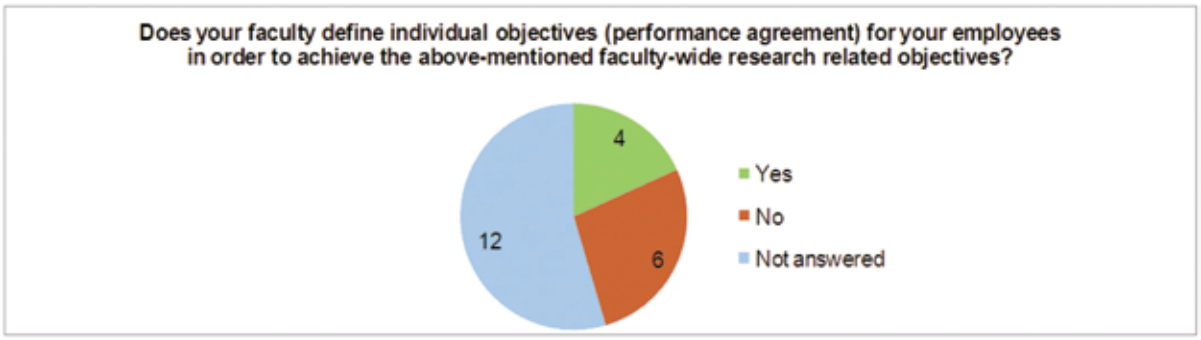


Figure 26: Individual objectives for faculty employees

Does your faculty define individual objectives (performance agreement) for your employees in order to achieve the above-mentioned faculty-wide research related objectives?
Three faculties answered in the affirmative, six answered in the negative.

UNIVERSITY COOPERATION

According to the questionnaire one of the assessed universities, the Ss. Cyril and Methodius University, has specific objectives to increase the intensity of cooperation activities at university level. The objectives are:

- Increased number of applied and funded projects
- Increased number of published papers

Is your university using any public financial support programmes for cooperation partnerships between working groups at your university and external partners?
For all of the investigated universities the use of public financial support programmes for cooperation with external partners is reported.

Please specify the most important funds your university is using.			
Title of programme	**Funding source**	**appl.[2]**	**ext.[3]**
University of Montenegro			
Regional initiative	UNEP-MAP	ec-sc	nat
Regional initiative	Union for Mediterranean	sc-sc	reg
Regional initiatives	IPA, Adriatic-Ionian Initiative	ec-sc	reg
Multilateral cooperation	Ministry of Education and Science	sc-sc	int
Bilateral cooperation	Ministry of Education and Science	both	int

University of Prishtina			
Strengthening public institutions in the field of education by securing good governance at all levels	The Austrian Development Cooperation (ADC)	both	int
Establishment of a Research Project Support Office (RPSO) at the University of Prishtina	The OSCE mission in Kosovo (OMiK)	both	int
Creating R&D Capacities and Instruments for boosting Higher Education-Economy Cooperation	Tempus IV grant (EC)	both	int
European Community (EC) under the Community Assistance for Reconstruction, Development and Stabilisation	European Agency for Reconstruction (EAR)	both	int
Bringing to Kosovo pedagogical experts from the University of Calgary to train local facilitators	Canadian International Development Agency (CIDA)	both	int
University of Sarajevo			
-	Austrian Development Cooperation (ADC)	both	int
-	BiH Federation	both	nat
-	Canton of Sarajevo	both	nat
-	Swedish International Development Cooperation Agency (SIDA)	both	int
-	Ministry of Civil Affairs BiH	both	nat
Ss. Cyril and Methodius University			
Science fund	Ministry of Education and Science	both	nat
Fund for supporting the rural development	Ministry of Agriculture	both	nat
Support of business incubators	Agency for Promotion of Entrepreneurship	ec-sc	nat
Support of clusters	Ministry of Economy	ec-sc	nat

Table 32: Most important funds for university

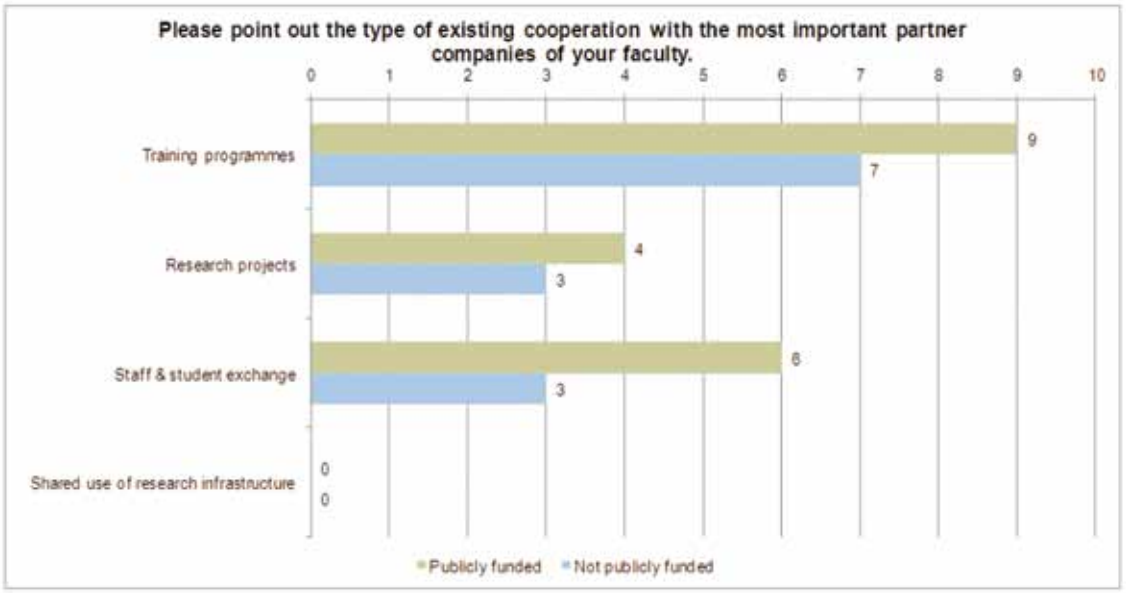


Figure 27: Cooperation with most important partner, faculty

For most faculties, cooperation with partner companies concerns training programmes; staff and student exchange figures are somewhat less prominent. A shared use of research infrastructure with partner companies is reported for none of the faculties. Subsequently, an enumeration of the most important partner companies is shown:

Please specify the 3 most important partner companies (highest project volumes, long-term partnership) of your faculty.	
Adriatic shipyard	Faculty of / University ofMaritime Studies / Montenegro
Agency for entrepreneurship promotion	Mechanical Engineering / Skopje
Association of farmers	Veterinary Medicine / Skopje
BH Telecom	Electrical Engineering / Sarajevo
ENSI, Oslo, Norway	Architecture / Montenegro
FDS, Sarajevo	Agriculture and Food / Sarajevo
GTZ - German Technical Support	Architecture / Montenegro
Hermes Soft Lab	Electrical Engineering / Sarajevo
HiCAD, Novi Sad, Serbia	Architecture / Montenegro
IPKO	Electrical and Computer Eng. / Prishtina
KEK	Electrical and Computer Eng. / Prishtina
Macedonian power company	Mechanical Engineering / Skopje
MILKOS, Sarajevo	Agriculture and Food / Sarajevo
Port of Bar	Maritime Studies / Montenegro
Port of Kotor	Maritime Studies / Montenegro
Power Utility	Electrical Engineering / Sarajevo
PTK	Electrical and Computer Eng. / Prishtina
Stocarstvo	Veterinary Medicine / Skopje
ZIM, Zenica	Agriculture and Food / Sarajevo

Table 33: Most important partner companies, faculty

The details for existing cooperation projects with partner companies are listed as follows:

Name of company	*Location of company*	*Publicly funded*	*Funding source/ programme*	*Field of knowledge*
Training programmes				
A driatic shipyard (Univ. of Montenegro)	Bijela	yes	Faculty	Earth and related environmental sciences
BH Telecom (Univ. of Sarajevo)	Sarajevo, BiH	no	BH Telecom	Other Natural Sciences
Development Fund of Montenegro (Univ. of Montenegro)	Podgorica	-	-	
Directorate for small and medium sized enterprises (Univ. of Montenegro)	Podgorica	-	-	
ENSI (Univ. of Montenegro)	Oslo, Norway	yes	Company funds	Environmental Biotechnology
HiCAD (Univ. of Montenegro)	Novi Sad, Serbia	yes	Participation fee	Environmental Biotechnology
Ipko (Univ. of Prishtina)	Prishtina	no	FIEK – Ipko	Humanities
Macedonian power company (Univ. of Skopje)	Skopje	yes	-	Other Natural Sciences and Engineering and Technology
MILKOS (Univ. of Sarajevo)	Sarajevo	no	-	
Ministry of Defense (Univ. of Skopje)	Skopje	yes	Embassy of Norway	Other Agricultural Sciences
Port of Bar (Univ. of Montenegro)	Bar	yes	Faculty	Earth and related environmental sciences
Port of Kotor (Univ. of Montenegro)	Kotor	yes	Faculty	Chemical Engineering
Power Utility (Univ. of Sarajevo)	Sarajevo, BiH	no	Power Utility	
Pronet (Univ. of Prishtina)	Prishtina	no	FIEK-Pronet	
PTK (Univ. of Prishtina)	Prishtina	yes	FIEK – PTK	
Research projects				
Bh Telecom (Univ. of Sarajevo)	Sarajevo BiH	no	-	Other Natural Sciences

GTZ German Technical Support (Univ. of Montenegro)	Montenegro, Podgorica	yes	Company funds	Environmental Biotechnology
Hermes Soft Lab (Univ. of Sarajevo)	Sarajevo BiH	no	-	Other Natural Sciences
Port of Kotor (Univ. of Montenegro)	Kotor	yes	Faculty/Port	Chemical Engineering
Power Utility (Univ. of Sarajevo)	Sarajevo BiH	no	-	Other Natural Sciences

Staff & student exchange

Adriatic shipyard (Univ. of Montenegro)	Bijela	yes	Faculty	Earth and related environmental sciences
Hermes Soft Lab (Univ. of Sarajevo)	Sarajevo BiH	-	-	Other Natural Sciences
KEK (Univ. of Prishtina)	Prishtina	yes	FIEK	
MILKOS (Univ. of Sarajevo)	Sarajevo	no	-	
Port of Bar (Univ. of Montenegro)	Bar	yes	Faculty	
PTK (Univ. of Prishtina)	Prishtina	yes	FIEK	
ZIM (Univ. of Sarajevo)	Zenica	no	Budget	

Shared Use of Research Infrastructure

State Agency for Standardisation (Univ. of Skopje)

Table 34: Details of existing cooperation

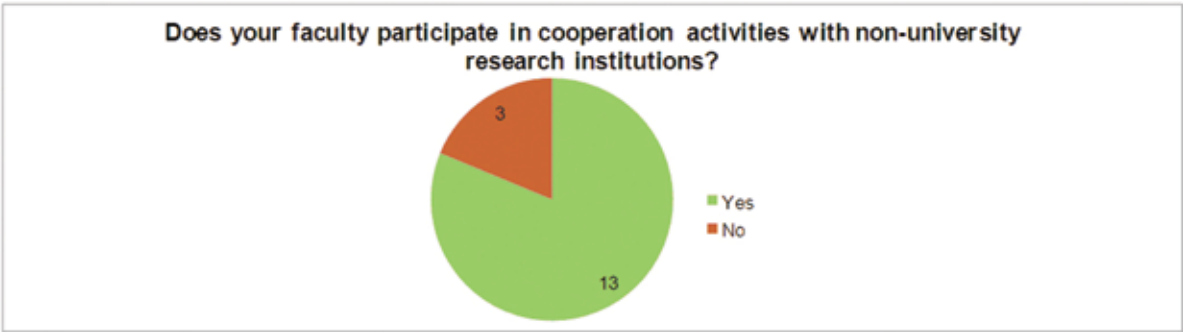


Figure 28: Cooperation with non-university research institutions, faculty

At 13 of the participating faculties (81%) specific objectives to increase the intensity of cooperation activities at faculty level are reported. Three faculties (19%) state that they do not have such objectives. In the following two tables the stated objectives as well as instruments to reach the

objectives are listed.

Does your faculty have specific objectives to increase the intensity of cooperation activities at faculty level? Please specify these objectives.
Acceptance in the Prague Dean Network and cooperation with members
Application for Tempus Project activities with the Department of Archaeology in Ljubljana
Application for Tempus Project activities with the Department of Ecology and Environmental Protection
Cooperation between institutions at a high level
Cooperation with companies
Curriculum design
Development of new adult education programmes for different target groups.
Establish new and more attractive curricula programmes based on the needs of industry and society
Improvement of teaching quality at university, Tempus Project
Improvement of the laboratory infrastructure
Improvement of the library service / online full text database
Increase in national and international research partnerships
Joint research projects
Joint research with companies
Provide good bases for transfer of technology to society
Research activities
Research in Marine Engineering
Research in Maritime Sciences
Research in Maritime Transport
Sharing of research facilities
Sharing information during meetings
Make aims of study programme visible
Staff/student exchange, Internships
Student exchange
To improve the capability of applying for international research funding
To improve the quality of education

Table 35: Objectives to increase cooperation activities, faculty

What instruments does your faculty use in order to reach these specific objectives (e.g. road shows, joint publication of papers)?
Adult education needs assessment at university and non-university level
Advisory council of faculty (members are public institutions / stakeholders)
Annual reports
Communication programmes
Cooperation
Engagement of experts in the teaching process
Engagement of experts of companies in the teaching process and professional development
Engaging young people in research and cooperation activities
Exchange programme for administration, management and teaching staff
Increase practical approach
Industrial advisory council of faculty (member are private and public companies/ stakeholders)
Initiation to be a part of the teaching process
Internship programmes
Joint applications
Joint master and PhD thesis
Joint meetings
Joint publication of books
Joint publication of papers
Local staff support in professional development
Printing publications
Programme and teaching staff exchange, joint research projects
Promotions books
Providing human capacities (faculty staff)
Providing infrastructure capacities (laboratories, seminar rooms and other equipment)
Public debates
Research activities for agriculture fields meeting the needs of the respective industry
Scientific projects
Seminars
Sharing information during meetings
Staff exchange
Strengthening of exchange programmes for students from European universities

Table 36: Instruments for reaching cooperation objectives, faculty

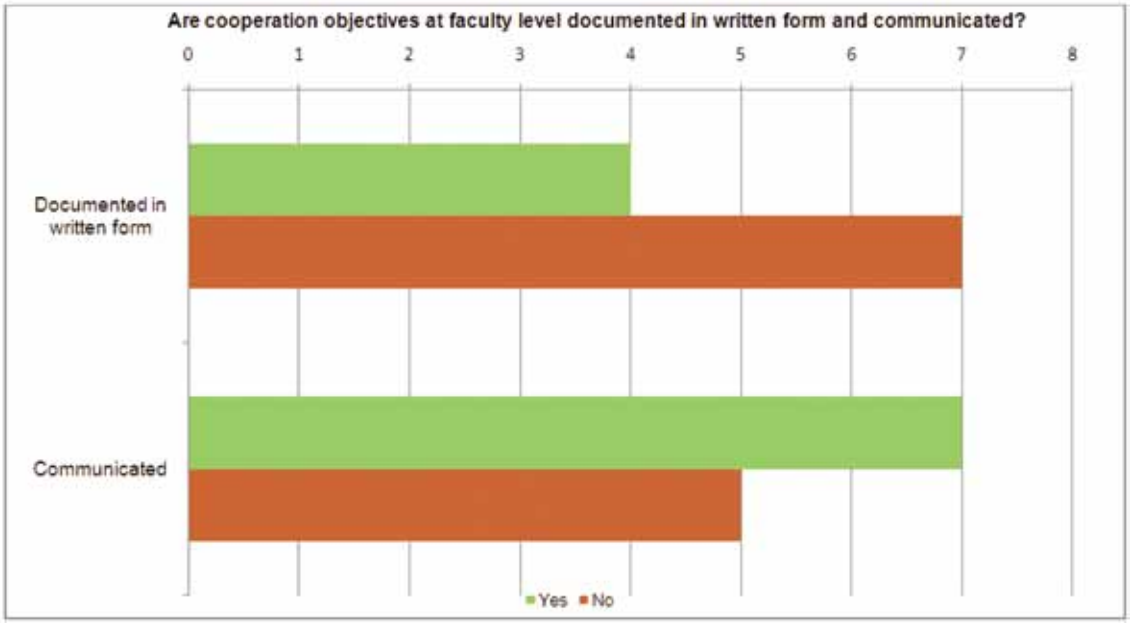


Figure 29: Documents of cooperation objectives, faculty

Seven respondents report their cooperation objectives as being communicated, four reported them as being documented in written form. At five to seven faculties the cooperation objectives are stated as neither being communicated, nor documented.

6 Finance

KEY RESULTS
The allocation of the overall PCU budget for each faculty is by majority non-performance oriented
Staff costs are nearly completely covered by the basic funding of the PCUs
In general for all PCUs there is nearly no third party funding of scientific staff
If external funding takes place, it is mostly at international level (e.g. European Commission)
In contrast, only a very low percentage of the budget is reserved for research activities
PCUs do not – with a few exceptions – provide any research based services for economy related institutions

6.1 Basic Budget

Is the BASIC STATE ALLOCATED BUDGET of your university a LUMP SUM BUDGET or is the budget divided into BUDGET LINES?	
University of Montenegro	Lump sum budget
University of Prishtina	Budget lines
University of Sarajevo	Lump sum budget
Ss. Cyril and Methodius University	Budget lines

Table 37: Basic state allocated budget, university

Both alternatives are found within the answers with a ratio 50:50.

Is the basic state allocated budget of your university performance-dependent?

The University of Montenegro is the only university for which the basic state allocated budget is reportedly performance-dependent; it depends on the number of students enrolled.

At three of the evaluated universities the basic state allocated budget is reported to be dependent on the number of staff employed: for the University of Sarajevo, the Ss. Cyril and Methodius University, and for the University of Montenegro.

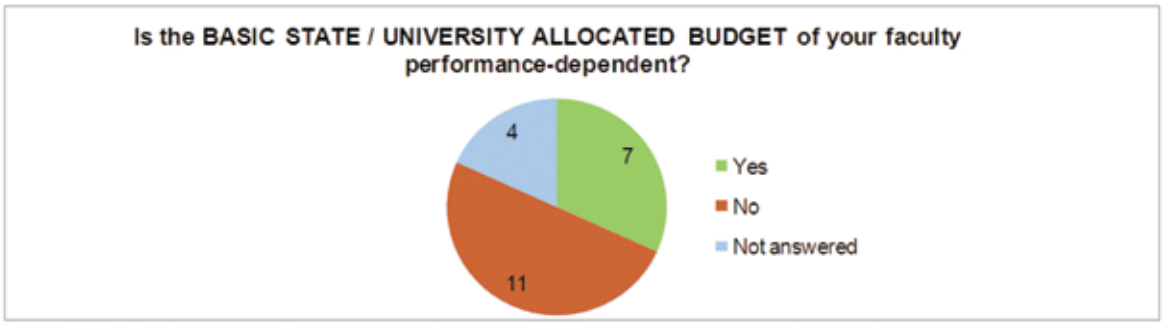


Figure 30: Allocated budget performance dependent, faculty

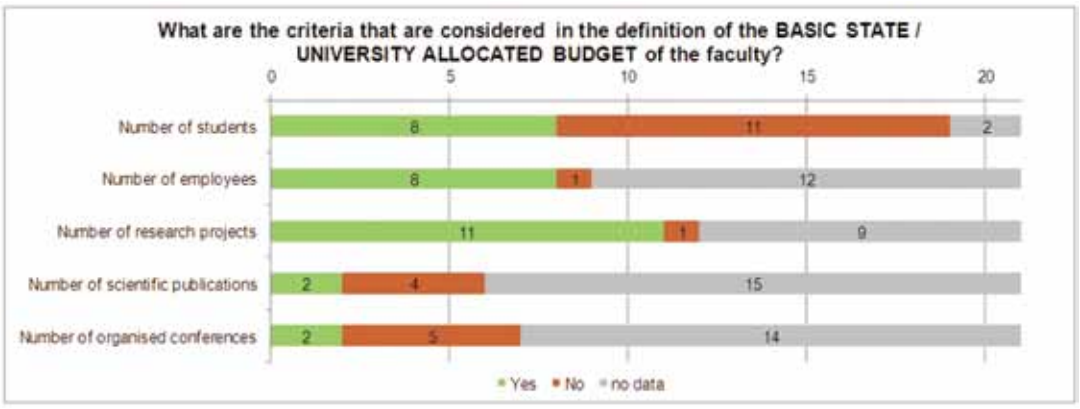


Figure 31: Criteria for allocation of budget, faculty

For about half of the faculties the number of research projects, students and employees are reportedly the criteria considered in the definition of their basic state or university allocated budget.

Please specify which pathway is used to define the BASIC STATE ALLOCATED BUDGET of your university.

All investigated universities specified the pathway used to define their basic state allocated budget as follows: Budget estimate by university –> negotiation between university and ministry –> allocation

At faculty level, the pathways are somewhat more heterogeneous:

Please specify which pathway is used to define the BASIC STATE / UNIVERSITY ALLOCATED BUDGET of your faculty.	
University of Montenegro	
2 faculties	Budget estimated by ministry –> negotiation between university and ministry –> allocation by ministry
1 faculty	Budget estimated by university –> negotiation between faculty and university –> allocation by university
1 faculty	Budget estimated by ministry –> negotiation between faculty and ministry –> allocation by ministry
University of Prishtina	
5 faculties	Budget estimated by faculty –> negotiation between faculty and university –> allocation by university for all faculties
University of Sarajevo	
3 faculties	Budget estimated by ministry –> negotiation between faculty and ministry –> allocation by ministry
Ss. Cyril and Methodius University	
3 faculties	Budget estimated by ministry –> negotiation between faculty and ministry –> allocation by ministry
1 faculty	Budget estimated by faculty –> negotiation between faculty and university –> allocation by university

Table 38: Pathway used to define allocated budget, faculty

Budget control is organised in different ways within the assessed universities:

What percentage of the TOTAL ANNUAL BUDGET of the university is controlled centrally by the rectorate?	
University of Sarajevo	16%
University of Prishtina	100%
Ss. Cyril and Methodius University	100%
University of Montenegro	70%

Table 39: Percentage of budget controlled by rectorate

The University of Sarajevo states not being a fully integrated university to date, therefore every faculty has its own budget.

