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Co-ordination of Research Policies with the Western Balkan Countries

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Executive summary

The main task of this research was to identify the barriers which inhibit researchers from the Western Balkan countries and Turkey (WBC&T) from international R&D cooperation in order to provide policy makers with the analytical backgrounds to create policy measures for facilitating research cooperation.

This is the first study focused on identification of the factors which hamper the cooperation of WBC&T in the two types of collaborative projects: /1/ European Union Framework Programmes (FPs) and /2/ bilateral projects. The study has also investigated the differences in perception of barriers between WBC&T and EU MS within these two types of projects.

The main finding of the research is that **the pattern** (types and scores) **of barriers** as well as **motivation** for R&D cooperation is very similar for researchers from both groups of countries - WBC&T and MS - and for both types of collaborative project - FPs and bilateral. However, the analysis also revealed that **significant differences** between WBC&T and MS in the **perception of barriers** and **the intensity of cooperation are present.** In other words, although the researchers from WBC&T and MS share similar barriers, they present much greater difficulties for the researchers from WBC&T than for the researchers from MS. Besides, researchers from WBC&T participate in international research projects to a **significantly smaller extend.** Therefore, the different policy measures for building the capacities of WBC&T in participation in FPs are necessary compared to MS. In the case of **bilateral projects** no differentiation is needed concerning conditions and procedures of R&D cooperation.

The largest difference in **motivation** is the "availability of research equipment" which is, in contrast to MS, much more emphasised in WBC&T and points to the lack of adequate research infrastructure in WBC&T. The **three most important motives are the same for both groups of countries and consist of**: /1/building up new research partnerships and networks, /2/ access to new sources of knowledge and technology and /3/ professional challenge.

The **most important barriers** are classified as **administrative barriers and include: /1/** "Project management barriers" which are driven by the low capacity of researchers to submit and manage the project and /2/ "EC bureaucratic barriers" which are related to the modus operandi of EC administration and involves obstacles related to constant changes of the rules and procedures, duration of project evaluation, payment delays, etc. The next group of barriers are **institutional barriers at national level** (e.g. lack of the country's lobbying skills at the level of EU administration, low scientific image of a country, parochialism, etc.) and **socio-cultural and political barriers** such as political antagonism, overall political instability in the region and democratic deficits. The most intriguing finding is that **institutional capacities of research** organisation are not perceived as important barriers for research cooperation. Researchers from both groups of countries are satisfied with the ability of their management teams and leaderships to provide them with the professional support for participation in international research cooperation. Finally scientific **excellence barriers** are not perceived as important either in WBC&T or in MS illustrating that respondents are

confident in their scientific competences and connections as sufficient for participation in international projects.

The study concludes that capacity building of WBC&T for participation in FPs should include a proper mix of policy the measures at the two levels: science policy at the national level and administrative level of EC.

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Foreword

This report presents an analysis of data collected by the questionnaire-based survey on barriers in research cooperation conducted within the WBC-INCO.NET project (Work package 3, Task 3.3). WBC-INCO.NET is a consortium project financed by the European Commission within FP7 with the aim to support the cooperation between the EU member states (EU MS), countries associated to FP7 and the Western Balkan Countries and Turkey (WBC&T) in science and technology. The consortium includes 26 partners from 16 countries.

An important component of the project was the investigation of barriers in research cooperation of WBC&T in the two types of collaborative projects: /1/ European Union Framework Programmes (FPs) and /2/ bilateral projects with WBC&T. This is the first study focused on identification of the factors which hamper the cooperation of WBC&T in EU FPs and tried to identify the differences in perception of barriers between WBC&T and EU MS within these two types of projects.

The Institute of Social Sciences IVO PILAR from Zagreb, Croatia has the task to carry out a web-based questionnaire to identify barriers in RTD cooperation and present the results of the study.