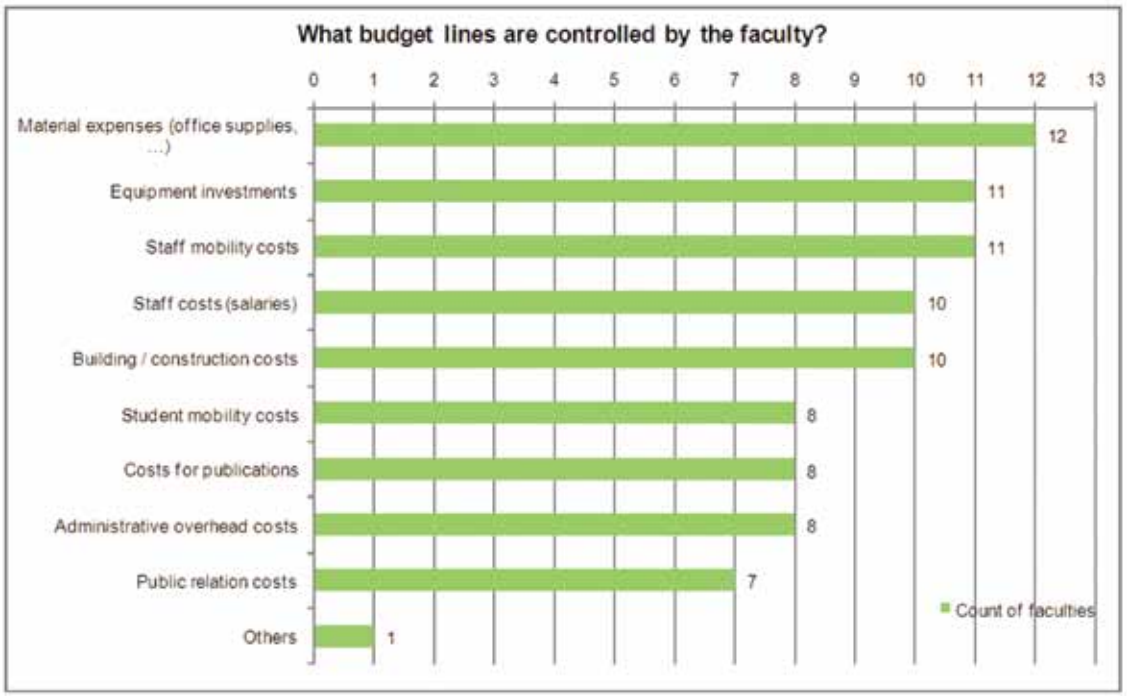


Figure 32: Budget lines controlled by faculty

Which of the following expenses of your university are covered by the basic funding (as opposed to third party funding?)				
	University of Sarajevo	**Ss. Cyril and Methodius University**	**University of Montenegro**	**University of Prishtina**
Staff costs (salaries)	90% 0%		100% 70%	100% 70%
Equipment investments	10%		80%	95%
Material expenses (office supplies)	0%		95%	95%
Building / construction costs	0%	no sufficient data	40%	40%
Staff mobility costs	0%		40%	40%
Student mobility costs	0%		100%	100%
Costs for publications	0%		100%	100%
Public relations costs	0%		90%	100%
Administrative overhead costs				

Table 40: Coverage of expenses through basic funding, university

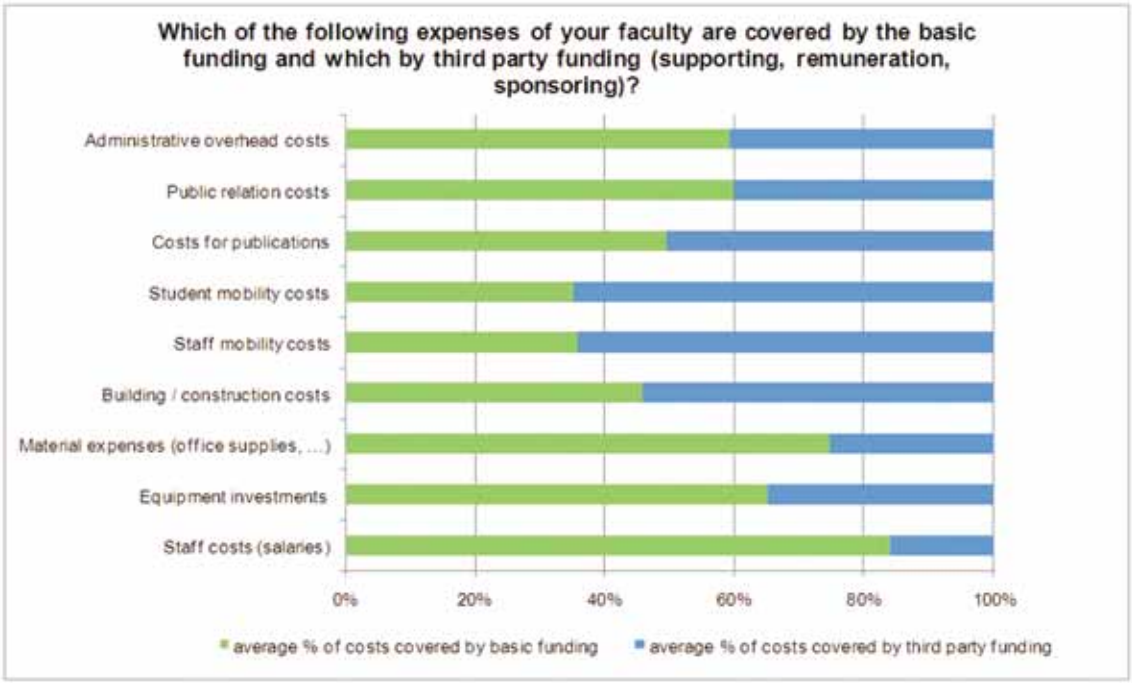


Figure 33: Coverage of expenses through basic funding, faculty

As far as faculties are concerned, staff costs, administrative overhead costs, material expenses and public relation costs are most often covered by basic funding.

6.2 Special Coverage

Does your university use third party funds to finance science-supporting staff?

All of the four universities generally report that they use third party funds to finance science-supporting staff. A minority of nine faculties reportedly uses third party funds in order to finance science-supporting staff; the majority of ten does not.

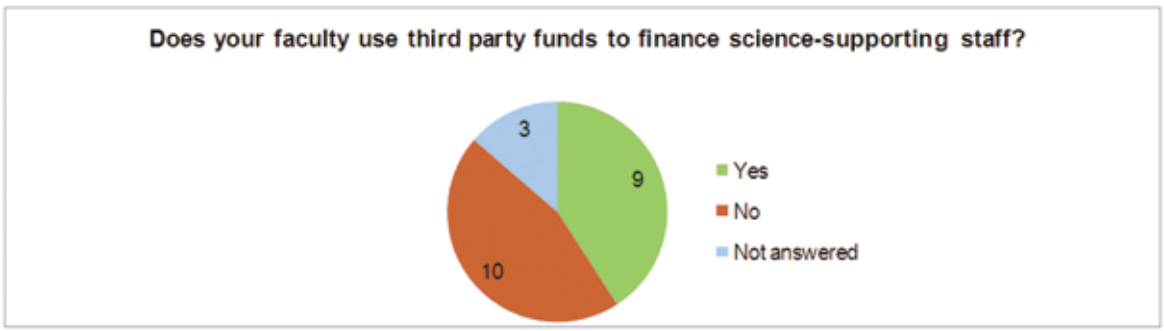


Figure 34: Coverage of scientific staff through third party funding, faculty

6.3Research Budget

Does your university reserve a specific budget for RESEARCH activities? What percentage of the TOTAL ANNUAL BUDGET of the university is reserved for research activities?		
		Who is authorised to allocate the research budget?
University of Montenegro	no	-
University of Prishtina	yes, 5%	University
University of Sarajevo	yes, 5%	University and Faculty
Ss. Cyril and Methodius University	no	University and Faculty

Table 41: Special budget for research activities, university

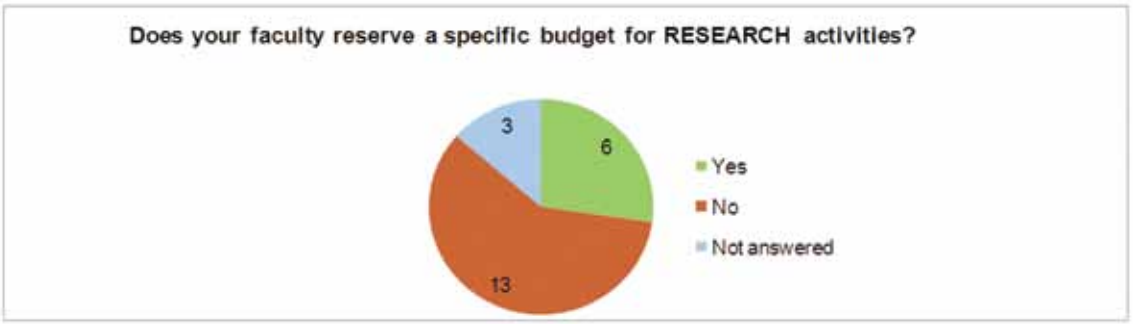


Figure 35: Special budget for research activities, faculty

13 out of 19 faculties state to have no specific budget of any kind reserved for research activities.

What percentage of the TOTAL ANNUAL BUDGET of the faculty is reserved for research activities?
Those faculties which do reserve a specific budget for research activities report this budget to amount to between 7% and 30% of the total annual budget.

Did you participate (start, continue or finalise) at university level (contract is signed with university) in any kind of publicly funded research projects with national and/or foreign universities and / or non-university research institutions within the last five years?

	Yes	No
Universities	2	2

Table 42: Publicly funded research project with other entity in last 5 years

Two universities report participating in or having participated in publicly funded cooperational research projects. The University of Montenegro and the Ss. Cyril and Methodius University report details on those projects which are provided in the table below.

Publicly funded research projects with national and/or foreign universities and/or non-university research institutions within the last five years:					
Project title	*Duration*	*Project partners*	*Project volume (€)*	*Publicly funded*	*Funding source(s)*
University of Montenegro					
South Adriatic, chemical investigation of water and sediments	1-2 years	Institute for marine biology	67,000	yes	-
Generalised time-frequency distributions: multimedia application	1-2 years	-	85,000	yes	-
Synthesis and physical-chemical characterisation of new ditio compounds, derivatives of EDTa. Application in the pharmacological industry	1-2 years	Biotechnical faculty	27,000	yes	-
Measuring of turbulence flow in channels	1-2 years	-	37,000	yes	
Improvement of environmental management by using the system of balanced aims and BSc software	1-2 years	-	45,000	yes	-

Ss. Cyril and Methodius University

South-East European Research and Education Network	3-5 years	Greek and Research and Technology Network	3,000,000	yes	EU
Sustainable eco-effective production technology and management of Biocomposites on plant renewable resources	3-5 years	ICTP-CNR, Italy	1,800,000	yes	EU
Reinforcements of the WBC research capacities for food quality characterisation	3-5 years	-	600,000	yes	FP7
COMPETENCE - Matching competences in higher education and economy	3-5 years	University of Zenica, Bosnia & Herzegovina; University of Podgorica, Montenegro; KaHo Sint-Lieven, Gent, Belgium; University of Girona, Spain; University of Novi Sad, Serbia; FH Joanneum, Austria; WUS Austria, Austria	681,000	yes	Tempus
Creating R&D Capacities and instruments for boosting Higher-Education Economy Cooperation	3-5 years	University of Leoben, Austria; University of Oxford, UK; University of La Sapienza, Spain; University of Sarajevo, Bosnia and Herzegovina; University of Prishtina, Kosovo; Austin Pock & Partners, Austria; WUS Austria, Austria	957,856	yes	Tempus

Table 43: Details on publicly funded research projects with other entity in last 5 years

Did you participate (start, continue or finalise) at university level (contract is signed with university) in any kind of joint research projects with national and/or foreign economy related institutions (spin-offs, small & medium sized companies, large sized companies) within the last five years?

	Yes	No
Universities	2	2

Table 44: Joint research projects with economy related institutions, university

The University of Montenegro and the Ss. Cyril and Methodius University report participating in or having participated in joint research projects with economy related institutions. Only the University of Montenegro specifies details on such projects provided in the following table:

Joint research projects with national and/or foreign economy related institutions within the last five years:					
Project title	*Dura-tion*	*Project partners*	*Project volume (€)*	*Publicly funded*	*Funding source(s)*
University of Montenegro (only university reporting on this topic)					
Flocculants' adsorptive capacity impact on process of red mud segregation in Bayer process	1-2 years	Faculty of Metallurgy and Chemical Technology	35,000	yes	Aluminium production company Podgorica
Investigation of optimal linkage between maritime and continental transport systems	1-2 years	Maritime Faculty	55,000	yes	Ministry of Transport
Farm management as a function of organic farming development	1-2 years	Biotechni-cal Faculty	66,000	yes	Ministry of Agriculture

Table 45: Details on joint research projects with economy related institutions, university

Did you provide at university level (contract is signed with university) any kind of research services on a contract basis (e.g. certificates, measurements or analysis services, research assignment) to economy related institutions (spin-offs, small & medium sized companies, large sized companies) within the last five years?

	Yes	No
Universities	0	4

Table 46: Research service for economy related institutions, university

Did you provide at university level (contract is signed with university) any kind of knowledge and technology based consulting services to economy related institutions (spin-offs, small & medium sized companies, large sized companies) within the last five years?

	Yes	No
Universities	0	4

Table 47: Consulting service for economy related institutions, university

Did you organise at university level science communications and research related information for the general public within the last five years?

	Yes	No
Universities	1	3

Table 48: Science communication to general public, university

The Ss. Cyril and Methodius University reports having organised the following external communication activities:

Open day
Job and education fairs
Taster days for pupils and students
Dialogue between academia and society
Exhibitions

Table 49: External communication activities, Ss. Cyril and Methodius University

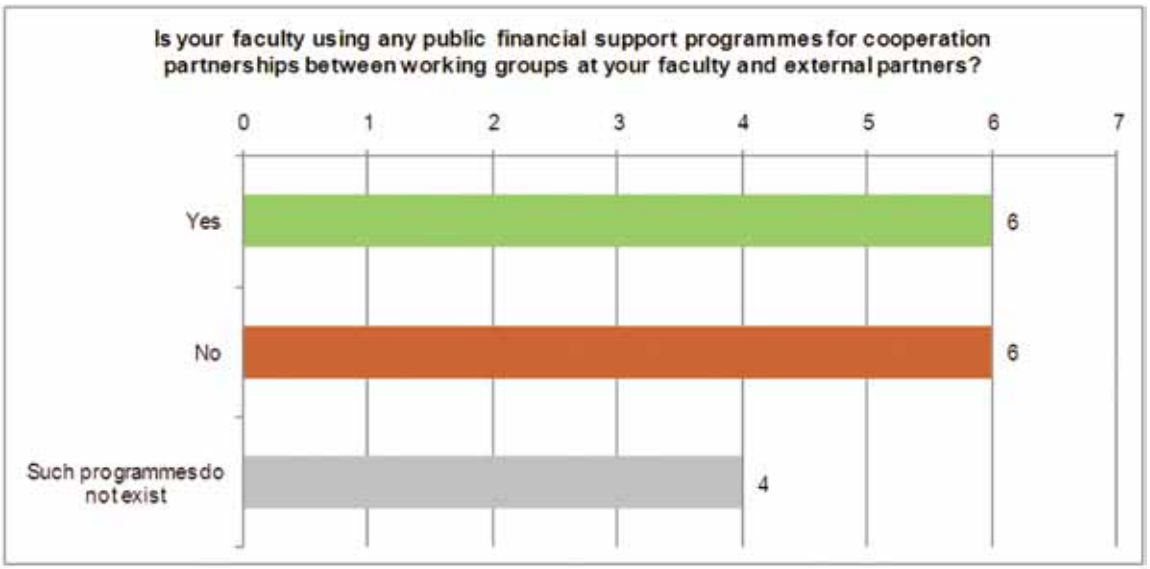


Figure 36: Public financing for cooperation between faculty and external partners

According to the questionnaire, six faculties are using public financial support programmes for research partnerships whereas six faculties are not using such programmes.

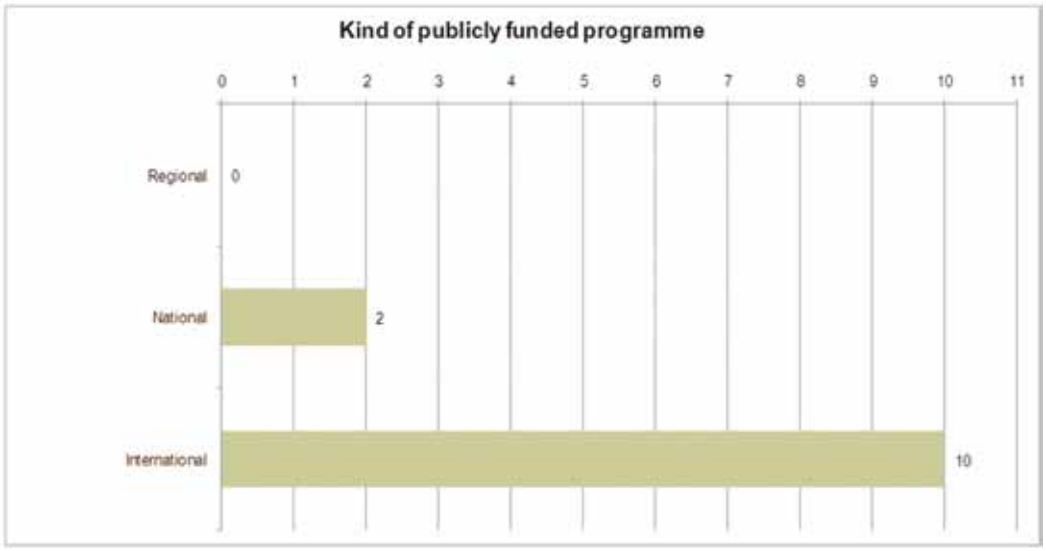


Figure 37: Kind of publicly funded programme

The public funding programmes are mostly internationally oriented. Hereafter, a list of the stated public funding programmes and the funding sources is given.

Please specify the most important public funding programmes your faculty uses.		
Faculty	**Title of programme**	**Funding source/ programme**
Agriculture and Veterinary / Prishtina	Animal Welfare	External Affairs Department - UK
Philosophy / Sarajevo	BASILEUS	EC
Mechanical Engineering / Skopje	CEEPUS	Ministry of Education and Science
Agriculture and Veterinary / Prishtina	TEMPUS: Developing curricula for Biotechnology studies	EC
Maritime Studies / Montenegro	Development of national research domain	Ministry of Science
Maritime Studies / Montenegro	Development of university research domain	University of Montenegro
Agriculture and Veterinary / Prishtina	Kosovo and Austria Partnership in Agriculture	Austrian government
Mechanical Engineering / Skopje	Science fund within Ministry of Education and Science	Governmental programme
Agriculture and Veterinary / Prishtina	SEEDN-et Plant Genetic Resources	Swedish government
Agriculture and Veterinary / Prishtina	TEMPUS: Support network for improvement of the strategic planning	EC
Agriculture and Veterinary / Prishtina	TEMPUS	EC
Natural and Mathematical Sciences / Prishtina	Support of Higher Education	ADC

Table 50: Most important funding programme, faculty

6.4 Monetary Surplus from Research Projects

Is the disposition of monetary surplus generated by research projects tied to a specified use?

	Yes	No
Universities	3	1

Table 51: Monetary surplus tied to specific use, university

For the University of Prishtina the monetary surplus generated by research projects is not tied to a specified use. For the other universities the specific uses figure as follows:

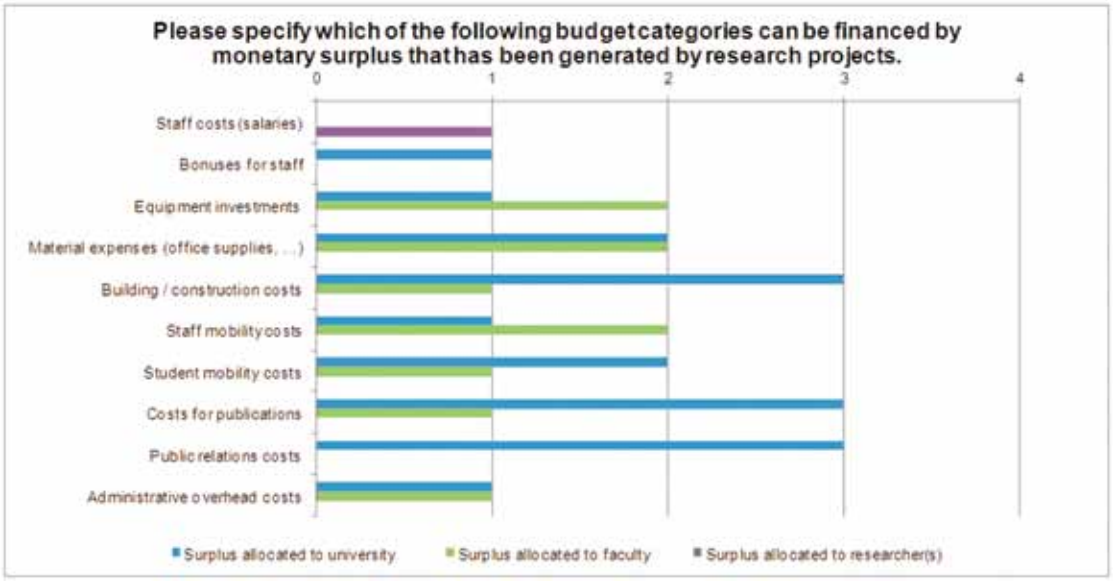


Figure 38: Budget categories financed by monetary surplus, university

In the following, the disposition of monetary surplus generated by research projects at faculties is described.

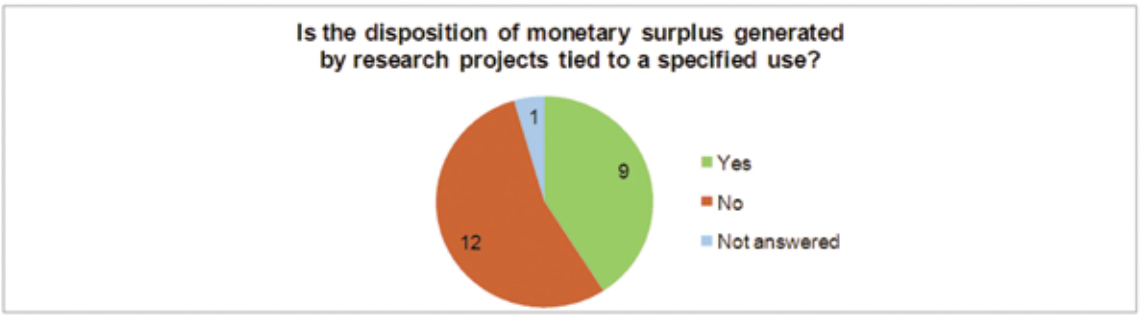


Figure 39: Disposition of money surplus generated by research projects, faculty

Typically, extensive parts of the surplus from research projects are distributed among researchers or allocated to the faculty. However, there is quite a lot of deviation concerning the allocation of these funds, which means that faculties report quite different allocation schemes.

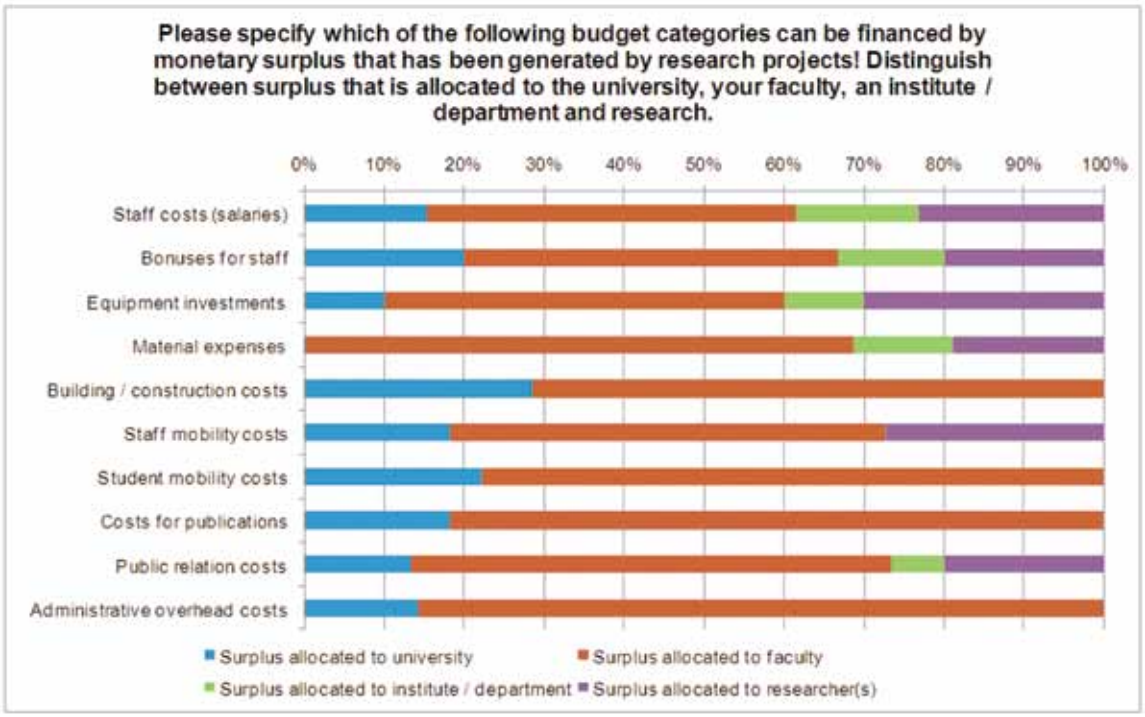


Figure 40: Budget categories financed by monetary surplus, faculty

On average, for all listed budget categories most of the surplus generated by research projects is allocated to the faculties.

6.5 Funding Programmes

Are there existing funding programmes for research activities?

Only the Ss. Cyril and Methodius University reported that there are funding programmes for research activities. The details are listed as follows.

Please specify relevant programme titles and further details!				
Title of programme	*Funding institution*	*Regional/national/ international programme*	*Applicable to science community*	*Usage rate*
Ss. Cyril and Methodius University				
Programme for support of scientific and research projects	Ministry of Education and Science	National	Universities, non-university research institutions	often used
Fund for support of rural development	Ministry of Agriculture	National	Universities, non-university research institutions	often used

Support of development of national clusters	Ministry of Economy	National	Any cooperation	rarely used
Support of business incubators	Ministry of Economy	National	Any cooperation	often used

Table 52: Relevant funding programmes for research activities, Ss. Cyril and Methodius University

Did the budget for public funding of research activities increase since the year 2000?

The University of Montenegro reported a budget increase for regional, national, as well as international funding programmes. Ss. Cyril and Methodius University reported a budget increase for international funding programmes. Universities of Sarajevo and of Prishtina did not provide any data.

Does your university use any regional, national or international funding programmes for research activities?

All four universities are using regional, national or international funding programmes for research activities.

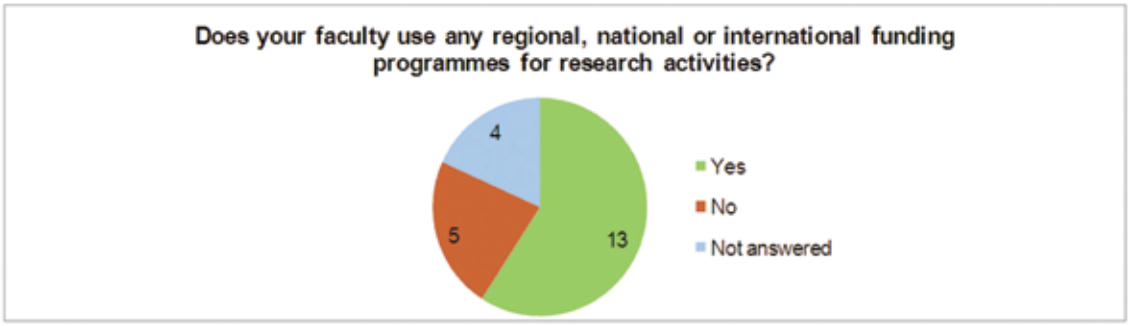


Figure 41: Use of funding programmes for activities, faculty

The majority of faculties uses regional, national or international funding programmes for research activities. The details on the used programmes read as follows:

Please specify the most important public funding programmes your faculty uses.		
Title of programme	*Funding institution*	*Regional/national international*

University of Montenegro

CEEPUS		int
Curriculum Innovations	ADC	int
Development of BSc Accounting and Finance Degree for the University of Montenegro"	EC	int
Erasmus		int
Germany	DAAD	-

IPA Adriatic Regional Programme	EC	reg
IPA Cross-Border Programme	EC	reg
Revised and Updated Undergraduate Courses in Entrepreneurship and Industrial Management	EC	int
State Ministry of Science	Development of National Research	nat

University of Prishtina

CDP+		int
DAAD		int
Government budget	EC, SIDA, WUS, DAAD	nat
Tempus		int
Tempus, Plant genetic resources, PhD	Government budget	int
USAID		int

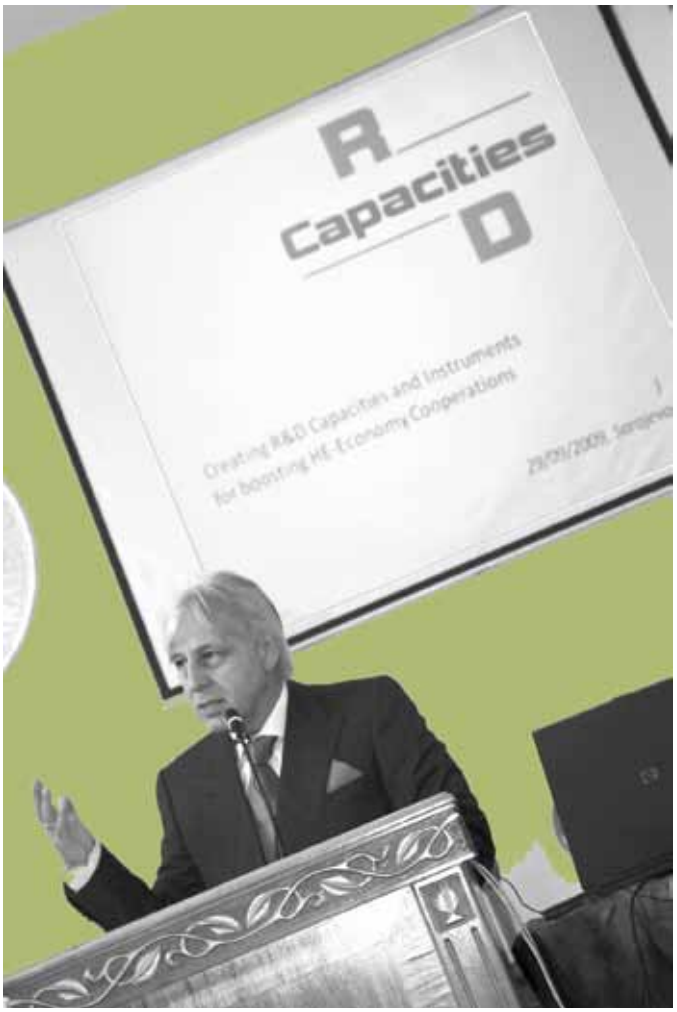
University of Sarajevo

CEEPUS	EC	int
Annual Call for Research Funding	Education Ministry Federation BH	reg
BASILEUS	EC	int
Biannual Call for Research Funding	Education Ministry Canton Sarajevo	reg
DAAD	German Academic Exchange Service	int
FP 6, FP 7	EC	int

Ss. Cyril and Methodius University

Balkan Network	European Commission	reg
Bilateral Cooperation	Ministry of Education and Science	-
Bilateral Programmes (ADA, USAID, GTZ, SINTEF, et...)		int
Copernicus	European Commission	-
FP6		-
FP7	European Commission	int
Framework Programme	European Commission	int
GTZ	German Government	int
IPA		int
National Programme	Ministry of Education and Science	-
SIDA	Swedish Government	int
Tempus	European Commission	int

Table 53: Most important funding source, faculty



7 Human Resources Management

KEY RESULTS
On average, PCUs mostly conduct teaching and not researching activities during their work time
There are few to no scientific staff who teach or research at universities abroad
Few incentives or bonuses for publishing articles or to launch new research projects exist
Most faculties allow professors to be employed outside of the university (sidelines)

7.1 Overall Qualification

Do the following groups dispose of qualified research staff? Please estimate the average level of qualification.				
	Very highly qualified research staff	*Rather highly qualified research staff*	*Rather low qualified research staff*	*Very low qualified research staff*
Other national universities	Sarajevo	-	Skopje	-
Non-university research institutions	Sarajevo	Montenegro, Prishtina	Skopje	-
Business companies	Sarajevo	-	Montenegro	Skopje

Table 54: Average qualification of research staff, university

According to the accounts of all four assessed universities, only non-university research institutions dispose of qualified research staff with rather high qualifications. Nevertheless, Ss. Cyril and Methodius University reported that the qualification of the disposed staff is rather low. Only the University of Sarajevo reports that all the groups listed above dispose of very highly qualified research staff.

7.2 Employment Authority

Does the university management (rectorate, senate, etc.) have the authority to decide on the employment of new professors?

	Yes	No
Universities	3	1

Table 55: Authority of university management on employment of new professors

At the University of Sarajevo, the Research Council decides on the employment of new professors at faculty level. At the Ss. Cyril and Methodius University, the deans (faculty management) make suggestions on the employment of new professors.

Does the university management have the authority to decide on the employment of new scientific assistants (minimum qualification: diploma / master)?

	Yes	No
Universities	3	1

Table 56: Authority of university management on employment of scientific assistants

At the University of Sarajevo, the Research Council decides on the employment of new scientific assistants at faculty level. At the Ss. Cyril and Methodius University, the rector decides on the employment of new scientific assistants based on the faculties' suggestion.

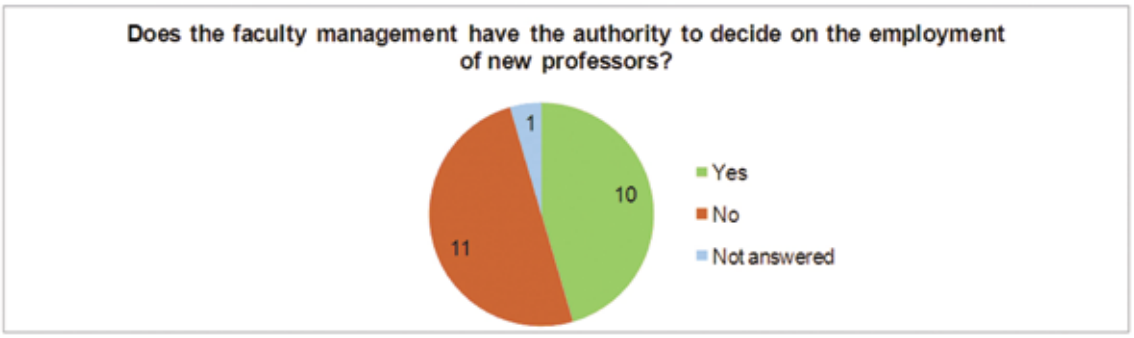


Figure 42: Authority of faculty management on employment of new professors

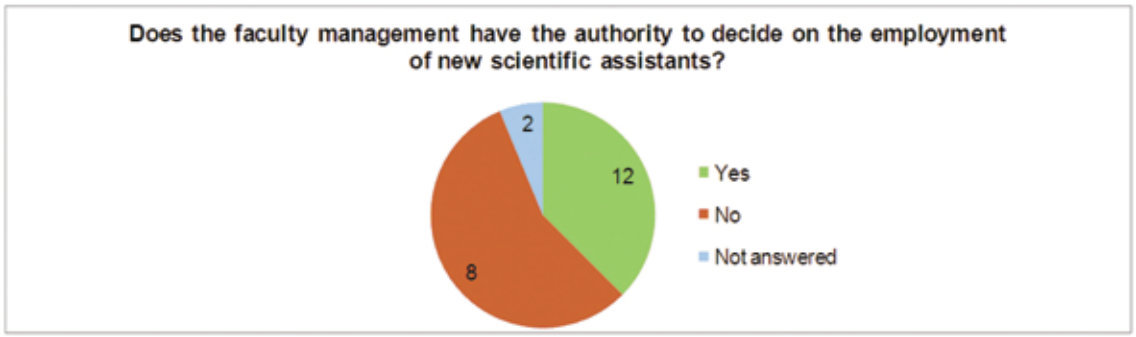


Figure 43: Authority of faculty management on employment of scientific assistants

About half of the faculties under consideration are authorised to decide on the employment of new professors as well as new scientific assistants. The subsequent table indicates details on who is authorised to decide on the employment of new professors and new scientific staff.

Who is authorised to decide on the employment of...		
	...new professors	**...new scientific staff**
University of Montenegro		
Faculty of Economics	Dean of the Faculty of Economics	Dean of the Faculty of Economics
Faculty of Mechanical Engineering	University Board or Directors and Rector's office	
Faculty of Architecture	University Management	Faculty Management

Faculty of Philosophy, Niksic	-	University and Faculty are authorised on the employment of new scientific assistants
Faculty of Maritime Studies	Senate of University	Dean of Faculty if there is the Rector's consent
Faculty of Tourism and Hotel Management	-	-

University of Prishtina

Faculty of Agriculture and Veterinary	University Senate and Rectorate of the University	University Senate and Rectorate of the University
Faculty of Mathematical and Natural Sciences	University Senate and Rectorate of the University	University Senate and Rectorate of the University
Faculty of Electrical and Computer Engineering	University Senate and Rectorate of the University	University Senate and Rectorate of the University
Faculty of Mechanical Engineering	University Senate and Rectorate of the University	University Senate and Rectorate of the University
Faculty of Economics	University Senate and Rectorate of the University	University Senate and Rectorate of the University
Faculty of Philology	University Senate and Rectorate of the University	University Senate and Rectorate of the University

University of Sarajevo

Faculty of Architecture	-	-
Faculty of Philosophy, Sarajevo	Department, Faculty Board of Teachers, University Board, Senate	Department, Faculty Board of Teachers
Faculty of Electrical Engineering Sarajevo	-	-
Faculty of Mechanical Engineering	-	-

Ss. Cyril and Methodius University

Faculty of Electrical Engineering and Information Technology	-	-

Faculty of Veterinary Medicine	-	-
Faculty of Technology and Metallurgy	Teaching Council	Ministry of Education / Government
Faculty of Mechanical Engineering	Teaching Council	-
Faculty of Agriculture	Faculty Board	Faculty Board

Table 57: Authority to decide on employment

7.3 Teaching vs. Research

The following questions aim to measure the relation between teaching and research within the assessed universities.

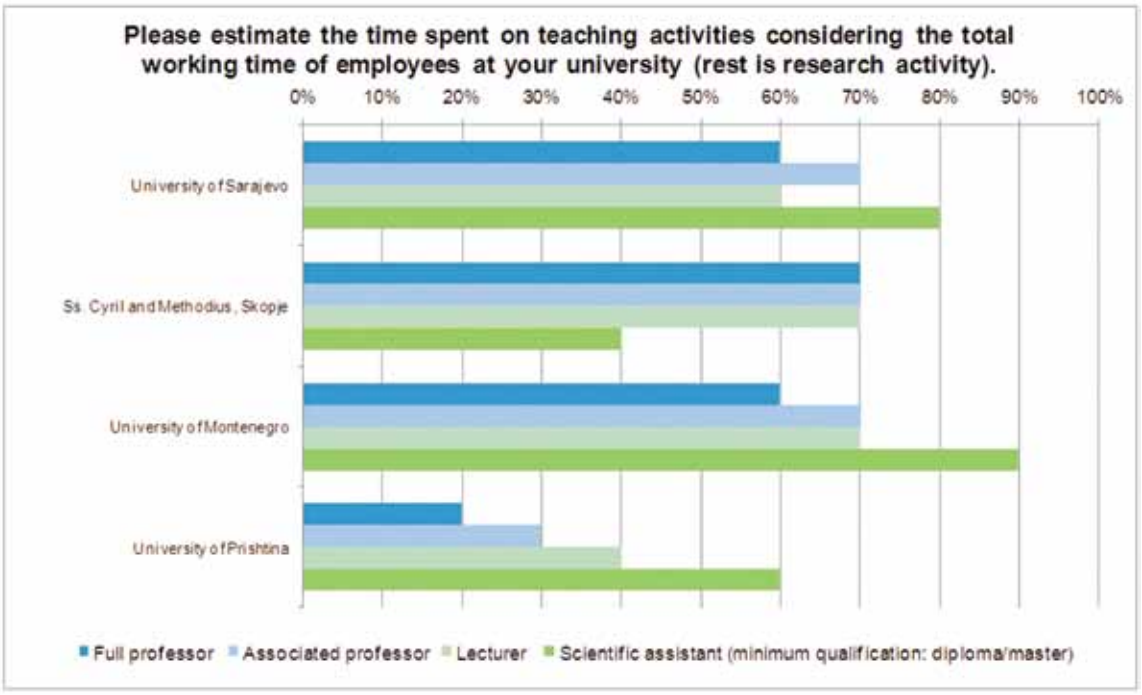


Figure 44: Teaching vs. research activity, university

Three out of four universities reported that they use clearly more time on teaching than on research activities. At the University of Prishtina the proportional distribution of teaching and research activities varies considerably between the different groups of scientific staff.

Please estimate the percentage of total working time of employees at your faculty used for teaching.

	Mean for 17 faculties
Full professor	60%
Associated professor	54%
Lecturer	54%
Scientific assistant	50%

Table 58: Percentage of working time for teaching, faculty

7.4 Personnel Turnover

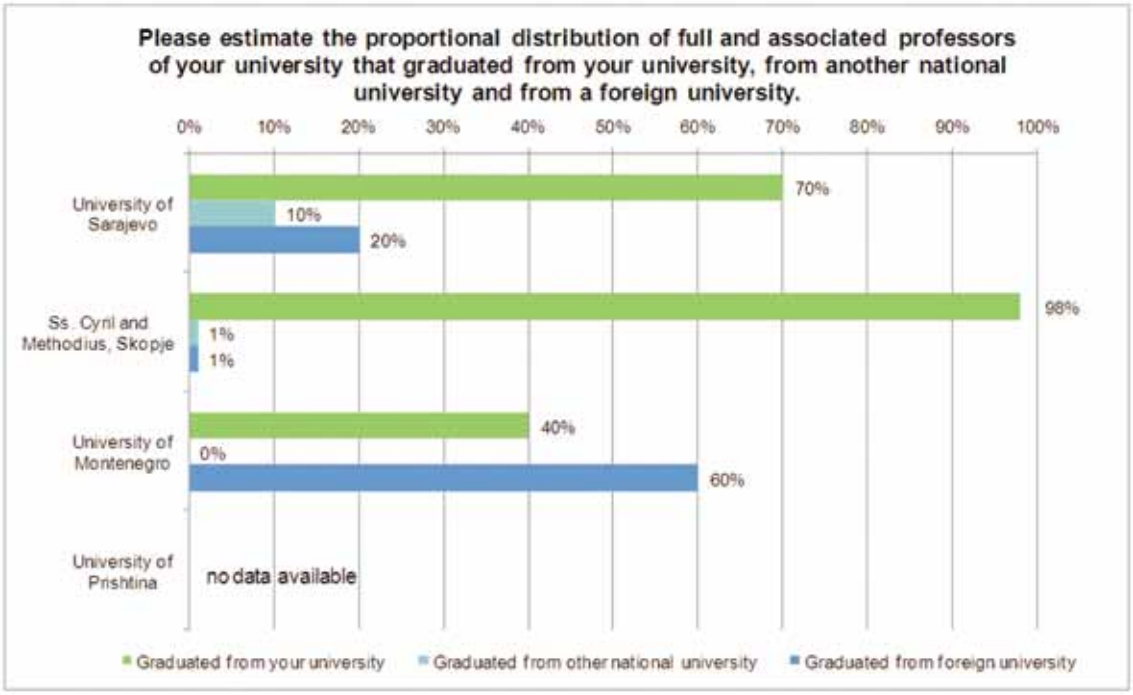


Figure 45: Distribution of professors, university

Please estimate the proportional distribution of full and associated professors of your faculty who graduated from your university, from another national university and from a foreign university.
On average, the majority of professors (60%) are reported as having graduated from the assessed universities. About 11% are reported as having graduated from other national universities. The average regarding full and associate professors reported having graduated from foreign universities is not presented since there are huge differences between the assessed universities (see bar graph above).

Please estimate the number of scientific staff belonging to your faculty and working currently at another national or a foreign university as well as external scientific staff working currently at your

faculty.

According to the data provided at faculty level, the median number of scientific faculty staff working currently at another national or foreign university is 9. There are faculties reporting no outgoing scientific staff at all. The maximum number of outgoing scientific staff is 50. The median number of incoming staff at the faculties is 21.

Please estimate for how many years scientific staff stays at your faculty on average.

Sixteen of the investigated faculties reported that scientific staff stays on average for more than five years at their faculty. Two faculties, the Faculty of Architecture in Sarajevo and the Faculty of Mathematical and Natural Sciences in Prishtina reported that scientific staff stays for approximately 2-5 years.

7.5 Advanced Trainings

Does your university provide continuing education programmes or courses for internal scientific staff additionally to PhD and master related programmes?

Based on the provided data, the Ss. Cyril and Methodius University is the only university which provides continuing education programmes or courses for its scientific staff additionally to PhD and master related programmes.

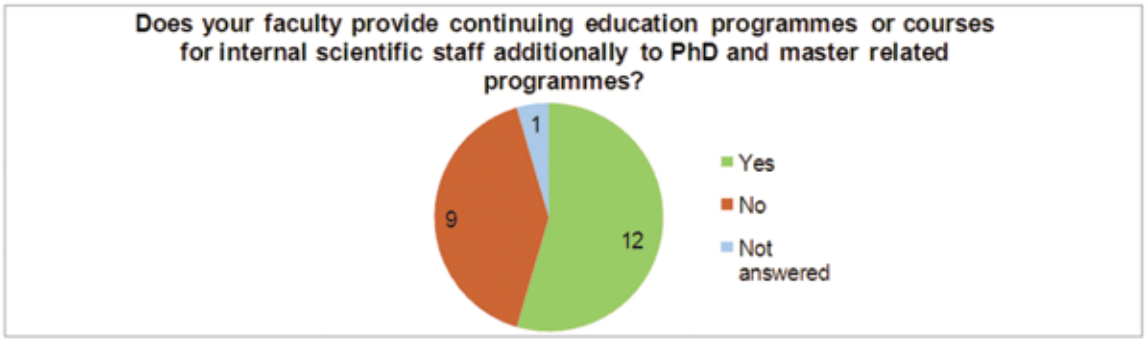


Figure 46: Education programmes at Ss. Cyril Methodius University

7.6 Bonus Systems

Does your university provide monetary bonuses to researchers who publish their research papers in a national or foreign Top-Journal (A-rated)?

	Yes	No
Universities	1	3

Table 59: Monetary bonuses for publishing in top journals, university

Are there non-monetary incentives (e.g. academic promotion) for researchers who initiate research projects?

	Yes	No
Universities	1	3

Table 60: Other bonuses for research initiatives, university

Please specify the most important incentives your university provides.

The University of Montenegro as well as the University of Sarajevo report that they provide public awards for researchers who initiate research projects.