The questionnaire was designed by a working group that includes, besides the research group form the Institute Ivo Pilar, the representatives of the Slovenian Ministry of Higher Education, Science and Technology (Work package leader), Project Management Agency in DLR and the German Federal Ministry of Education and Research. The workshop on the methodology and design of the web-based questionnaire as planned in Zagreb was not carried out, all discussions took place via virtual communication, e-mail-exchange and telephone.
The data was collected through Internet with the technical assistance of the Centre for Social Innovation from Vienna, the coordinator of the WBC-INCO.NET project.

PART ONE: SETTING THE RESERACH

1.1. Introduction

In the process of economic, social and political integration of the Western Balkan Countries (WBC) with the European Union (EU), the cooperation and mobility in R&D is considered as an important factor of facilitating and accelerating the transnational cohesion processes.

The R&D capacities of WBC have been greatly affected by the transition processes, economic slowdown, war damages in some countries, isolation from the international, (especially European) scientific cooperation[1], brain drain and underinvestment in research. Although there is no exact data about the intensity of WBC cooperation with WBC and EU member states (MS) on bilateral/multilateral basis or through FPs, it is commonly perceived that WBC lost a critical mass for conducting R&D (Shared vision, 2003). Besides, the available statistical data[2] show that WBC&T have significantly lower level of international research cooperation within FP compared to MS.

Therefore, revitalisation and reinforcement of R&D capacities in WBC is a prime task, while R&D cooperation is an important instrument for its accomplishment. The WBC are nowadays faced with the great challenge to overcome the weaknesses of R&D systems and to achieve the European standards in R&D performance for cooperation. R&D cooperation is seen as an essential tool for the future economic and political stabilisation and growth in the region. It is also an important prerequisite for the implementation of the Lisbon strategy in WBC, a common agenda for all the European countries for the transition to the knowledge based economy.

The R&D cooperation and mobility can be considered at two main levels regarding geo-political criteria:

- Intra-regional cooperation – internal R&D cooperation and mobility among the WBC,
- Inter-national cooperation – R&D cooperation and mobility between WBC and EU countries.

The intra-regional cooperation is mainly performed by the bilateral projects, while the international cooperation is performed by bilateral, multilateral projects[3] and by cooperation within EU Framework programmes.

[1] WBCs were not eligible for participation in the European S&T programmes for more than a decade. For example, Croatia has acquired a full membership in FPs only three years ago, on June 1, 2006.
[2] E.g. CORDIS
[3] Multilateral projects consist of all projects that involve several parties like: EUREKA, COST, JEI, UNESCO projects, etc.

The WBC&T are seriously lagging behind EU countries in research intensity as measured by GERD and a number of researchers. The exception is Croatia since investment in R&D amounted to 0.93% of GDP in 2007. There are only three countries among the New Member States of EU which invested more in R&D in 2007: Czech Republic (1.54% of GDP), Estonia (1.14% of GDP) and Slovenia (1.53% of GDP).

Table 1: Selected indicators of research intensity in WBC&T and EU 27

	GERD	BERD	Head count**	R&D personnel
Croatia	**0.93***	**0.38***	**10428[a]**	**16377[a]**
Serbia	0.40[d]	:	:	12079[a]
FYR Macedonia	0.3[a]	0.03[a]	2373[a]	1357[a]
Bosnia and Herzegovina	0.05[e]	:	:	:
Albania	0.18	**:**	**:**	**:**
Montenegro	1.09[c]		602[b]	
Kosovo/UNMIK	**:**	**:**	**:**	**:**
Turkey	0.58[a]	0.21[a]	90118[a]	105032[a]
EU 27*	**1.83**	**1.17**	**1983712**	**3240996**

Source: Eurostat R&D database; Eurostat Pocketbook on candidate and potential candidate countries, 2008 edition; National statistical offices, Ministry

Notes:

*) EU 27; HR: 2007

**) No. of researchers in the labour force

a) HR,TR, FYROM:2006

b) Montenegro: FTE;

c) Montenegro: 2004

d) Serbia: 2004, www.aso.zsi.at/attach/Brussels03022005-Popovic.ppt

e)BiH, 2004: SEE-ERA.NET, D2.2. Report on the RTD need of the WBC, Centre for Social innovation, Vienna, September 2004