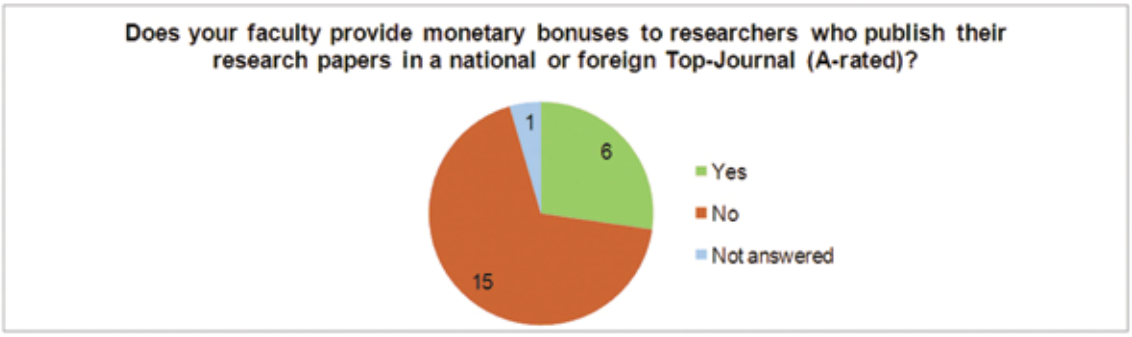


Figure 47: Monetary bonuses for publishing in top journals, faculty

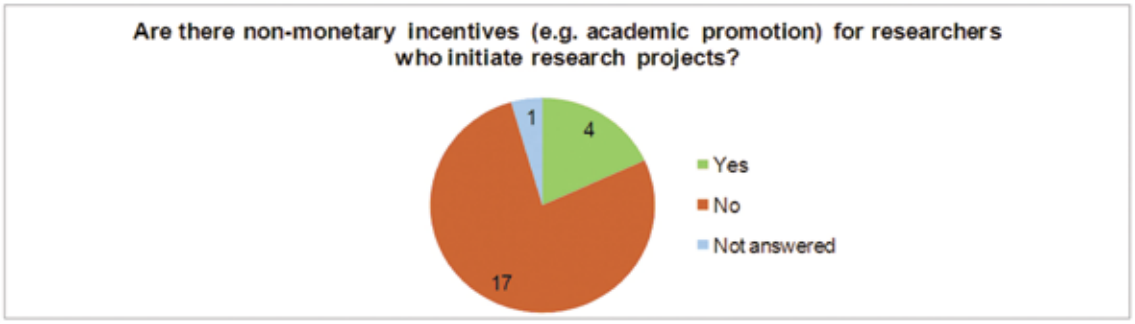


Figure 48: Other bonuses for research initiatives, faculty

The following table lists the non-monetary incentives according to the questionnaire data.

Please specify the most important incentives your faculty provides.
Projects of the Adriatic Region
Best professor-researcher annual award at each faculty, elected by the University Senate
Career development
Financial support
Distance Learning
PhD Study
Printing books
Promotions
Secures all necessary materials for special cases
Specialisation

Table 61: Most important incentive for research, faculty

7.7 Sidelines

Are professors allowed to have sidelines (secondary employment) next to their university employment?

At each of the assessed universities professors are allowed to have sidelines next to their university employment.

Which working intensity (in working hours) per week is allowed for sidelines (secondary employment) at your university?

At two universities there is no limitation for working hours within sidelines; at one university the limit is 6 hours, at another one it is 8 hours.Three universities estimate the intensity of sidelines that professors use is rather low while one university states it is rather high.

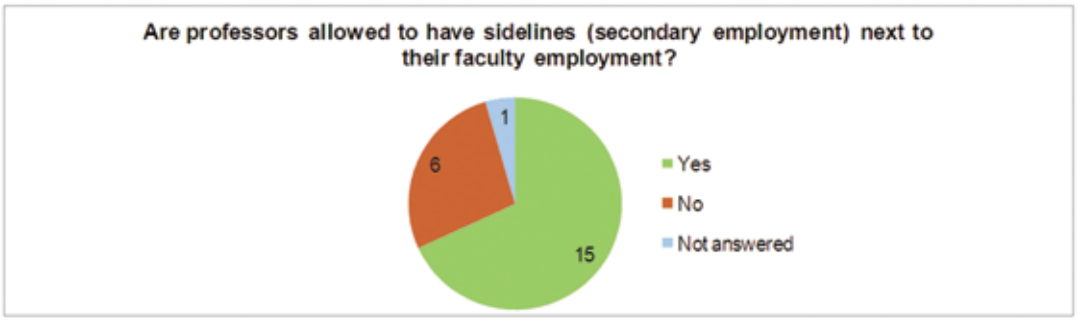


Figure 49: Sidelines for professors, faculty

Six out of 21 faculties state that sidelines are not allowed. This result does not correspond to data at university level.

Which working intensity (in working hours) per week is allowed for sidelines (secondary employment) at your faculty?

On average, the working intensity allowed for sidelines is restricted to 11 hours per week. The minimum intensity allowed for sidelines is reportedly 2 hours per week whereas the maximum is 21 hours per week.

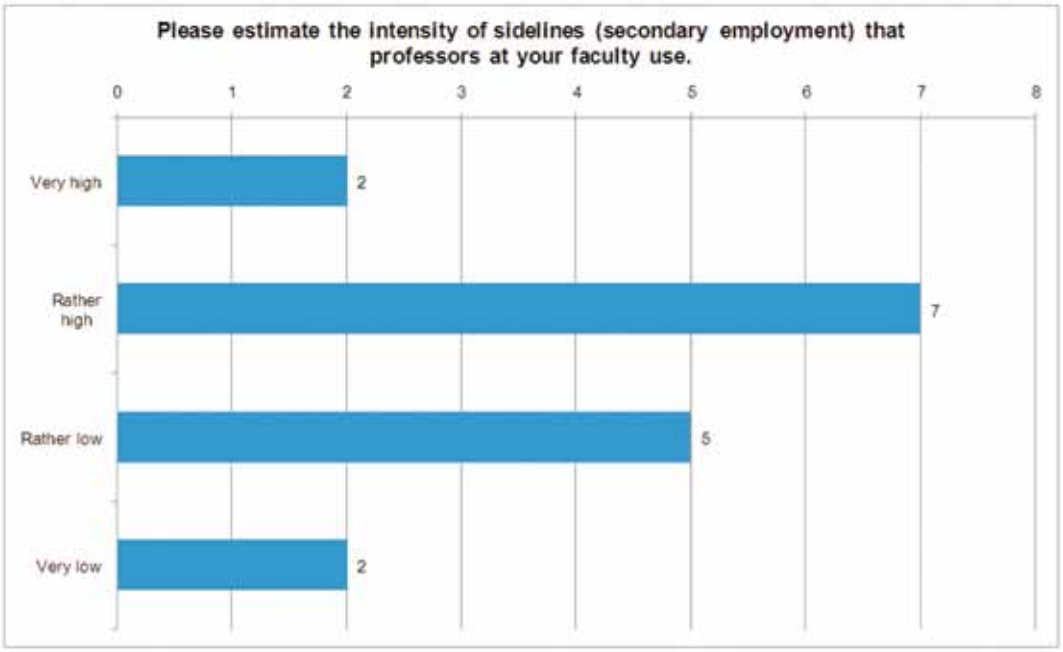


Figure 50: Intensity of sidelines for professors, faculty

8 Teaching Organisation

KEY RESULTS
The majority of PhD and master theses deal with applied research and not with basic research
Nevertheless only 10% of these empirical works are done within a cooperation with a business company
Little more than half of the PhD students are employed as scientific assistants at their university
A vast majority of PhD students work at the university after their graduation

8.1 Orientation of Theses

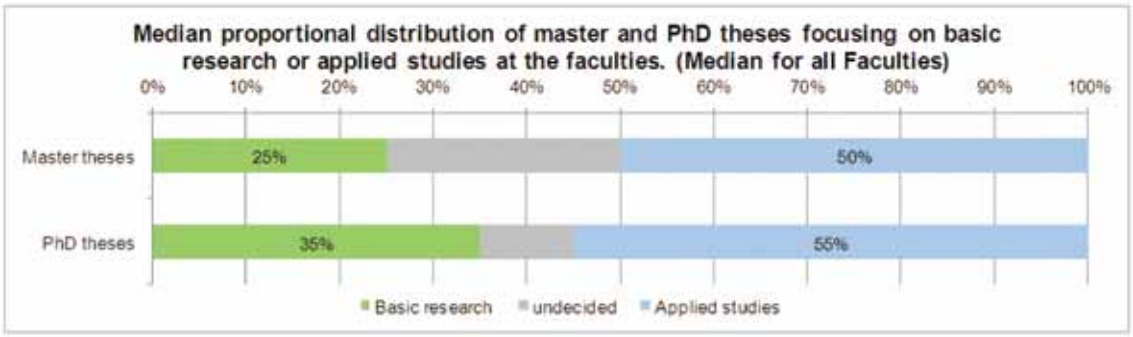


Figure 51: Distribution of master and PhD theses on basic research or applied studies, faculty

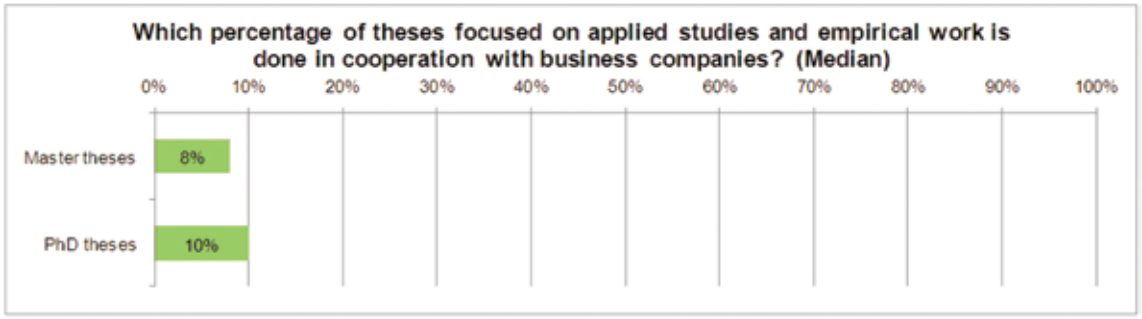


Figure 52: PhD and master theses applied studies in cooperation with business, faculty

According to the data, up to 8% of master and up to 10% of PhD theses are done in cooperation with business companies.

8.2 PhD Studies

Please estimate the average duration of PhD studies at your university.	
University of Montenegro	4 years
University of Prishtina	4 years
University of Sarajevo	4 years
Ss. Cyril and Methodius University	5 years

Table 62: Duration of PhD studies, university

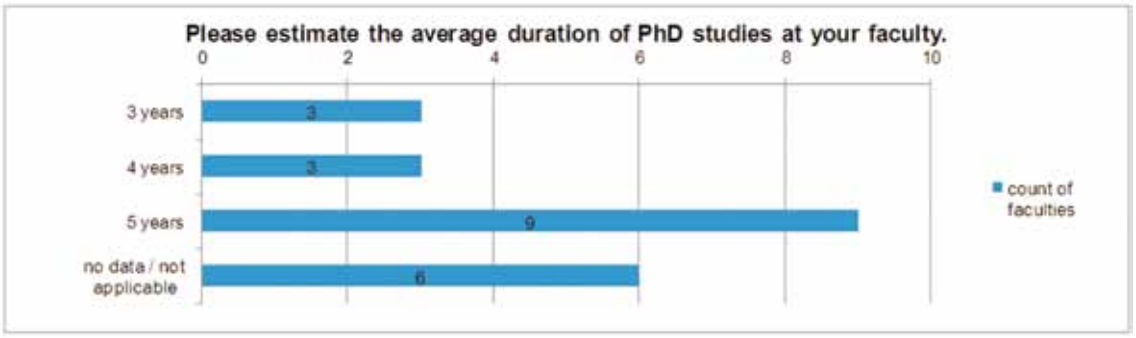


Figure 53: Duration of PhD studies, faculty

According to the questionnaire, at all four universities the majority (>75%) of PhD students is employed in a salaried position as scientific assistants.

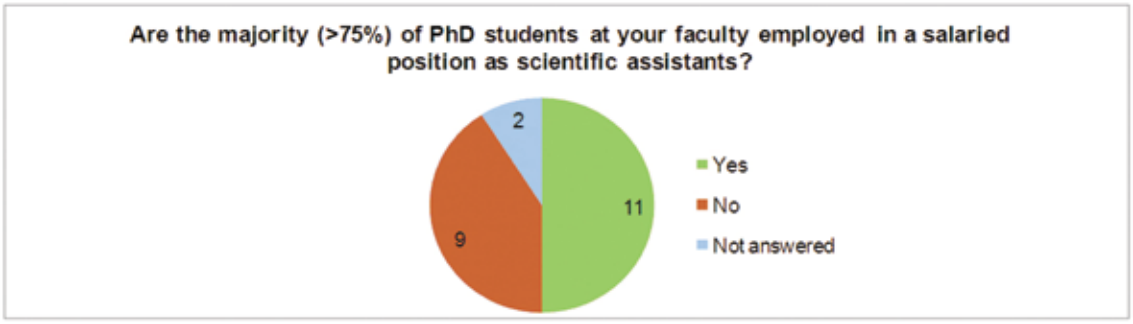


Figure 54: Employment of PhD students as scientific assistants, faculty

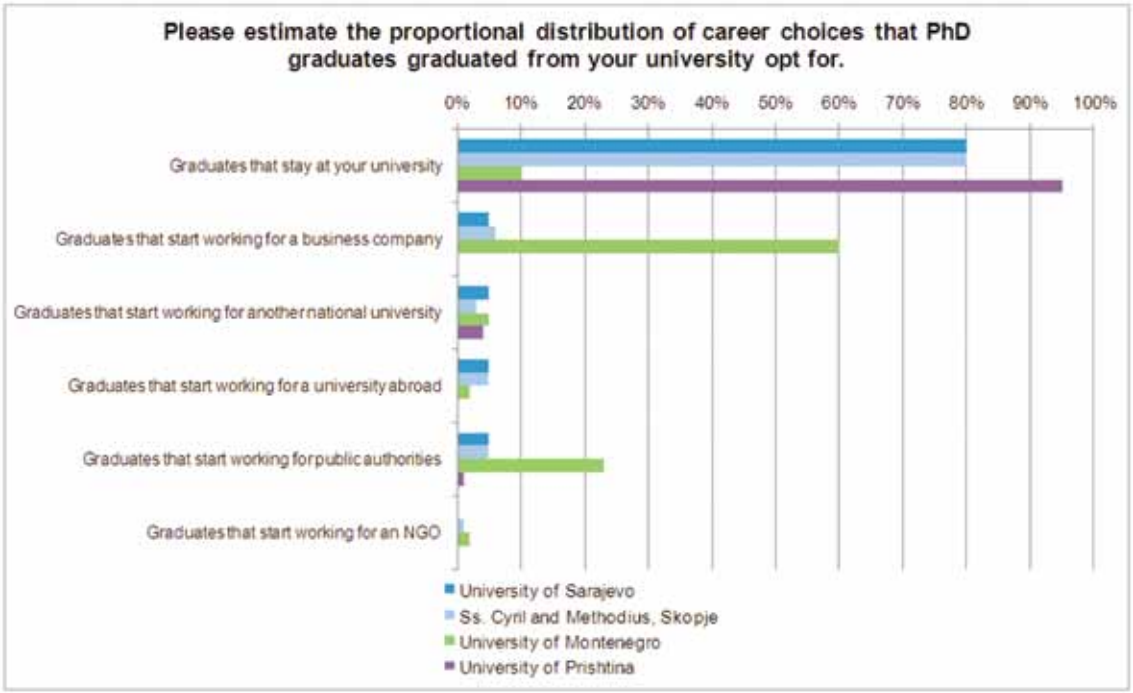


Figure 55: Career choices of PhD graduates, university

The University of Montenegro reportedly has the most graduates who do not stay at the university where they finished their PhD studies.

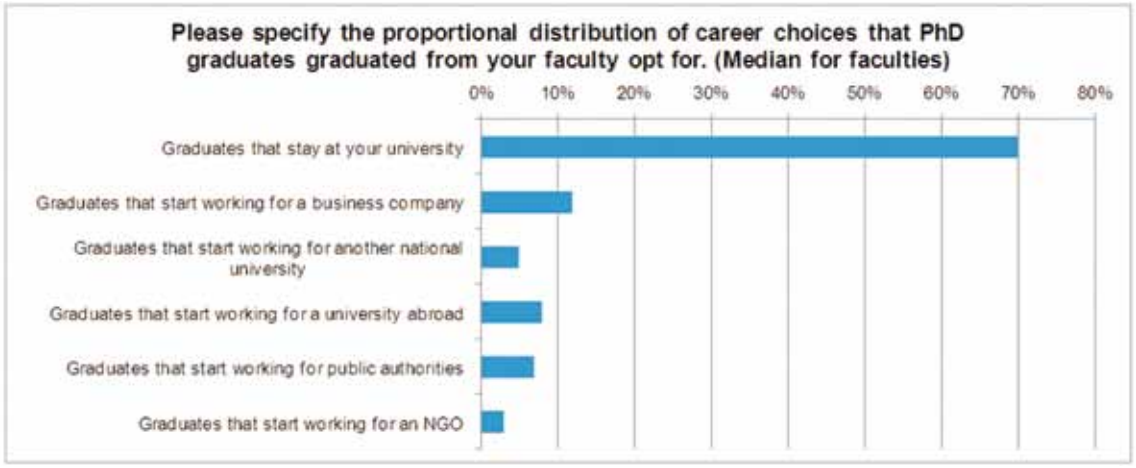


Figure 56: Career choices of PhD graduates, faculty

According to the data, a vast majority of PhD graduates stay at their university.

9 Research Organisation

KEY RESULTS
There is little to no documentation about the workflow in typical projects implemented at PCUs
PCUs make very little use of IPRs (intellectual property rights), both at university as well as at faculty level
Authorisation of IPR applications (e.g. patent applications) are made by the management level, not by the researcher

9.1 Project Workflow

Please describe the workflow of a typical research project at your university.
Please specify persons/organisational units that contribute to and/or are responsible for the following steps within a research project.

Please describe the workflow of a typical research project at your university. Please specify persons/organisational units that contribute to and/or are responsible for the following steps within a research project.		
Project step	*Persons/organisational units that contribute*	*Persons/organisational units that make official decisions*
University of Sarajevo		
Initiation of the project	University/rectorate	Rectorate/senate
Approval of the project	University/rectorate	Vice rector
Allocation of project funding	University/rectorate	Vice rector
Implementation of the project	Vice rector	University/rectorate
Review of project success	Senate	
University of Montenegro		
Initiation of the project	Researcher(s)	University/rectorate
Approval of the project	Institute/department	Institute/department
Allocation of project funding	Faculty/dean or vice dean	-
Implementation of the project	-	Faculty/dean or vice dean
Review of project success	Faculty/dean or vice dean	-

Table 63: Workflow of research project, university

Is there an existing written document defining the workflow process of relevant research projects that is available to all key members of the university?

There was no affirmative answer: three universities answered in the negative.

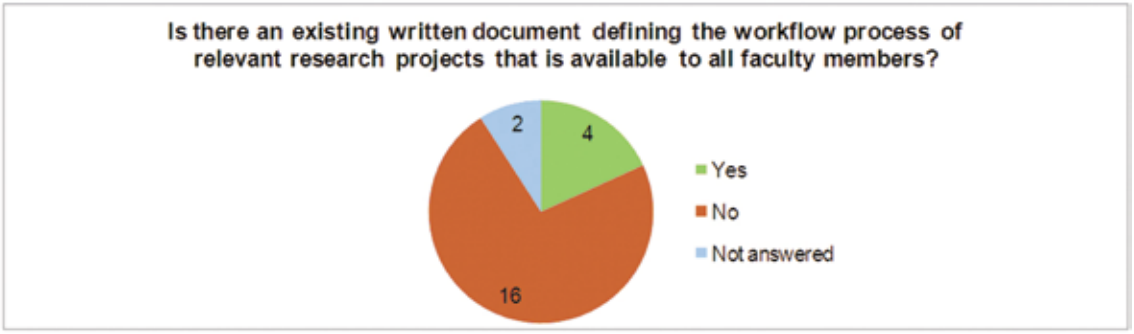


Figure 57: Documents defining workflow, faculty

Four faculties reported using a written document defining the workflow process of relevant research projects whereas a majority of 16 answers were in the negative. One faculty (Montenegro Maritime Studies) attached the document defining the workflow process of relevant research projects to the questionnaire.

9.2 Intellectual Property

Who is authorised to register a patent for inventions and research achievements that result from research activities at your university?	
University of Montenegro	University
University of Prishtina	No data
University of Sarajevo	Institute for Intellectual Property
Ss. Cyril and Methodius University	Researcher / research group

Table 64: Authorisation to register a patent, university

Does your university usually protect intellectual property rights (IPR) of its inventions and research achievements (patents)?

	Yes	No
Universities	1	3

Table 65: Use of IPR, university

Please specify the possibilities your university applies in dealing with the use of university-owned intellectual property rights (IPR).

None of the assessed universities reportedly engages in patent assignment, licensing or the foundation of companies for patent realisation.

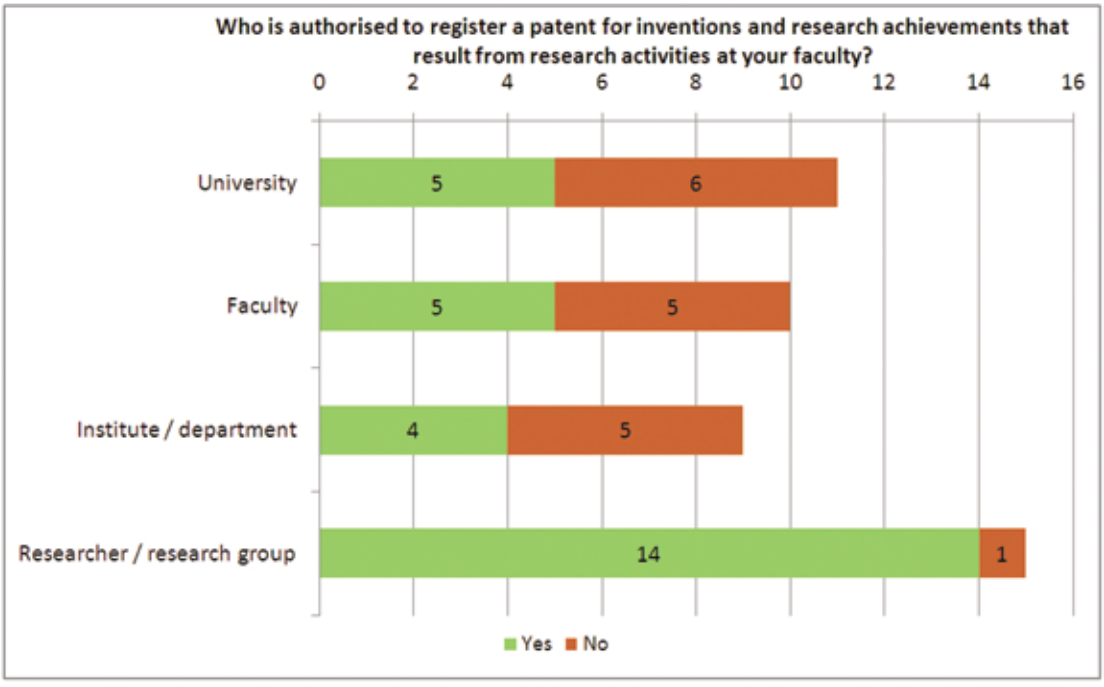


Figure 58: Authorisation to register a patent, faculty

At faculty level researchers are most often authorised to register a patent for inventions and research achievements.

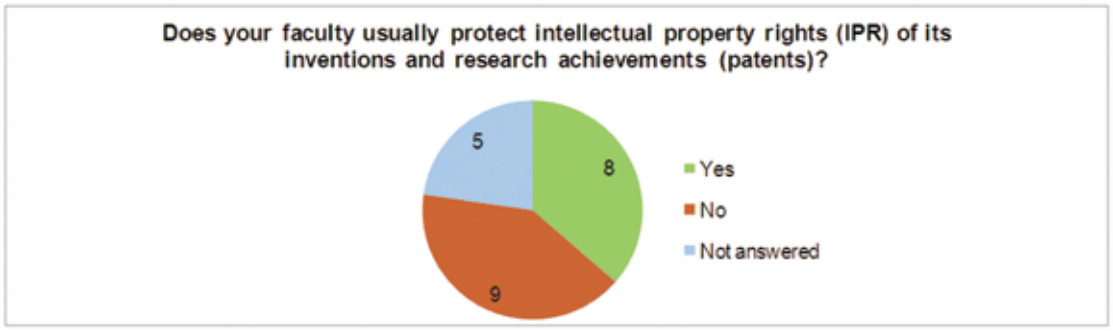


Figure 59: Use of IPR, faculty

About half of the faculties usually protect intellectual property rights.