Up to now, the efforts of EC to intensify WBC participation in international R&D cooperation assumed implementation of the specially–tailored programmes and large-scale programmes designed to facilitate WBC participation like the SEE-ERA.NET, INCO, ERA WESTBALKAN(+) or the current WBC-INCO.NET project. They put the stress on renewal of connections among the WBC, their cooperation and identification of common interest in order to strengthen mutual cohesion and networking. These instruments are quite different from scientific-based research projects by thematic priorities that require experienced scientists, solid administrative support and sophisticated or large-scale scientific infrastructure. However, majority of WBC countries have recently become the full members[4] of the EU framework programmes but their participation is rather modest since they do not have sufficient research capacities to participate in FPs at the same footing. The main question is – what are the reasons behind of such a modest participation in international cooperation.

[4] Only KOSOVO/UNMIK is still not associated country to the EU FP7.

Apart from the barriers of researchers mobility (which are quite bigger for WBC&T than for MS, e.g. visas), this research will try to reveal whether the barriers for R&D cooperation in scientific world universal or whether the specific context of WBC&T produces the specific barriers**.** It is reasonable to suppose that barriers of international research cooperation of WBC&T and MS are quite different as well as the policy measures for fostering this cooperation.

1.2. Results of some previous research

The R&D cooperation with WBC has been strongly supported by EC since 2000 e.g. Thessaloniki Agenda for the Western Balkans, Zagreb summit, and EC formal consultation in 2001.

The analyses of barriers in R&D cooperation of WBC countries were mainly focused on two aspects: researcher's mobility and obstacles in bilateral R&D cooperation.

Several studies have been produced, of which the most known are the following:

1. High-level Expert group on improving mobility of researchers, Final report, EC, 4 April, 2001;

2. Thematic Report: Barriers to international Mobility and the Integration of Researchers from Western Balkan Countries (WBC) in the European Research Area (ERA), FFG-Austrian Research Promotion Agency, September 2007;

3. National Systems of Research and Development in West Balkan countries, WP2 within SEE-ERA.NET project, Milica Uvalić and Davor Kozmus, Ljubljana 2005

4. Report on the RTD needs of the West Balkan countries, WP2 within SEE-ERA.NET project, Davor Kozmus, Ljubljana 2005

5. SWOT analysis: Systematic Information Exchange on Bilateral RTD Programmes Targeting Southeast Europe, Report on 14 countries, WP1 within SEE-ERA.NET project, Institute Ivo Pilar, Zagreb, 2006.

6. Report on analysis of systematic information exchange on bilateral activities at the project level in 11 countries, WP3 within SEE-ERA.NET project, Bulgarian research team

The first four studies are (EC, 2001; FFG-ARPA, 2007; Uvalić and Kozmus, 2005; Kozmus, 2005) focused among others also on the observation of researcher's mobility barriers. Studies identified 4 main types of obstacles, all being independent from each other:

1**. Legal and administrative obstacles to transnational mobility** (e.g. visa, residence permit and work permit, immigration restrictions, non-Schengen countries, etc.);

2. **Social, cultural and practical obstacles to transnational mobility** (differences in the social security systems and levels of taxation, lack of knowledge of the local language, barriers related to families such as partner's career, children's education or day-care, suitable accommodation, etc;

3. **Obstacles to European dimension in research careers** (longer absence is disadvantage for careers at home, research period abroad is not sufficiently recognised at home, inadequate funding for mobility, income gaps in comparison to Western countries are large and stimulate incoming mobility (attracting researchers from WBC to Western countries) and not outgoing mobility (attracting European researchers to undertake research outside Western Europe). The following criteria for choosing the partner country have been identified: scientific excellence, publication possibilities, institutional attractiveness, career development and revenues. Usually WBC are not able to meet these criteria.

4. **Obstacles to intersectoral mobility** (is not further analysed in this report).

The obstacles identified by the High-level expert group were summarized and described in the Mobility Agenda in 2001 (EC, 2001).

The next study – the **SWOT analysis** (Ivo Pilar, 2006) was focused on bilateral research projects of WBC and other countries. It was performed to produce an insight into strengths, weaknesses, opportunities and threats of ongoing bilateral RTD programmes between: Austria, Bosnia-Herzegovina, Bulgaria, Croatia, France, FYR of Macedonia, Germany, Greece, Hungary, Montenegro, Romania and Slovenia. Based on each country's self-evaluation and perception of various RTD cooperation issues it is a subjective analysis of data.

The main strength of bilateral S&T cooperation is that bilateral projects are easy to establish, have low costs and involve only few risks. Also, the exchange of information, experience and know-how increases the knowledge base of the partners as well as their practical experience. Crucial weaknesses are: limited budget, limited scope, and lack of infrastructure, bureaucracy, lack of evaluation and negative outcomes mainly in connecting to the business sector. It was found that opportunities of such cooperation can be divided into eight thematic categories: potential future collaboration /integration (ERA), access to research potentials /infrastructure, developing human potential, expansion /development /exchange of knowledge, innovation /modernisation, research-related, advantageous policy (funding) changes, and positive market-related outcomes. On the other side, the main threats of bilateral RTD cooperation can be found in following six categories: budget cuts /limitations, collaboration obstacles /barriers, development /knowledge gap, brain drain, political shifts or changes (political instability of the SEE region) and new regulations (such as Intellectual Property Rights).

All together, the results showed that bilateral S&T cooperation attractiveness of a country depends on its effort to facilitate cooperation; policy makers being the most important stakeholders in launching it. SEE-ERA.NET countries see Slovenia, France, Germany and Austria as model countries in this respect. The natural sciences are still the prevailing priorities, while social sciences, economics and humanities are not yet at the forefront of cooperation fields. Most of the countries find their application evaluation and selection systems quite excellent. The main issues one country has to consider in order to be able to assess how good its budget and practices are include: is the level of funding, the accessibility of information on existing and additional funding sources accessible, the level of administrative costs, the coverage of personnel costs by the funding, and the adequacy of the infrastructure and IT infrastructure. The study identified the three general clusters of countries in regard to participation and involvement in existing RTD cooperation: the first cluster includes Austria, Germany, Hungary, France and Slovenia; the second one includes Croatia, Bulgaria, Greece, Romania and Albania; and the third one includes Bosnia and Herzegovina, F.Y.R. of Macedonia, Montenegro and Serbia.

Finally, in spite of the hypothesis that old and new EU member states, candidate countries and Western Balkan countries should be treated differently due to "different historical and political background", the SWOT analysis showed that there is no need for differentiation between old and new member states concerning the situation, function, conditions and procedures of S&T cooperation.

Ad.3. The sixth study (SEE-ERA.NET, s.a) identified barriers to cooperation pertinent to bilateral projects as problems related to the five areas: /1/ problems in consortium building, /2/ proposals preparation, /3/ evaluation procedures, /4/ implementation problems, and /5/ problems on institutional level. These problems were analysed at the level of each of 11 counters. The main results reveal that the bilateral cooperation framework must undergo substantial changes in order to be consistent with the new global tendencies and imperatives and to serve the respective national priorities of the different countries and their strategic orientations and expectations. The results show that the status of the bilateral cooperation does not demonstrate favourable conditions corresponding to the capacities and expectations of the different countries. It happens to be determined primarily by traditional attitudes and orientations, while at the same time inevitably influenced by new expectations and aspirations. The comparison of these expectations and aspirations in the three groups of countries (EU 15, EU 10 and WBC) reveals the need for development of new orientations and policies to meet the needs of their further development and cooperation in a common EU framework. The needed new specific forms must be developed via heterogeneous agent networking among many different countries on a concrete basis and with a view to bilateral cooperation.

A very interesting study is the CREST study (CREST, 2007) carried out in 2007 about the internationalisation of R&D within the globalisation process. The challenges of R&D cooperation with WBC are settled in the broader contest of EU cooperation with the third countries[5].