10 Research Implementation

KEY RESULTS
There is generally low support for entrepreneurial activities at PCUs
Focus of cooperations of PCUs lie on other universities rather than on economy or business
Consequently, very few spin-off companies have been created out of research projects at the PCUs
Mostly research performance of faculties is not systematically evaluated
Faculties reported that they published on average a maximum of 5 articles in peer-reviewed publications in 2008

10.1 Research Topics

What are the main sectors that perform research in your country?
Please select the 5 most important topics.

University of Montenegro	
Agricultural Sciences	Agricultural Biotechnology
Natural Sciences	Computer and Information Sciences
Engineering and Technology	Environmental Engineering
Medical and Health Sciences	Clinical Medicine
Humanities	Arts

University of Prishtina	
Natural Sciences	Mathematics, Computer & Information Sciences, Physics Sciences, Chemical Sciences/Chemistry, Biological Sciences
Engineering and Technology	Electrical Engineering/Electronic Engineering/Information Engineering, Mechanical Engineering, Materials Engineering,
Medical and Health Sciences	Basic Medicine, Clinical Medicine, Health Sciences, Dental Medicine
Agricultural Sciences	Field Crops; Animal Management and Dairy Science Plant Protection Veterinary Science Agro-economics
Social Sciences	Psychology, Economics & Business, Educational Sciences, Sociology, Law
Humanities	History & Archaeology, Languages & Literature, Philosophy, Arts

University of Sarajevo	No data is available

Ss. Cyril and Methodius University	
Natural Sciences	Chemistry
Engineering and Technology	Electrical/Electronic Engineering/Information Eng.

Medicine and Health Sciences	Clinical Medicine
Agricultural Sciences	Agriculture/Forestry/Fishery
Social Sciences	Economics, Business
Humanities	History, Archaeology

Table 66: Sectors that perform research at national level

What are the main economic/industrial problem fields in your country that need large cooperational research projects to be solved and where you can imagine that your university could contribute?	
University of Montenegro	Problems of waste, waste water, water management, civil engineering and construction, forestry
University of Prishtina	The Agriculture Faculty will contribute to agriculture industry and food safety; The Faculty of Medicine will contribute to overall human health; The Faculty of Machinery and Engineering will contribute to mechanical industry, electrical engineering; The Faculty of Mathematical and Natural Sciences will contribute to environment related issues, etc.
University of Sarajevo	Environmental protection, air pollution, social care
Ss. Cyril and Methodius University	Medicine, archaeology, agriculture, ICT, economy

Table 67: Main fields for research cooperation projects

Have there ever been activities to evaluate the research situation (e.g. evaluation studies) in your country at state level?	
University of Montenegro	Yes: FP7 REGPOT-2-2008 project EVOLUNIMONT (evaluation of research capacities of the University of Montenegro in progress)
University of Prishtina	No, not so far.
University of Sarajevo	-
Ss. Cyril and Methodius University	Yes, activities to evaluate national research activities No activities to evaluate regional research activities For UKIM: http://www.ukim.edu.mk/en_content.php?meni=88&glavno=83

Table 68: Level of evaluation of research situation

Who is responsible for public evaluation of research in your country?

University of Montenegro	Ministry of Education and Science through its bodies like the Council for Higher Education and Council for Scientific Research Activities
University of Prishtina	Not yet specified
University of Sarajevo	-
Ss. Cyril and Methodius University	Ministry for Education and Science

Table 69: Responsibility for research evaluation

The following list depicts the main research topics of the four universities under assessment:

Please specify the main research topics at your university (max. 5). Select from the list below.

University of Montenegro

Earth & related environmental sciences
Medical and health sciences
Environmental engineering
Electrical engineering/Electronic engineering/Information engineering
Agricultural sciences

University of Prishtina

Agriculture/Forestry/Fishery	Field crop production, animal production
Basic medicine	Zoonosis infections, infection prevalences
Other humanities	Democratic developments and activities in the country and the region
Electrical engineering/Electronic engineering/Information engineering	Assessment of child exposure to radio electromagnetic frequency
Chemical sciences/Chemistry	-

University of Sarajevo

Electrical engineering/Electronic engineering/Information engineering	Numerical simulation
Medical and health sciences	Microbiology
Biological sciences	Genetic engineering
Physical sciences/Physics	Ecology/Environmental lasers
Veterinary science	Food quality

Ss. Cyril and Methodius University

no data

Table 70: Main research topics, university

10.2 Research Infrastructure

Does your university have research infrastructure (such as laboratories, computer centres, libraries ...)?

Reportedly all four universities have research infrastructure such as laboratories, computer centres, libraries and so on.

Please specify the main research infrastructure of your university in the following table.

University of Montenegro

ICT Chemical testing Materials testing Food quality testing Environmental testing

University of Prishtina

Faculty laboratories Computer laboratories

University of Sarajevo

Laboratories Computer centre Libraries Food quality testing

Ss. Cyril and Methodius University

Laboratories Libraries Computer classroom

Table 71: Research infrastructure, university

10.3 Publications

Please specify the number of publications at your university in 2008		
University	*Number of publications*	*Data origin*
University of Sarajevo	550	educated guess
University of Prishtina	500	educated guess
Ss. Cyril and Methodius University	no data	no data
University of Montenegro	no data	educated guess

Table 72: Number of peer-reviewed publications 2008, university

Please specify the number of publications at your faculty in 2008 and estimate the proportion of peer-reviewed publications.

The faculties report publishing < 5 publications per year. Most faculties specified a number of 2 or 3 publications per year.

Please specify the source and title of the main publications in 2008 (max. 5 publications).	
Title of publication	*Source of publication*
Combining ability studies for leaf area in some maize inbreed lines in Agro ecological conditions	Acta Agriculturae Slovenica. Vol. 91, number 1:67-73 pp
A Note on the Congruence (formula)	American Mathematical Monthly (ISSN:0002-9890), Volume 116, Issue 1,
Entropy generation minimisation of a double-pipe pin fin heat exchanger	Applied Thermal Engineering
The effect of technical parameters of the road in the stability of vehicle motion	Conference Stamboll
A. Salihbegovic, et al. “Web based multilayered distributed SCADA/HMI system in Refinery application”	Elsevier Journal – Computer standards and Interfaces No. 31, pages 599–612
Building and Structure Elements	Faculty textbook
Recounting Cultural Encounters	Filozofski fakultet Niksic

Crnogorska crkva 1852-1918.	Filozofski fakultet Niksic
Filoloska sveska	Filozofski fakultet Niksic
Riječ	Filozofski fakultet Niksic
Sociološka luča	Filozofski fakultet Niksic
Characteristics of production potential for yield and biomass of new winter wheat (Triticum aestivum)	General EUCARPIA Congress, 9-14 September, 2008. 234-239 pp
	IEEE Journals, Transactions, Letters, Magazines, ...
Time-frequency-based non-stationary interference suppression for noise radar systems	IET Radar, Sonar & Navigation (ISSN:1751-8784), Volume 2, Issue 4
A.Salihbegovic, S.Ribić "Development of online Internet laboratory"	Innovative techniques in instruction technology, E-learning, E-assessment and Education, Springer
Current state of motor fuels quality in Montenegro Institute	Institute for transportation, Podgorica
Velagić, J., Osmić, N. and Lačević, B. "Neural Network Controller for Mobile Robot Motion Control"	International Journal of Intelligent Systems and Technologies, pp. 127-132, Vol. 3, No. 3, (2008)
International workshop Gornja Lastva	International student workshop
International workshop Donji Murici	International student workshop
Genetic diversity and structure of the West Balkan Pramenka sheep types as revealed by micro satellite	J Anim Breed Genet. 2008 Dec;125(6):417-26
Analysis of Consumer Behaviour in regard to Dairy Products in Kosovo	J. Agric. Res., 2008, 46(3)
Environmental Sensitivity of Milk Production in Extensive Environments: A comparison of Simmental, B	J. Dairy. Sci, 90: 3883-3888
Dynamic Equipment Deployment at a Container Terminal: Transfer System Based on Real-Time Positioning	Journal of Mechanical Engineering (ISSN:0039-2480), Volume 55, Issue 2,
	Online papers (online journals)

Analysis of the ballast water level	Scientific Report, Dubrovnik IPA
Kostanjica	Site research
S. Mrdovic, B. Perunicic "NIDS Based on Payload Word Frequencies and Anomaly of Transitions"	Third IEEE International Conference on Digital Information Management ICDIM 2008

Table 73: Source and title of main publications 2008, university

How has the annual number of publications at your university evolved within the last five years?
The annual number of publications increased for all universities on which data is available within the last five years.
How has the annual number of publications at your faculty evolved within the last five years?
13 faculties report that the number of publications has increased. Three faculties state that the number of publications remained constant.

10.4 Events

Has your university organised national or international events (conferences, workshops, etc.) on specific research topics in 2008?
All investigated universities report having organised national or international events (conferences, workshops, etc.) on specific research topics in 2008.

How many events (conferences, workshops, etc.) on specific research topics have been organised by your university in 2008? Please specify the target audience of the events (conferences, workshops, etc.) your university has organised in 2008.		
	Count of events	Target audience
University of Montenegro	3	Scientific university staff, Researchers
University of Prishtina	2	Scientific university staff, Researchers, Students, Economy
University of Sarajevo	30	Scientific university staff, Researchers
Ss. Cyril and Methodius University	50	Scientific university staff, Researchers

Table 74: Events on research topics 2008, university

Figure 60: Events on research topics 2008, faculty

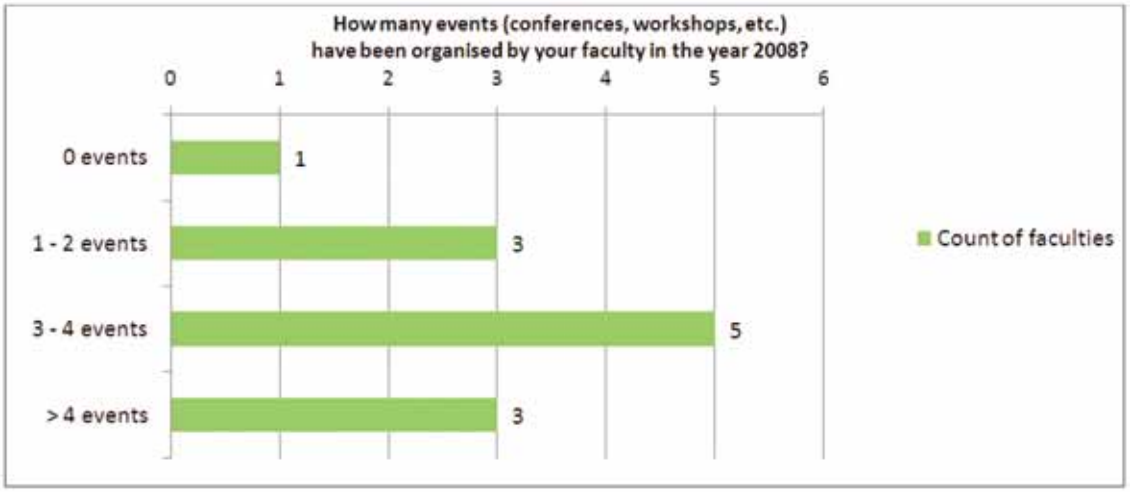


Figure 61: Conferences on research topics 2008, faculty

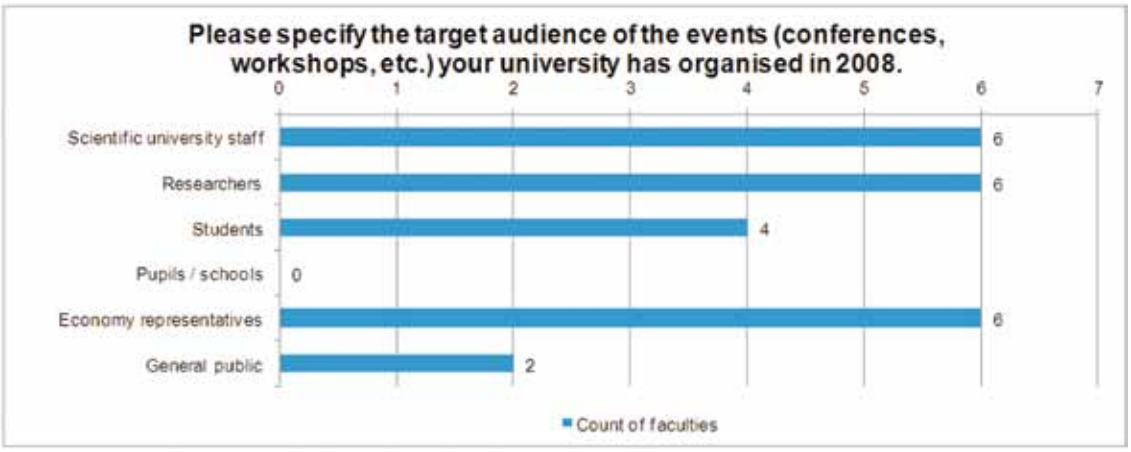


Figure 62: Target audience of events 2008, university

10.5 Entrepreneurial Activities

Are researchers at your university allowed by law to found their own company or to hold shares of a company?				
	University of Sarajevo	*Ss. Cyril and Methodius Uni.*	*University of Montenegro*	*University of Prishtina*
University as a whole allowed to found a company	yes	no	yes	yes
University as a whole allowed to hold company shares	yes	no	yes	yes
Researcher / research group allowed to found a company	no	yes	yes	yes
Researcher / research group allowed to hold company shares	no	yes	yes	yes

Table 75: Legally granted companies owned by researches, university

Figure 63: Legally granted companies owned by researches, faculty

Have research activities at your university ever been followed by the foundation of spin-off companies?	
University of Sarajevo	no
University of Prishtina	yes
Ss. Cyril and Methodius	yes
University of Montenegro	no

Table 76: Research activities lead to spin-off companies, university

The Ss. Cyril and Methodius University provides an estimate according to which approximately 20 spin-off companies were founded, all of which were initiated by students. The University of Prishtina provides no further details on this topic.

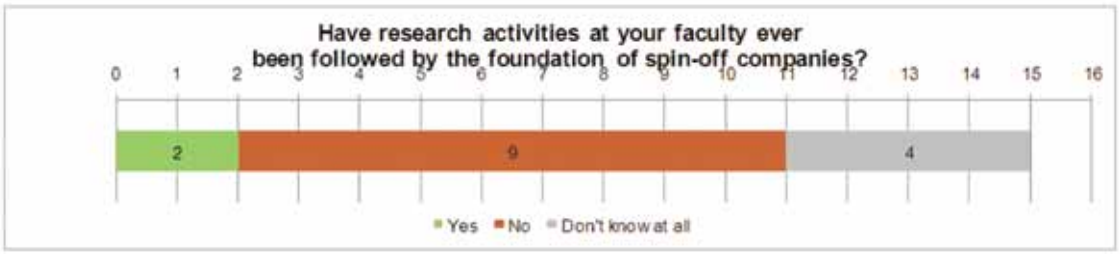


Figure 64: Research activities lead to spin-off companies, faculty

More than half of the faculties under consideration report that research activities have never been followed by the foundation of spin-off companies.

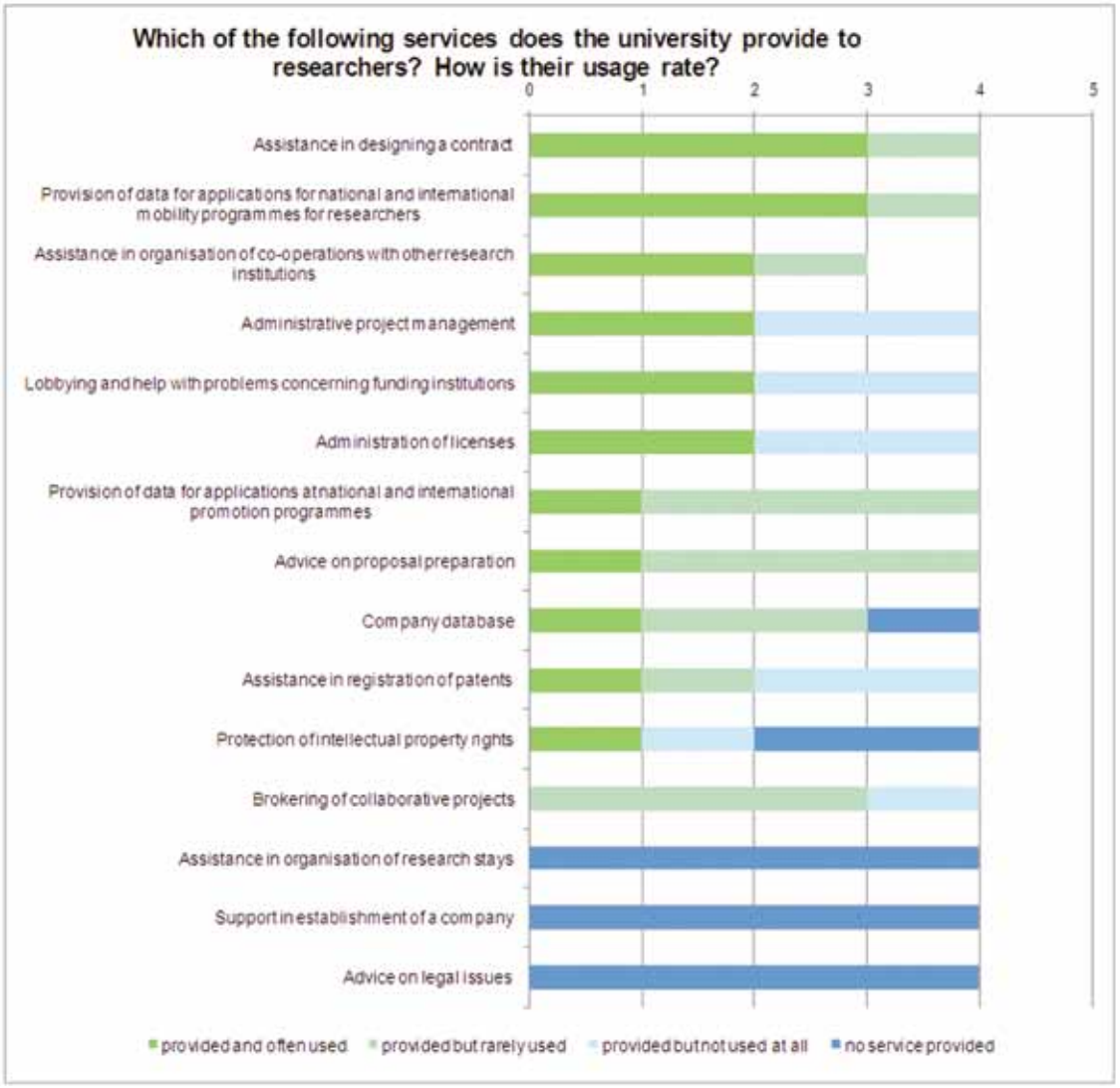


Figure 65: Services provided by university for its researchers

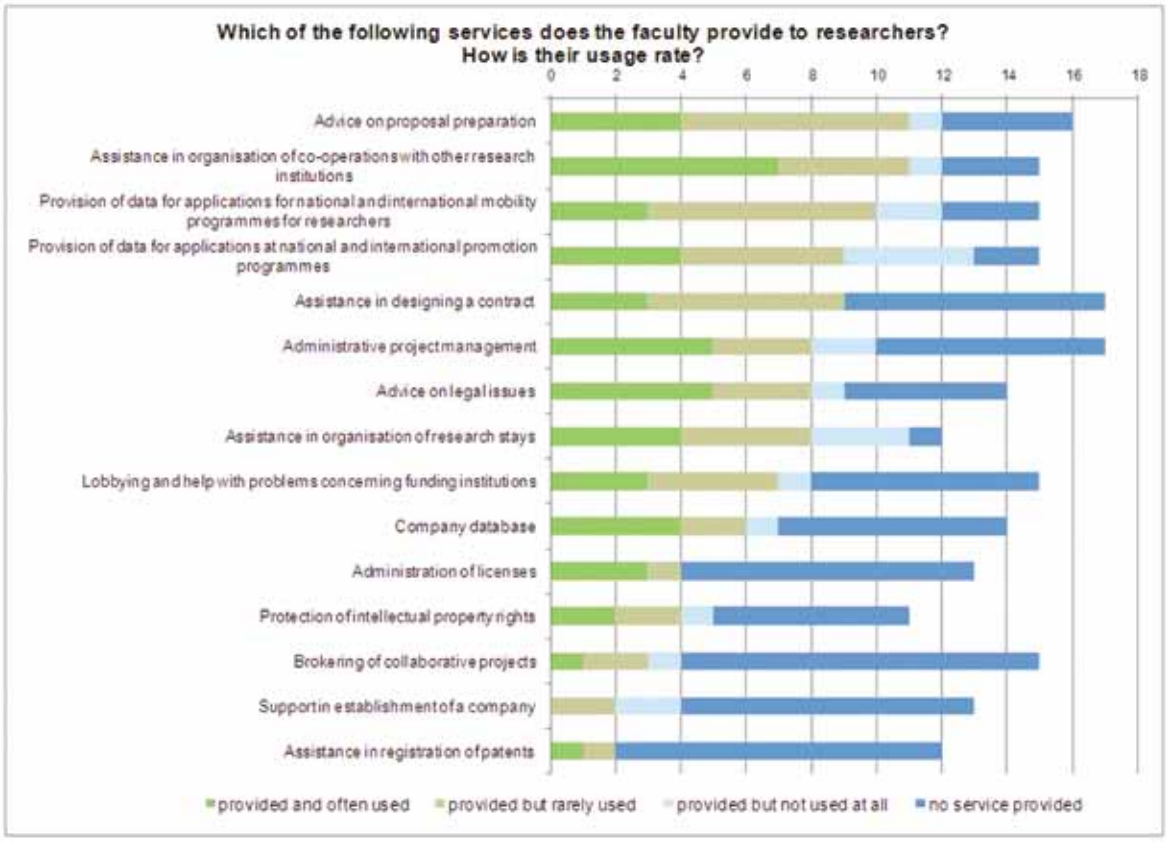


Figure 66: Services provided by faculty for its researchers

Does your university provide institutional support for the development of entrepreneurial activities?	
Outsourced research centres (research centres, technology parks)	Provided by University of Sarajevo, Ss. Cyril and Methodius University
Incubators	Not provided by any university

Table 77: Support for entrepreneurial activities, university

The University of Sarajevo and the Ss. Cyril and Methodius University both reported providing institutional support for the development of outsourced research centres or technology parks. The University of Montenegro answered in the negative. There is no data provided on this item by the University of Prishtina. None of the assessed universities provide incubators.