[5] Third country" means a state other than an EU Member State and other than Associated Countries to the Framework Programme (cited from: A New Approach to International S&T Cooperation in the

The most recent studies on R&D cooperation with WBC are the studies produced in 2008 by the Information Office of the Steering Platform on Research from Vienna. One study (Solitander and Tzatzanis-Stepanovic, 2008) is dealing with researcher's mobility and identifies 10 important factors that influence low mobility, as follows: low developed R&D infrastructure, low awareness of the importance of international mobility, attractiveness of the research intuitions, language problems, recognition of degrees, low salaries and high taxes, insufficient national funding of research, vacancy postings only in local media, and weak social security system

The next study (Santa and Windischbaur, 2008) analyses the relation between specific needs of WBC in RTD and the possibilities of meeting these needs via available international RTD funding programs (needs/offers matrix).

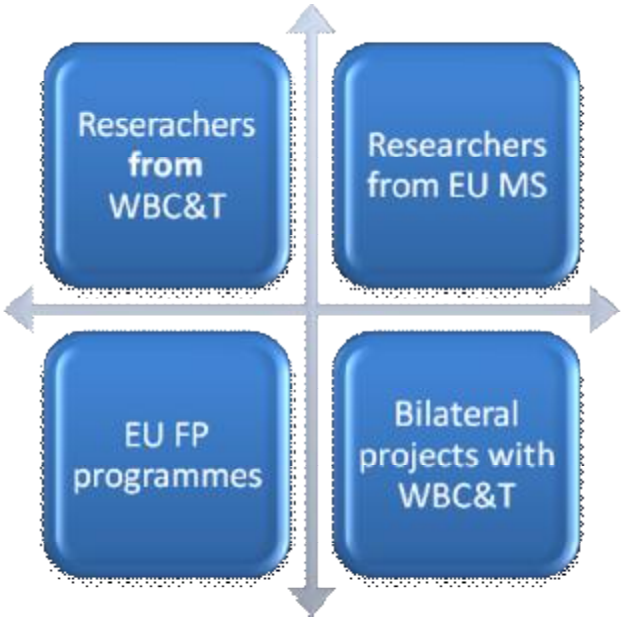
1.3. Research aims and design

The main task of this research was to identify the barriers which inhibit researchers from WBC&T from international R&D cooperation, primarily from EU FP and bilateral cooperation. The final purpose was to provide policy makers with the analytical backgrounds for creating strategic political measures for facilitating the participation of WBC in international R&D cooperation, primarily the EU framework programme.

The starting point of the research was the common opinion that R&D cooperation of WBC&T on both levels – intraregional/bilateral and international/European level is featured by many hurdles stemming from the scientific, economic, political, administrative, socio-cultural and other reasons. Therefore, the task of the research was rather complex and included the measurement of the four dimensions of R&D barriers: barriers for researchers from the both groups of countries - WBC&T and MS - in the two types of R&D cooperation - within bilateral projects with WBC&T and within EU FP (Figure 1). The reason behind this was to identify the possible differences in R&D barriers between these two groups of countries in the two main types of cooperation.

EU's 7th Framework Programme (2007-2013), Directorate-General for Research, EC, 2007, EUR22582). It should be added that the third countries are not allowed to take participation in councils and boards of FP having thus no influence on creation of EU science policy.