Figure 67: Support for entrepreneurial activities, faculty

10.6 Cooperative Research

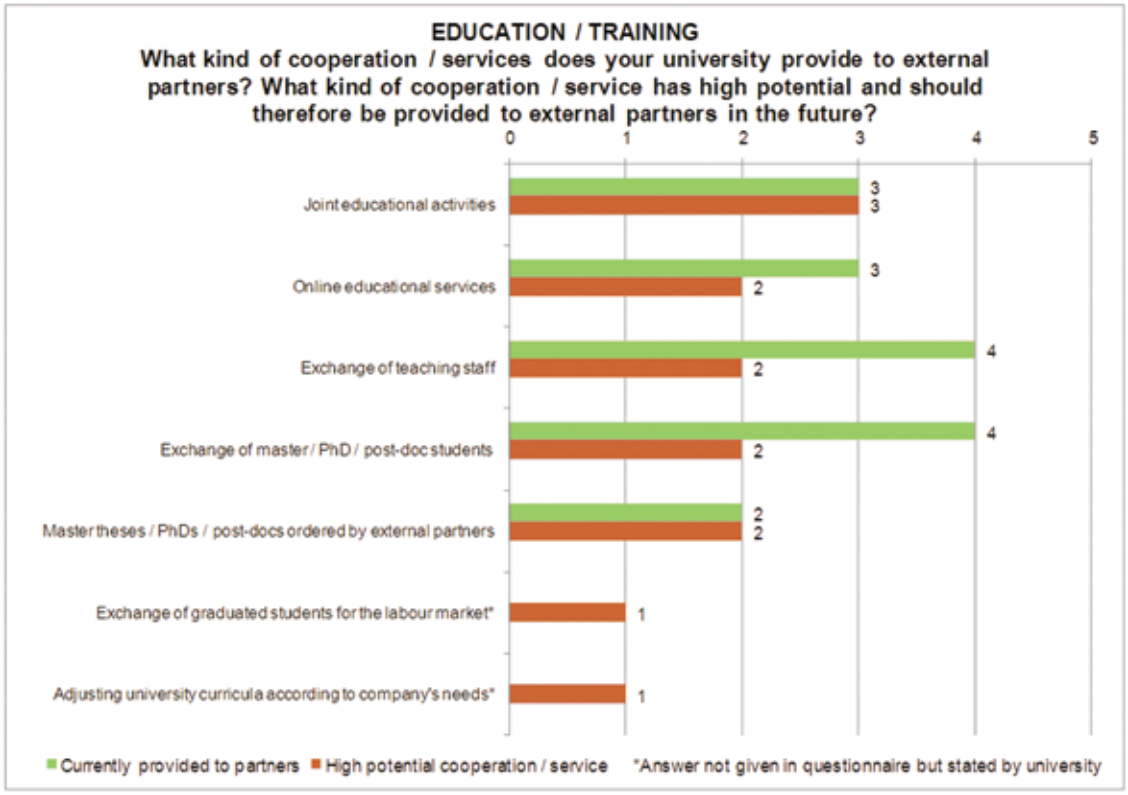


Figure 68: Education and training for external partners, university

Joint educational activities are the kind of cooperative activity which university respondents most frequently perceive as having high potential; three out of the four assessed universities engage in joint educational activities. The greatest discrepancy between actually provided cooperation/service and prospective high potential cooperation/service is reported for the exchange of teaching staff and master/ PhD/ post-doc students.

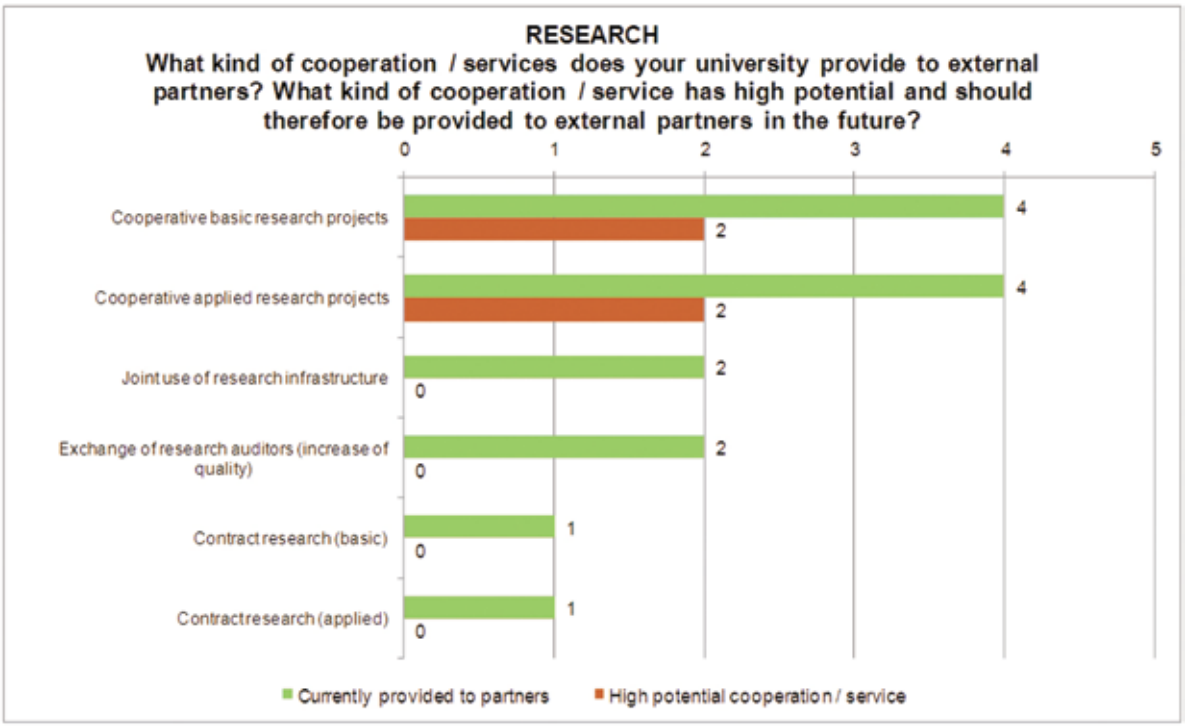


Figure 69: Research services to external partners, university

All universities report to provide basic and applied research projects.

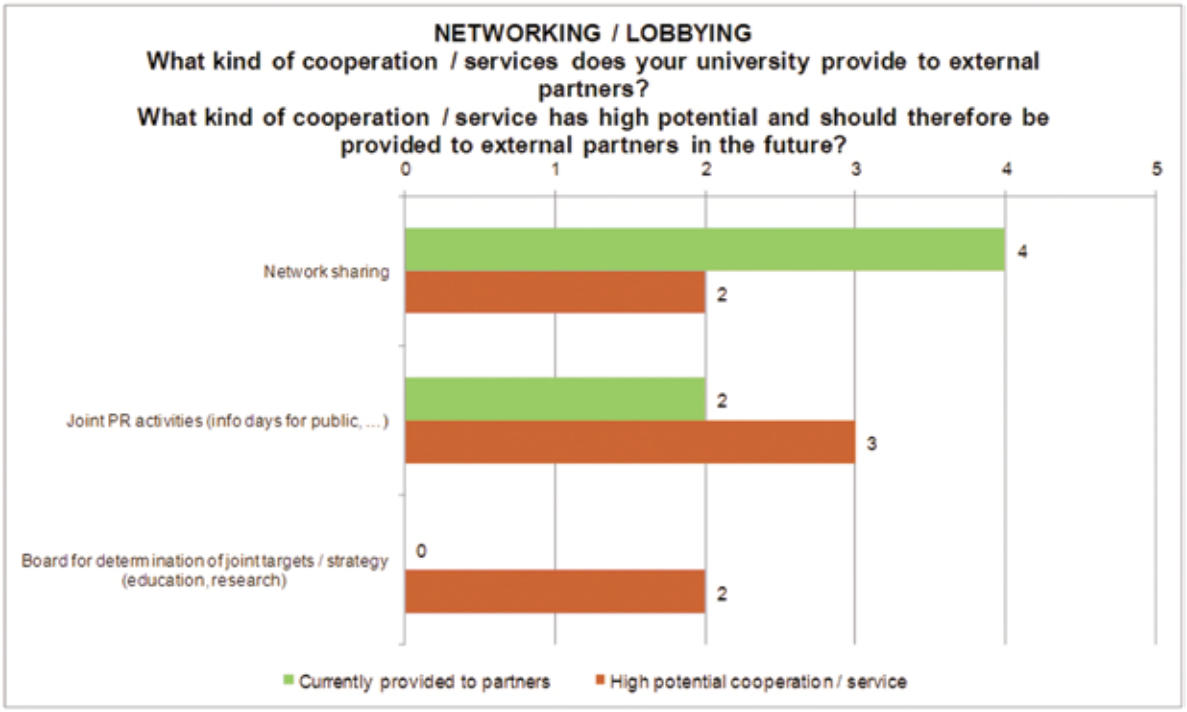


Figure 70: Networking and lobbying, university

The sharing of networks as well as joint PR activities is provided by (almost) all universities; these activities are expected to have high potential as well. A board for the determination of joint targets/strategies is rated as having high potential by half of the universities but no university currently provides this cooperation tool.

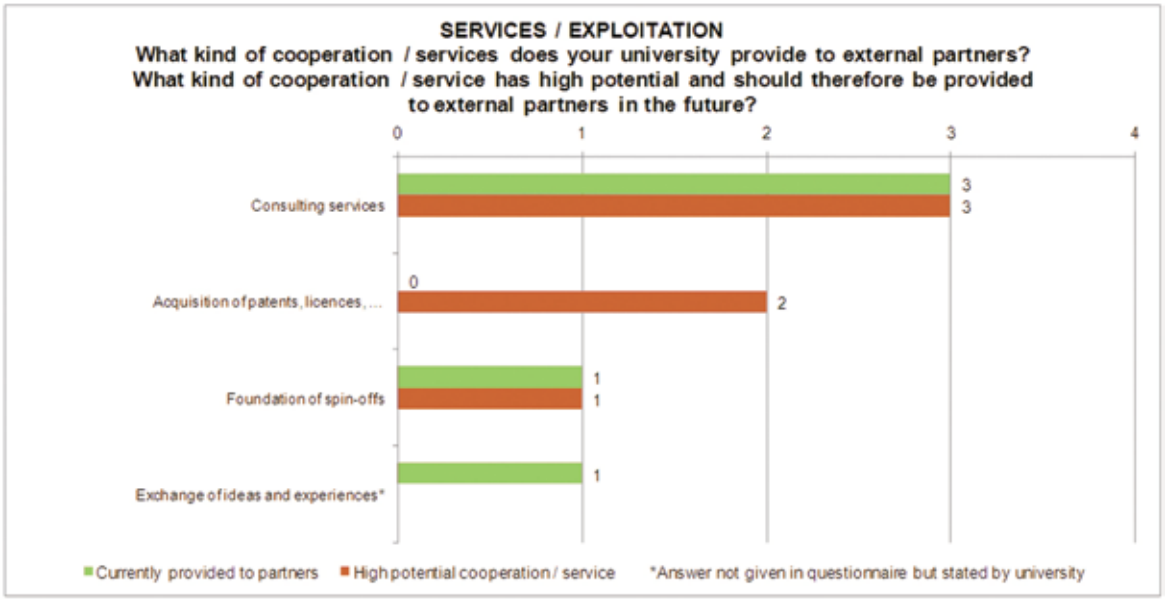


Figure 71: Services and exploitation, university

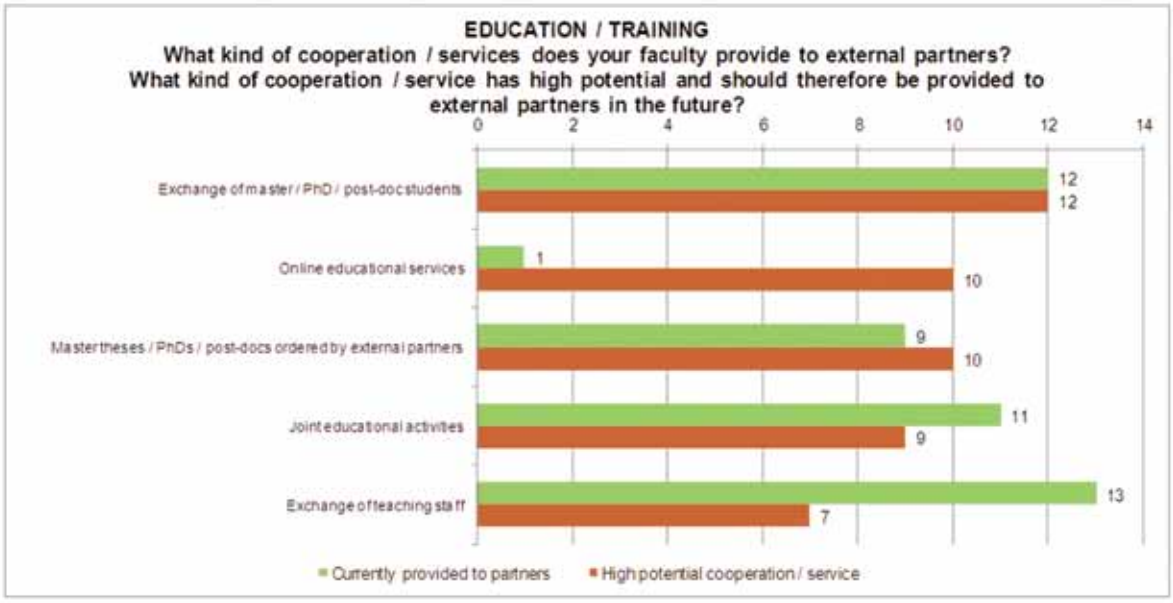


Figure 72: Education and training for external partners, faculty

In total, cooperation in education, also according to faculties' estimates, is rated as having high potential. While cooperation in online educational activities is seen as having high potential, currently just one faculty engages in this sphere of educational cooperation. On the other hand, currently most faculties provide the exchange of teaching staff whereas half of the respondents do not rate this involvement as promising.

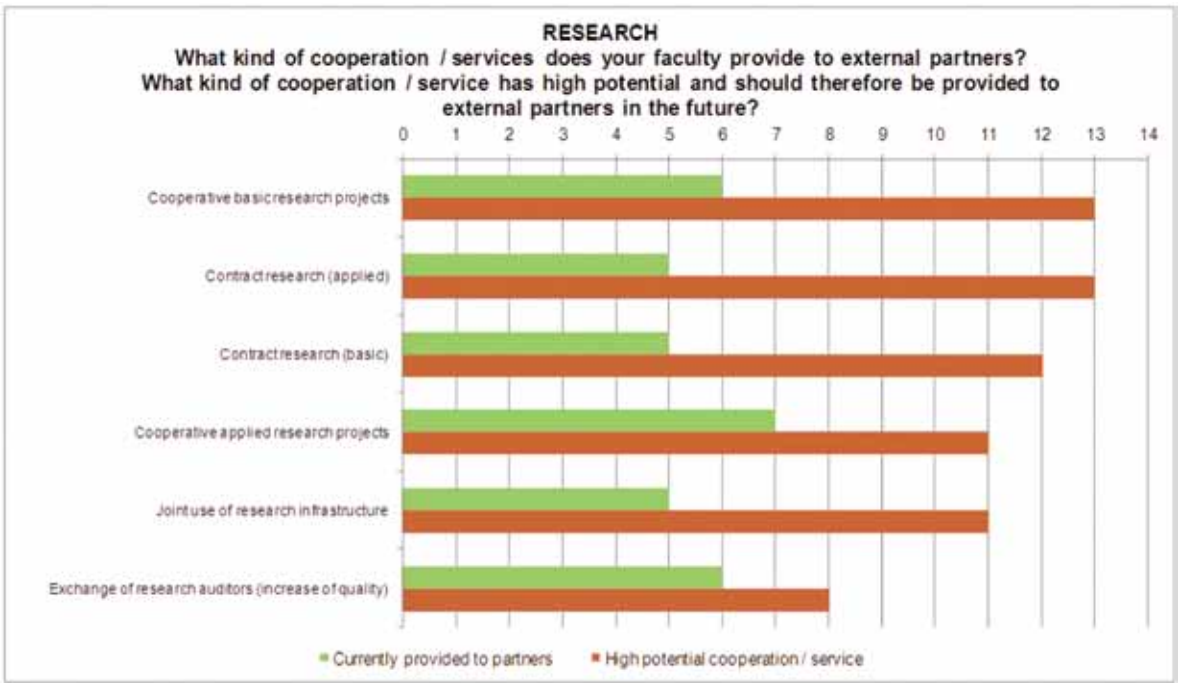


Figure 73: Research services to external partners, faculty

Research was assessed as having higher potential for future cooperative activities than education. According to the questionnaire, almost all kinds of research cooperation should be provided to external partners but not even half of the faculties provide research cooperation at the moment.The exchange of research auditors is rated somewhat lower.

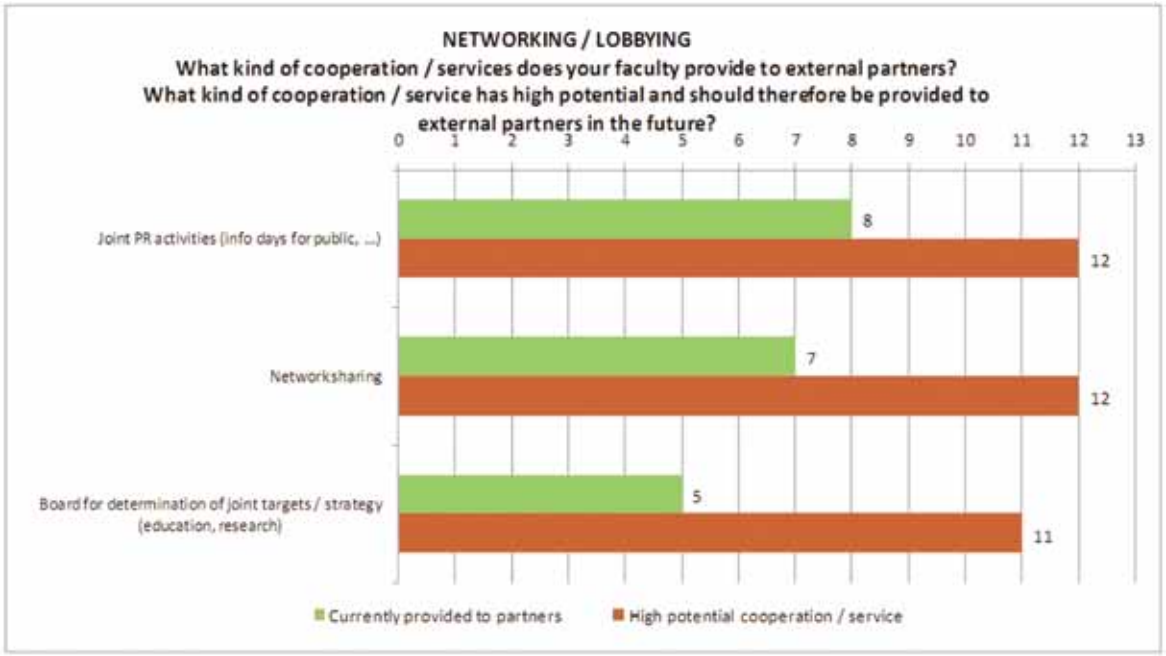


Figure 74: Networking and lobbying, faculty

Joint networking and lobbying activities are evaluated as having high potential for future cooperation. Especially when it comes to a method for implementing joint targets and strategies, room for more cooperative endeavours is still seen.

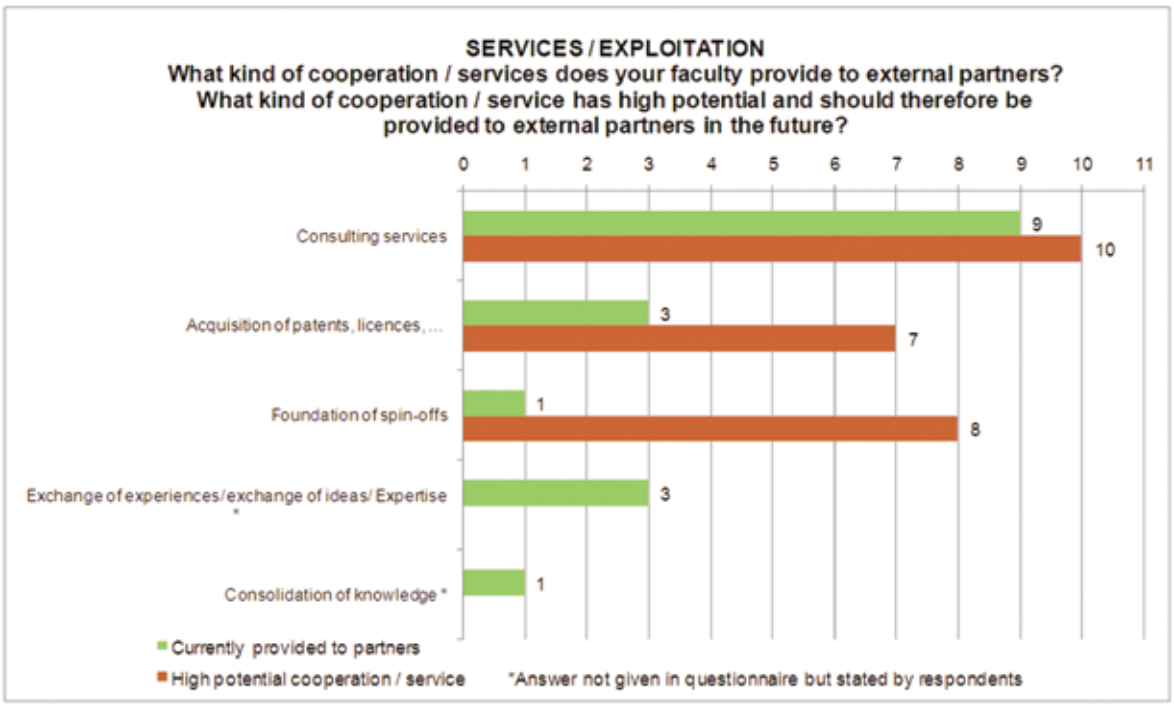


Figure 75: Services and exploitation, faculty

Cooperation in services and exploitation is evaluated as having high potential by most of the faculties. While consulting services are currently provided, acquisition of patents or licenses and foundation of spin-offs is more seldom practiced. For four faculties the exchange of experience, ideas or expertise or the consolidation of knowledge is stated as a service which is provided.

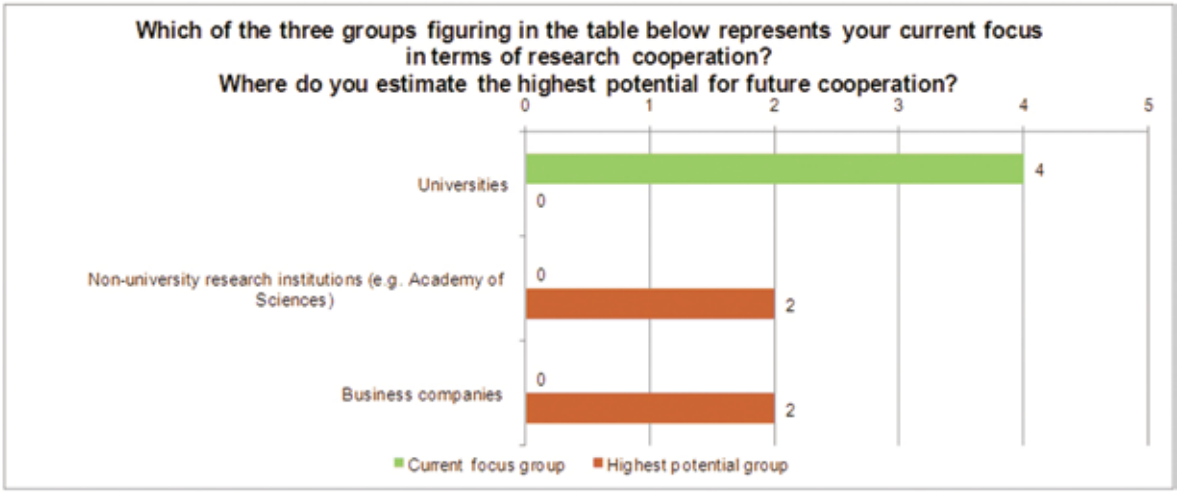


Figure 76: Current focus of research cooperation, university

Universities currently focus their research cooperation on other universities, though high potential for research cooperation with other bodies is reported.

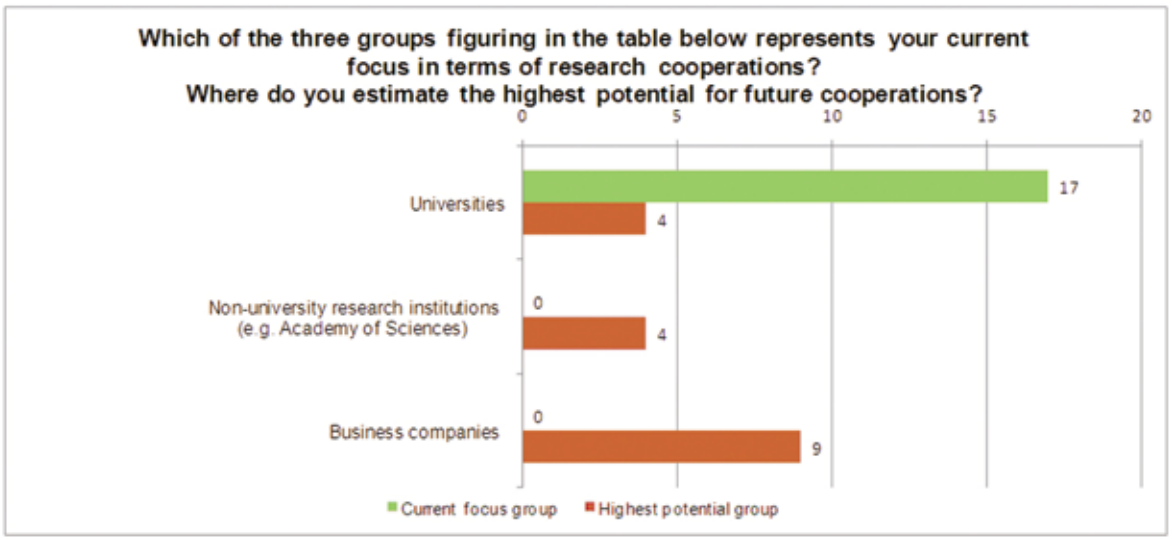


Figure 77: Current focus of research cooperation, faculty

Faculties currently focus on universities. The somewhat opposing prevailing circumstance is that the highest potential for future research cooperation is seen in non-university research institutions and business companies.

In the table below, according to the questionnaire, the most important partner universities of the assessed faculties are listed. The first column indicates whether an institution was named multiple times

Please specify the 3 most important partner universities (highest project volumes, long-term partnership) of your faculty.

Ss. Cyril and Methodius University

University of Belgrade, Faculty of Technology and Metallurgy, Serbia
University of Ljubljana, Slovenia
University of Maribor, Slovenia
University of Novi Sad, Serbia
University of Turino, Italy
University of Uppsala, Sweden
University of Zagreb, Croatia

University of Montenegro

Gdynia Maritime University, Poland
High Hotel School Belgrade, Serbia
University of Ljubljana, Slovenia
University of Belgrade, Department of Transport and Traffic Engineering, Serbia
University of Economics and Business Administration Vienna, Austria
University of Ljubljana, Slovenia
University of Maribor, Slovenia
University of Novi Sad, Serbia
University of Perugia, Italy
University of Poznanj, Poland
University of Rijeka, Faculty of Maritime Studies Rijeka, Croatia
University of Tirana, Albania
University of Trier, Germany

University of Prishtina

Agriculture University of Tirana, Albania
Arizona State University, USA
BOKU Vienna, Austria
University of Applied Sciences Joanneum Graz, Austria
Faculty of Humanities and Social Sciences Zagreb, Croatia
Faculty of Philosophy, Ljubljana, Slovenia
International Burch University Sarajevo, B&H
Tirana University, Albania
TUW
University of Hohenheim Stuttgart, Germany
University of Pittsburgh, USA
University of Staffordshire, UK
University of Tetovo, Macedonia

University of Sarajevo

BOKU Vienna, Austria
Erlangen University, Germany
FER Zagreb, Croatia
Mälardalen University, Sweden
Rutgers University, USA
University of Graz, Austria
University of Hohenheim, Germany
University of Life Sciences Aas, Norway
University of Ljubljana, Slovenia

Table 78: Most important partner universities, university

Cooperation with other institutions/organisations:

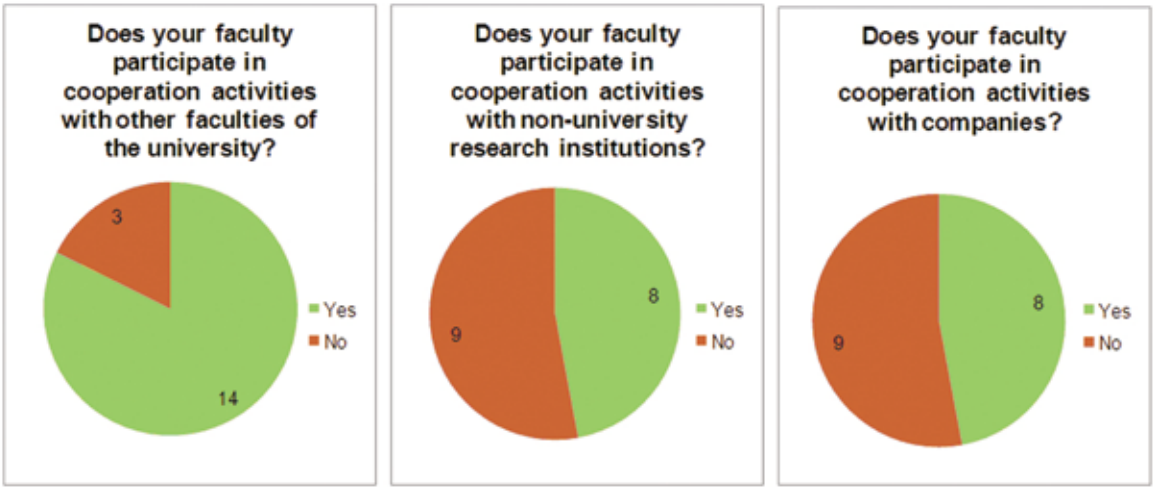


Figure 78: Cooperation with other institutions, faculty

14 of the participating faculties (82 percent) cooperate with other faculties of their university, three faculties (18 percent) state that they do not participate in cooperation activities with other faculties. Eight of the reviewed faculties (47 percent) engage in cooperation activities with non-university research institutions whereas nine (53 percent) do not. The same proportion remains for the numbers of faculties cooperating with companies or not cooperating with companies.

The subsequent table lists the most important partner faculties according to project volume and time of partnership.

Please specify the 3 most important partner faculties (highest project volumes, long-term partnership) of your faculty.

Ss. Cyril and Methodius University

Faculty of Forestry
Faculty of Natural Sciences
Faculty of Veterinary
Mechanical Faculty, Maribor
Technical Faculty, Turino
Technical Faculty, Novi Sad

University of Montenegro

Department of Electrical Engineering
Department of Mechanical Engineering
Economics Faculty
Faculty of Civil Engineering
Faculty of Economics in Ljubljana
Faculty of Economics in Belgrade
Faculty of Mathematics
Faculty of Mechanical Engineering

University of Prishtina

Faculty of Agriculture, University of Prishtina
Faculty of Applied Technical Sciences
Faculty of Economics
Faculty of Education, University of Prishtina
Faculty of Electrical Engineering
Faculty of Law, University of Prishtina
Faculty of Mathematics and Natural Sciences
Faculty of Mechanical Engineering
Faculty of Natural Sciences

University of Sarajevo

Faculty of Humanities and Social Sciences Zagreb, Croatia
Faculty of Mechanical Sciences, University of Sarajevo
Faculty of Philosophy Ljubljana, Slovenia
Faculty of Science and Mathematics
Faculty of Sciences, University of Sarajevo
Faculty of Traffic and Communication
Faculty of Veterinary Sciences, University of Sarajevo
International Burch University, Sarajevo, B&H

Table 79: Most important partner faculties, faculty

In the following enumeration the most important non-university research institutions are listed.

Please specify the 3 most important partners within non-university research institutions (highest project volumes, long-term partnership) of your university.
University of Sarajevo Federal Ministry of Agriculture, Water Management and Forestry Cantonal Ministry of Education MILKOS, Dairy Sarajevo Academy of Science and Arts Federal Meteorological Institute of Bosnia and Herzegovina Institute for Power Engineering
University of Montenegro Department of Culture Department of Education and Science Embassies CEEMAN National Tourism Organisation GTZ

Table 80: Most important non-university research institutions, university

The following table provides details stated on the faculties' cooperation with non-university research institutions.

Please specify the 3 most important partners within non-university research institutions (highest project volumes, long-term partnership) of your faculty.					
Project title	*Duration*	*Project partners*	*Project volume in €*	*Publicly funded ?*	*Support progr./ donor*
Faculty of Agriculture and Veterinary, Prishtina					
Animal Welfare	< 1 year	UK Government	8,000	yes	
Kosovo and Austria Partnership – project for Organic Farming	< 1 year	Austrian Government	10,000	yes	
Kosovo and Austria Partnership – project for Vegetables	< 1 year	Austrian Government	10,000	yes	
Kosovo and Austria Partnership – project for Cereals	< 1 year	Austrian Government	10,000	yes	

SEEDN-et Plant Genetic Resources	3-5 years	University of Uppsala – Sweden University of Tirana – Albania University of Skopje – Macedonia University of Novi Sad – Serbia University of Belgrade – Serbia University of Sarajevo – BiH University of Podgorica – Montenegro	92,000	no	
Faculty of Electrical and Computer Engineering, Prishtina					
	3-5 years	University of Applied Sciences Joanneum		yes	ADC
	1-2 years	University La Sapienza, Rome, Italy, University of Applied Sciences Joanneum, Graz, Austria		yes	TEMPUS
Master study programme in Computer Sciences	3-5 years	IT Carlov, Ireland, University La Rochelle, France	350,000	yes	TEMPUS
Enhancement of telecommunication education – master study programme	3-5 years	University of Pittsburgh, USA	400,000	yes	USAId
Faculty of Agriculture and Food, Sarajevo					
AGRIPOLICA	3-5 years	Slovenia, Germany, SEE Universities, Slovakia, Latvia, Romania, Bulgaria,	500,000	yes	FP 7
Faculty of Electrical Engineering, Sarajevo					
		Federal Meteorological Institute of BiH, Hydrometeorological Institute Banja Luka, Faculty of Natural Sciences Sarajevo, Faculty of Natural Sciences Banja Luka, ETF Banja Luka		yes	FP7
		El. Eng. Faculty Banja Luka, El. Eng. Faculty East Sarajevo, Faculty of Natural Sciences Sarajevo		yes	FP6
SEEREN2	3-5 years	BIHARNET		yes	FP6
Intelligent procedures for adjustment/controlling of vehicles and vehicle components (“Intelligente Verfahren zur Regelung von Fahrzeugen und Fahrzeugkomponenten“)	1-2 years	University Erlangen		yes	DAAD BHISP

Faculty of Philosophy, Sarajevo					
Students, teachers and administration exchange	3-5 years	Faculty of Philosophy Ljubljana, Faculty of Humanities and Social Sciences Zagreb, Burch University, Sarajevo		yes	

Table 81: Most important non-university research institutions, faculty

Please specify the 3 most important partner companies (highest project volumes, long-term partnership) of your faculty.

Ss. Cyril and Methodius University

Macedonian power company
Agency for entrepreneurship promotion
Pelagonija, Bitola
Zito Vardar, Veles
Bovin, Negotino

University of Montenegro

GTZ – German Technical Support
ENSI, Oslo, Norway
Adriatic shipyard
HiCAD, Novi Sad, Serbia
Port of Bar
Port of Kotor

University of Prishtina

KEK
PTK
IPKO

University of Sarajevo

BH Telecom
FDS, Sarajevo
MILKOS, Sarajevo
Power Utility
Hermes Soft Lab
ZIM, Zenica

Table 82: Most important companies, faculty

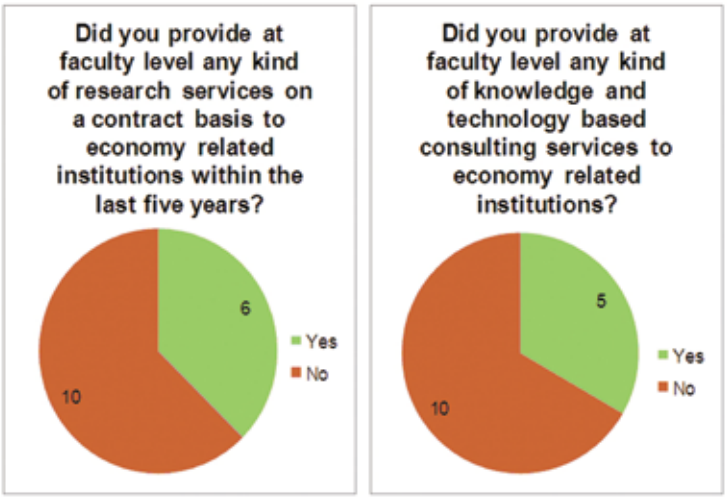


Figure 79: Research or consulting services, faculty

According to the answers given, six of the faculties (37 percent) engaged in research with economy related institutions on a contract basis and ten faculties (63 percent) did not. Almost the same is true for the provision of knowledge and technology based consulting services; five faculties state they provide such services whereas ten answered in the negative to this question.
Details on each kind of cooperation are provided in the following three tables:

Please specify the research projects with the highest project volume.[4]			
Title of programme	**Partner contracting body**	**Duration/ years**	**Volume**
Analytical solutions of some families of the nonlinear inverse problems	Ministry of Science	3	€ 100,000
Animal Welfare	UK Government		€ 8,000
Certification of vehicle characteristics	Ministry of Transport and Telecommunica-tion	3	-
Evaluation of transport and tourist potential: Study of Development of Tourism & Transport in Montenegro	Ministry Science	-	€ 40,000
Kosovo and Austria Partnership – project for Cereals	Austrian Government	1	€ 10,000
Kosovo and Austria Partnership – project for Organic Farming	Austrian Government	-	€ 10,000

Kosovo and Austria Partnership – project for Vegetables	Austrian Government	-	€ 10,000
Labour Market Oriented Curriculum Programme (LMOCP)	ADC	-	€ 35,000
Researches of optimal linking between maritime and continental transport systems	Ministry of Science	3	€ 100,000
SEEDN-et Plant Genetic Resources	Sweden Government	3	€ 92,000
The Special Tran Functions Theory	Ministry of Science	2	€ 40,000
Strategy of agricultural development in BiH	Federal Ministry of Agriculture, Water Management and Forestry	1	€ 100,000
Electrical Power Protection Training	BH Telecom	2	

Table 83: Research projects with highest volume

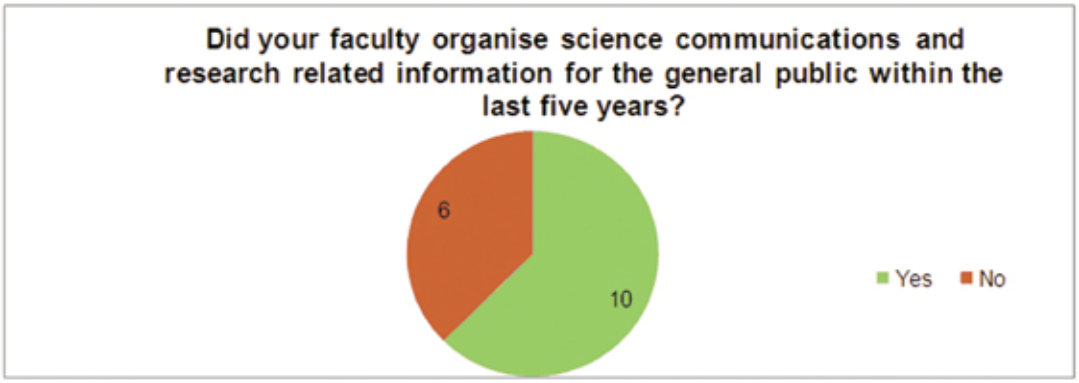


Figure 80: Research related information to public, faculty

Science communications and research related information for the general public have been provided and/or organised by ten faculties (63 percent); 6 faculties (37 percent) did not provide this kind of service. The subsequent figure indicates how many faculties reported to organise specific kinds of public events within the last five years.

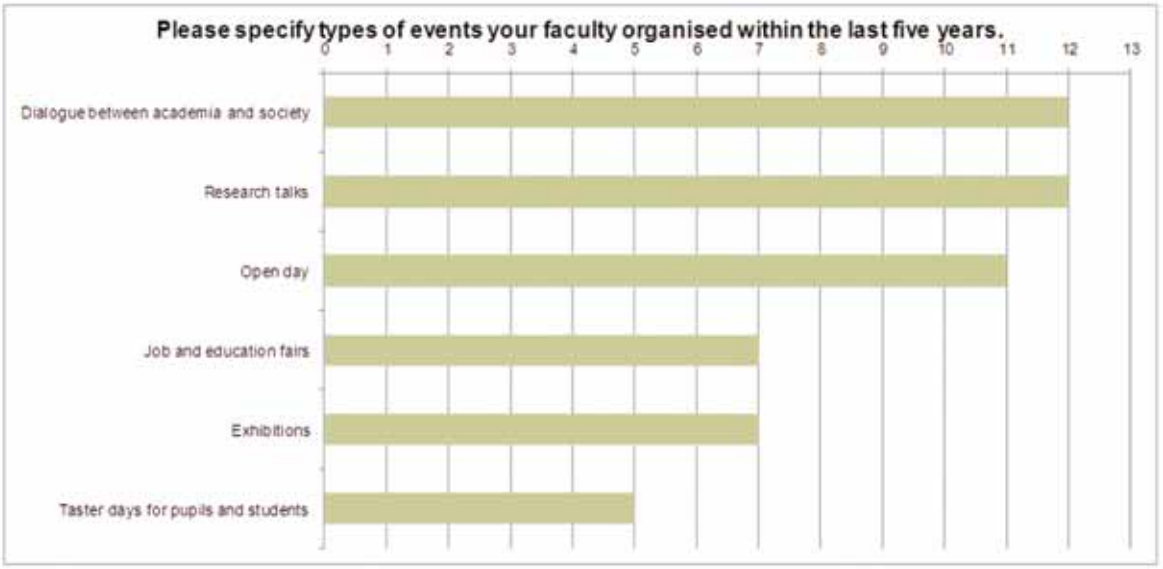


Figure 81: Events organised in last 5 years, faculty

Moreover, the following events were also mentioned:

- Presentations at high schools
- Cultural events in cooperation with foreign countries' embassies
- World Congress on Comparative Education
- International Conference on B&H in the period of the Austrian-Hungarian Monarchy
- WFD implementation with an EU Project as a support to the Ministry of Environment

10.7 Research Evaluation

Does your university have a research evaluation system that systematically records the research performance of the university?

None of the assessed universities reported having a research evaluation system that systematically records the research performance of the university. The University of Sarajevo and the Ss. Cyril and Methodius University nonetheless stated details on the information which is collected to evaluate the university's research.

Which of the following information is collected by this evaluation system? Please check the appropriate boxes.

The Ss. Cyril and Methodius University reports collecting the number of research projects. For the University of Sarajevo the following list holds:

Which of the following information is collected by this evaluation system?	
University of Sarajevo	
Number of publications	Yes
Number of scientific employees	Yes
Number of research projects	Yes
Number of founded companies	No
Amount of third party funds	Yes
Number of patents	No
Number of licenses	No
Number of visiting professors	Yes
Number of research stays	Yes

Table 84: Items collected by evaluation system, university

Reportedly the university and the faculty administration have access to the evaluation system whereas the general public may not access the data. Researchers and university and faculty administration are responsible for updating of the collected information.

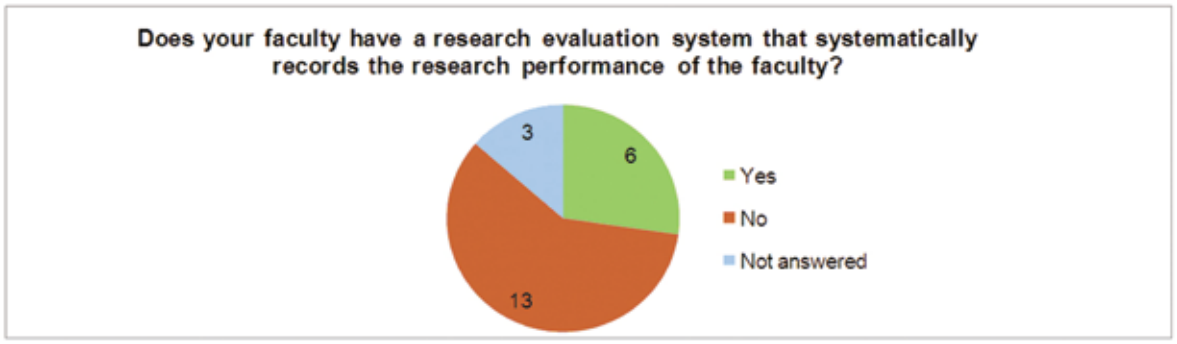


Figure 82: Evaluation of research performance, faculty

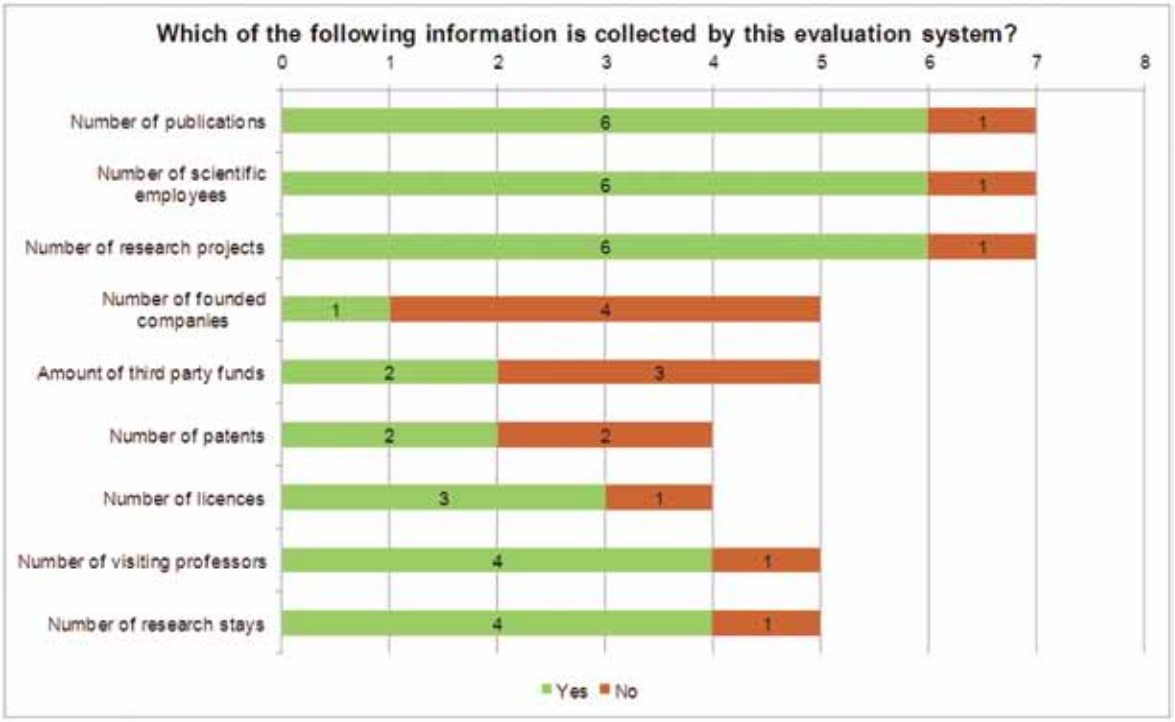


Figure 83: Items collected by evaluation system, faculty

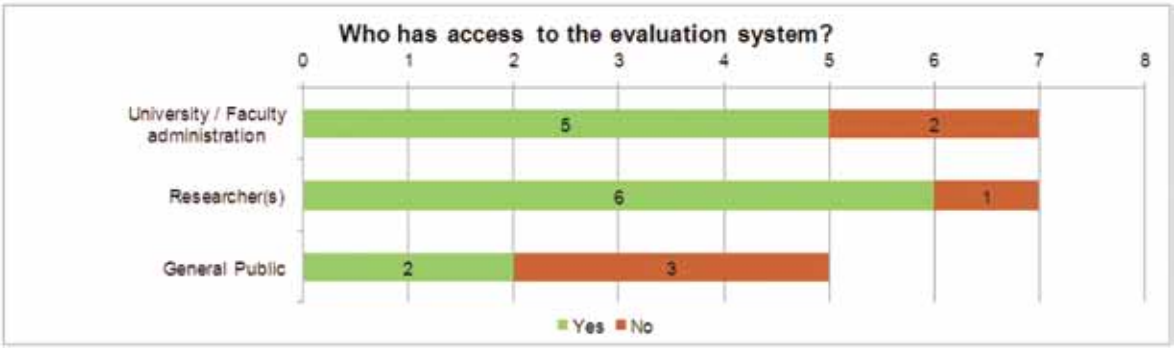


Figure 84: Access to evaluation system

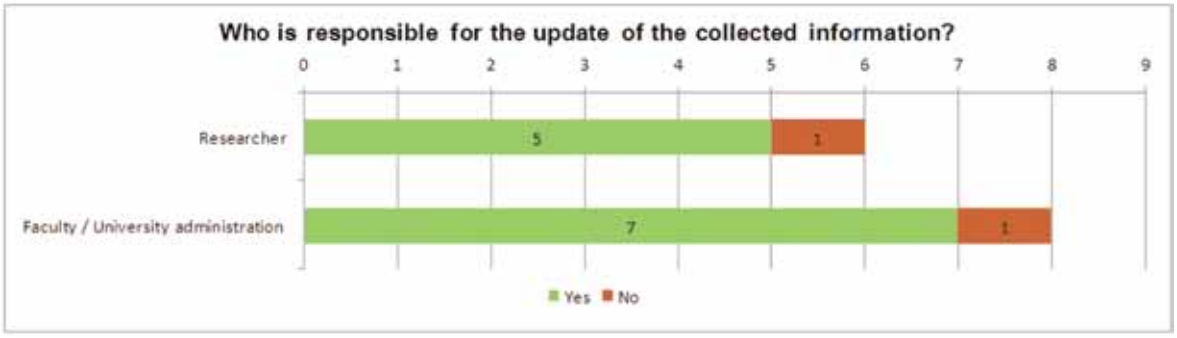
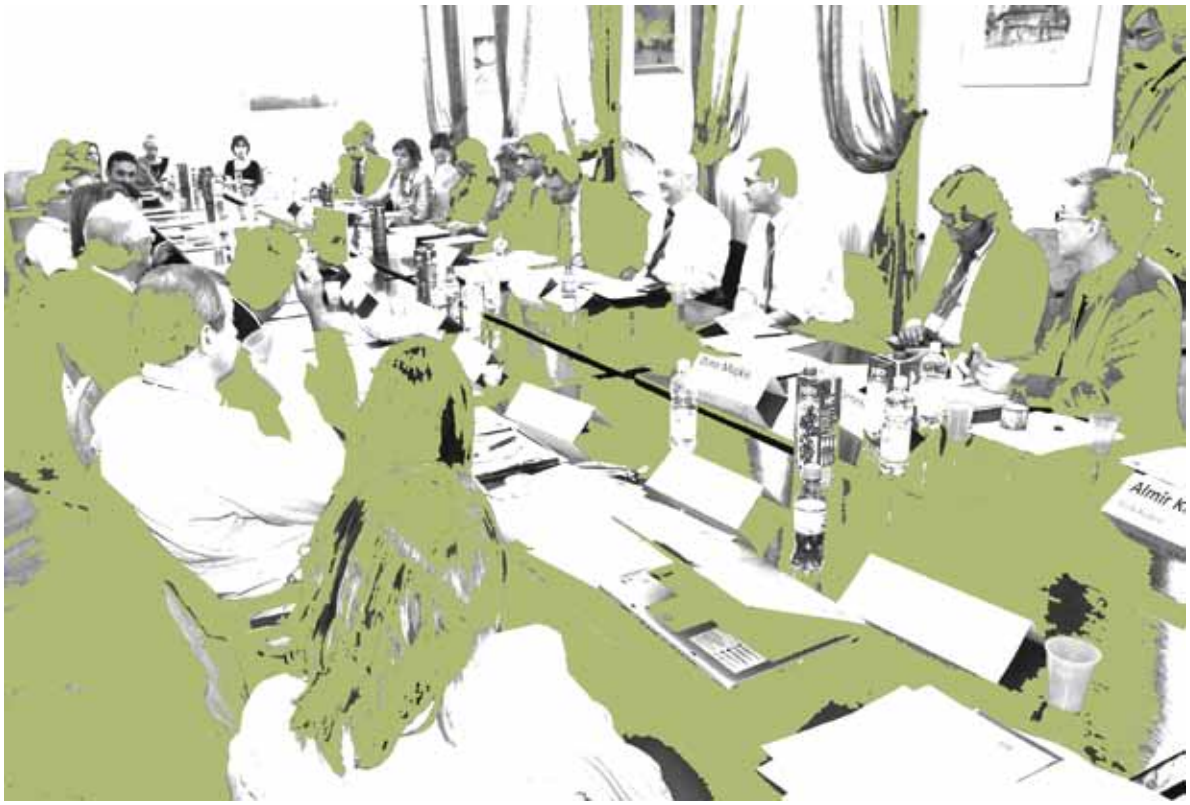


Figure 85: Responsibility of data collection for evaluation



11 Future Perspectives

KEY RESULTS

Networking, increasing the visibility of activities and the training of highly qualified staff are seen as the most promising potentials for future cooperations of the PCUs with other stakeholders.

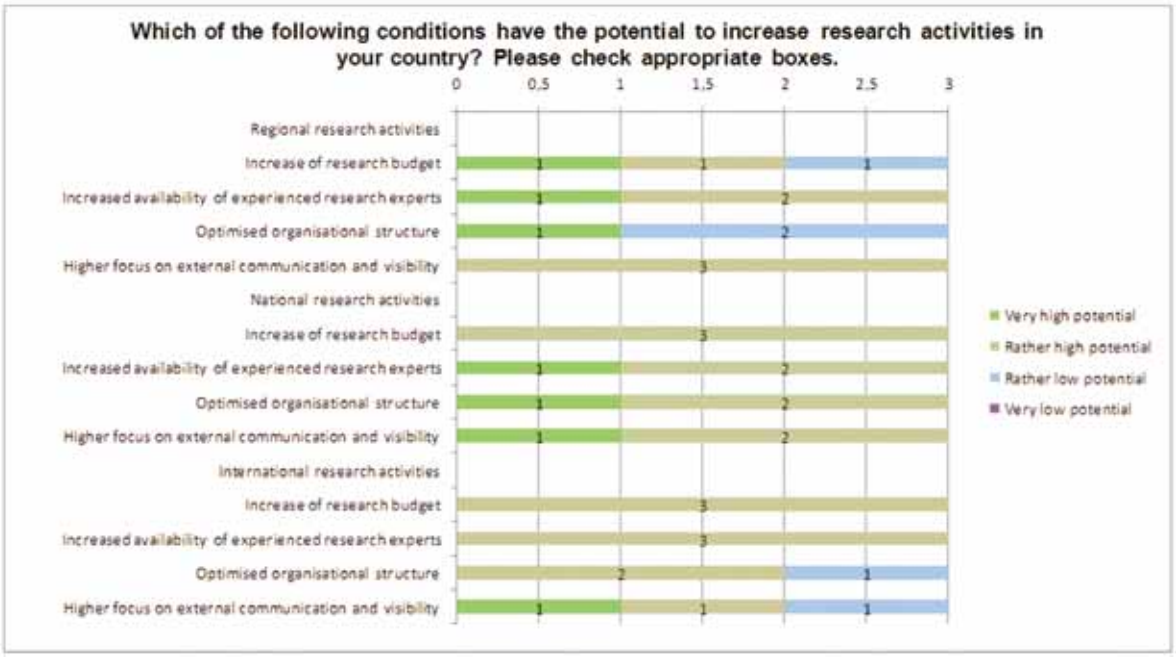


Figure 86: Conditions with potential to increase research activities, university

In total, national research activities are rated as having higher potential for increasing research activities in the country than regional or international activities. The University of Sarajevo does not provide data.

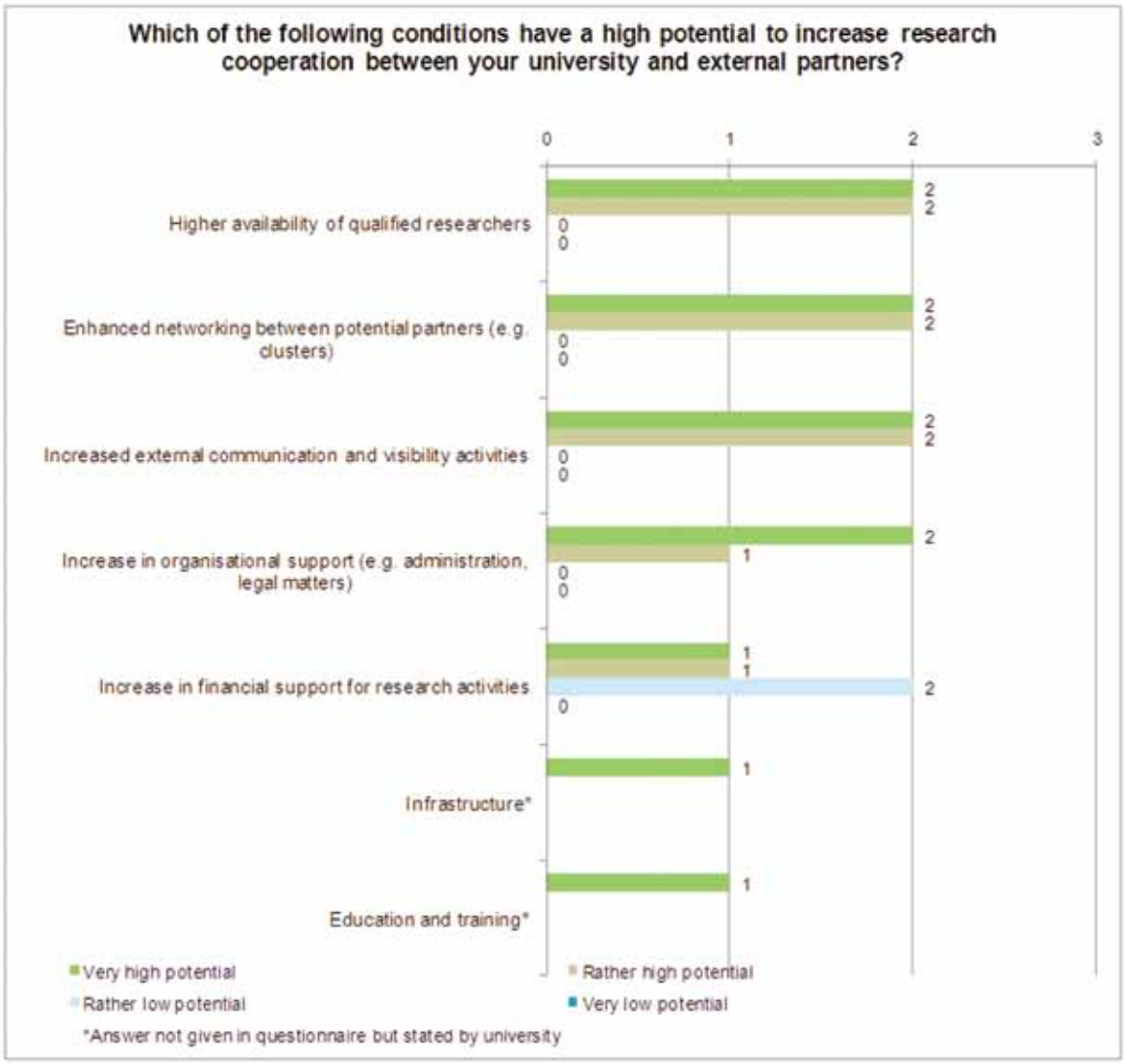


Figure 87: Conditions with high potential to increase cooperation, university

Higher availability of qualified researchers, enhancement of networking between potential partners, increased external cooperation and an increase in organisational support are seen as having the highest potential to increase research cooperation between the university and external partners. An increase in financial support is given lower priority.

The following list indicates the basic conditions which would improve research cooperation between the university and external partners according to the respondents' answers.

What basic conditions have to be fulfilled in order to establish or increase research cooperation between your university and external partners (e.g. legal framework)? Please indicate the 3-5 most important conditions.
Infrastructure Qualified and trained researchers, researcher training, staff mobility, administrative staff training Financial support, funding programmes Developing research activity priorities within the country (research strategy) To have the mutual understanding of the aspect Identify potential partners interested in research in different fields To have already a signed bilateral agreement Legal framework To be an institution accredited by national legislative

Table 85: Fulfilment of basic conditions to increase research activities, university

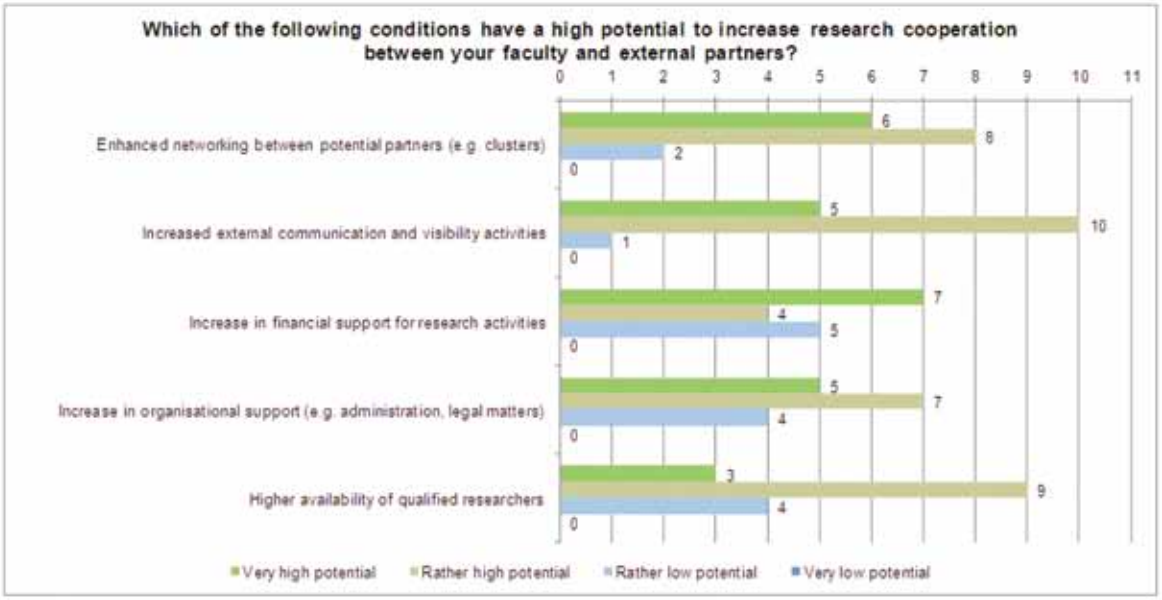


Figure 88: Conditions with high potential to increase cooperation, faculty

Enhanced networking and external communication activities are ranked as having high potential for increasing research cooperation between the faculty and external partners more often than increases in financial, organisational or human resources' support. In general, many respondents evaluate the given possibilities as having quite high potential.

What basic conditions have to be fulfilled in order to establish or increase research cooperation between your faculty and external partners (e.g. legal framework)? Please indicate the 3-5 most important conditions.	
Occurrences	
	Financial Conditions
2	Financial support
1	Fundraising activities for MA and PhD study
1	Fundraising for the establishment of the research institutes at the Faculty
1	Improvement of financial resources
1	Increase in financial support
1	Covering the mobility costs
	Material Resources
1	Improving research facilities at our faculty
1	Improvement of research infrastructure
1	Increase in infrastructure (labs, equipments, etc.) according to the needs
1	Institute equipment
1	Lab equipment
	Human Resources
2	Human resources
1	Increase in internal research capabilities
1	Increase in human capacities (young researchers, etc.)
1	Improvement of motivation of researches
1	Team building of young researchers
1	Language skills
	Research/Scientific
1	Identify research and development priorities in agriculture
1	Internal research capacity building
1	More orientation of the faculty towards research instead of teaching
	Organisational
2	Fulfilment of Bologna reform objectives by 2011
1	Possibility to manage projects (FP7), etc.
1	Improvement of administrative capacities
1	Increase in organisational support
	Legal
5	Legal framework (*given as an example in questionnaire)
2	Projects for economic development

	Networking/Lobbying
1	Increased international visibility of the faculty
1	Increasing the level of recognising the non-university sector as a sector of partnership

Table 86: Fulfilment of basic conditions to increase research activities, faculty

12 Conclusions

The self-assessment which was conducted in the framework of the Tempus Project “Creating R&D Capacities and Instruments for boosting HE-Economy Co-operations” was a first step towards analysing the research and development situation at each PCU and its surroundings. It is important to bear in mind that such an assessment is not undertaken by the PCUs on a regular basis but is rather a new thing to the university and its staff. Seen in this light, it becomes clearer why in some cases the data given by the faculties is not always in sync with that given by the university. In many cases, the information flow between those entities is still somewhat low and leaves room for improvement. This is mostly owned to the still ongoing integration process of the PCUs which is at a very different level across the various countries and universities.

This fact leads to the next assumption, namely that a great deal of information asked for in the framework of this self-assessment is still not surveyed, at least not on a systematic basis. The self-assessment can be seen as one initiative of many to come, to bridge this lack of information and to raise awareness among the academic staff, that such indicators are an important means to measure the efficiency and activity of the university, and thus its impact factor. Filling out the questionnaire therefore was also a kind of exercise for the university management (rectors/deans) to activate certain information channels in order to obtain all the necessary data.

To come to a close, at this point no additional information on the previous chapters will be given. However, the summary and key facts of each chapter can be found at its beginning.

12.1 Recommendations for measures to be taken

The present self-assessment analysis shows that all partner country universities share to a greater or lesser extent similar conditions and problems. If they face resembling problems they may also develop and put into place similar solutions. In other words, they can see the same "light at the end of the tunnel". For now it is of great importance to join forces in the framework of this TEMPUS initiative in order to really influence the current situation. Crucial steps in this process are to establish regional and international cooperations, to convince other people to join the project efforts, to get support on a national/official level and to establish research infrastructure. The main challenge which lies ahead will be the elaboration and implementation of an overall research and development strategy. In this context, it is crucial to also take into account the whole environment of research and development.

The following recommendations stem likewise from the self-assessment report at hand as well as the inputs during the whole project implementation process. Therefore, the propositions below have to be seen as time bound and works in progress.

Networking with relevant stakeholders and analysing the surrounding
Partner country universities (PCUs) should undergo a research market analysis in order to fully understand knowledge transfer mechanisms and to get an overview of the most important actors and stakeholders in their country. Universities first of all need to know their markets before they can act; therefore they need to undertake a closer analysis of their economic surrounding (e.g. relevant SMEs).

Create a network of networks in order to coordinate all important players and actors (who will be responsible for what?) within the innovation system of your country. Elaborate and offer information tools for companies. Universities are essential partners for the R&D funding of companies. For instance, universities can be important shareholders of cluster organisations. Companies also need information services that could be provided by universities. As a first step, cross-link all 4 partner country university centres, coordinate activities and exchange experiences (What worked out? What failed and why was that the case?). United information dissemination (e.g. via a web platform) and joint activities can have positive effects for all of them. Institutional partnerships can be established afterwards and communication will become much easier.

Building capacities and generating good practice examples
One possible capacity of a university may be the expertise to support SMEs in the generation of capital through innovation and knowledge transfer. Interfaces to the economy are often already widely spread at the university: e.g. employability centres, industry cooperation centres, etc. One next step can be to intensify the information exchange between these different centres. Another possibility may be to set up project proposals in a way that they include internships as a part of the project. Remember that it is crucial to generate third party funds in order to lead the R&D Service Centre in a sustainable way.

Good practice examples can influence the public opinion and relevant political stakeholders in a positive way. Try to find good stories about a successful research projects or other small initiatives and communicate them to the public by emphasising their positive socio-economic impacts such as the creation of new jobs entailed by the project, etc. One objective ought to be to give politicians stories that they can capitalise on, i.e. in terms of popularity. In this sense they can communicate to the public that

money spent on universities delivers actual and very visible results. One such success story can boost the whole R&D efforts of the university.

One recommendation therefore would be to train the R&D Service Centre managers in their networking and communication capacities with governmental representatives and other local or regional political stakeholders. R&D Service Centre managers may in this regard be able to give the higher education policy a spin in the right direction for the future. This is important since ministries can influence research activities directly by the means of funding and research programmes. On a more indirect and long-term level the above mentioned good practice examples may even result in the alternation of the whole national legal framework on higher education.

Working towards internationalisation

PCUs need to become capable of competing for the application for international tenders. This way they can acquire new funding and support other organisations in applying for calls. Furthermore, they need capacities to coordinate/lead cooperative international projects. Networking with international partners can be done on two different levels: small R&D projects can enable the university to get started and can then be multiplied. Experiences from international cooperation can then be transferred to the national level. Use international partnerships to promote your initiative and to put pressure on decision-makers/ stakeholders.

Taking a proactive role

Universities can and should take a proactive role for the promotion of research and innovation in the nation and the region at a political as well as at an industry level. It is important to develop an action plan and a strategy for the co-operation of government, market and universities and for the positioning of project development. The goal should be to position the university as an innovation driver of the region/ country.

Partner country universities need to elaborate a research related human resource strategy. Possible measures to be taken could be the establishment of a student/staff mobility programme or the introduction of a system that establishes links between partner country universities and research staff or students who have left for western universities (e.g. by alumni networks, Diaspora conferences, etc.)

As R&D Service Centre manager try to concentrate on things that you are in control of or that you can positively influence. It is also very important to start with realistic and therefore moderately high set goals since you might not be able to reach too highly set goals right from the start. In other words, concentrate on the low-hanging fruits: Universities could e.g. train companies on research topics (capacity building on innovation within companies). Therefore ideas should be developed in order to involve SMEs in the innovation process. R&D pilot projects will enable institutions to apply for and implement future projects.

Acting in concert

As R&D Manager it is one of your tasks to stick to the overall university strategy and play a strong role alongside with other entities of the university! One measure therefore has to be to set-up a situation of mutual trust between the R&D Service Centre, the university management (rectorate) and partners and stakeholders from non-university research institutions and the economy. Good work is nearly always a team effort, so try to involve all relevant stakeholders likewise in the research and development process.

13ANNEX

13.1 List of Figures

13.2 List of tables

(Footnotes)

1 No data provided in questionnaire; founding year according to websites of the universities.

2 The programme is applicable to economy-science cooperation, applicable to science-science cooperation or applicable to both.

3 The programme is a regional programme, a national programme or an international programme.

4 The figures in this table ought to be used with care because of technical problems in the assessment form.

Full project title: Creating R&D Capacities and Instruments for boosting Higher Education-Economy Cooperation

Short title: R&D Capacities

Project number: 145180-TEMPUS-2008-AT-SMHE

Contractor: University of Leoben, AT

Coordinator: WUS Austria, AT

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www.rd-capacities.org

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