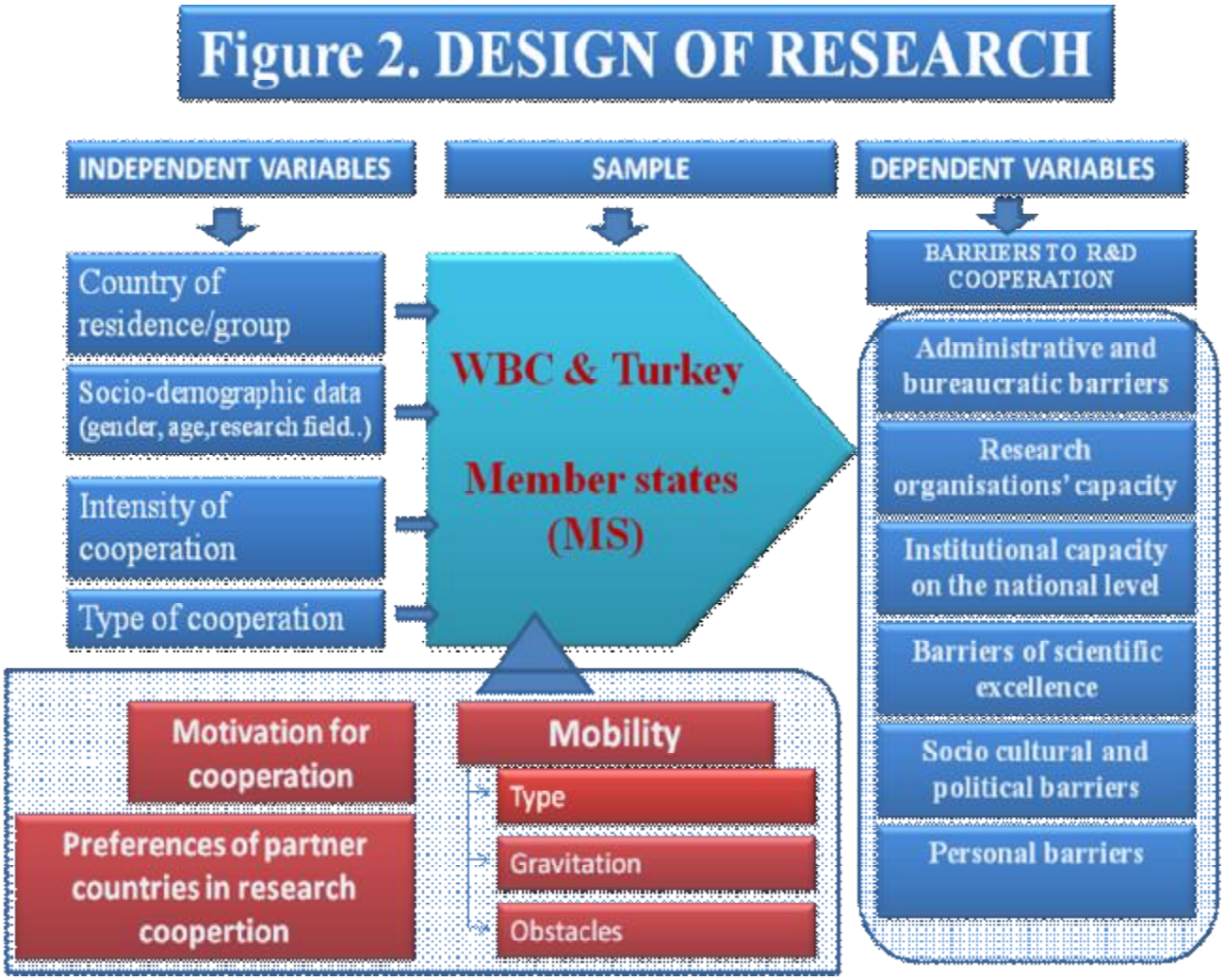
Figure 1: The four dimensions of barriers in R&D cooperation measured within research



The analysis of the intraregional cooperation was based on the bilateral projects within WBC, while analysis of international cooperation was based on the EU FP projects. The group of WBC included Croatia, Serbia, FYR of Macedonia, Bosnia and Herzegovina, Albania, Montenegro, Kosovo/UNMIK as well as Turkey since Turkey is a member of project consortium (WBC&T). The group of member states (MS) included the countries which are the project partners (Italy, Germany, Slovenia, Austria, Greece, Bulgaria) but also some other countries whose researchers responded to the survey (Hungary, Romania, France) and to a lesser extend some other MS (Slovakia, UK, Latvia and Sweden).

Our main dependent variable involved the barriers of cooperation. The barriers were analysed at two levels. The first-level analysis refereed to the **descriptive analysis** of the pre-defined types of barriers while the second-level analysis consisted of **factor analysis** for testing the correlation between the dependent variable (barriers) and the independent variables.

Figure 2: Design of Research



The following independent variables were identified as important factors of influence on R&D barriers (Figure 2):

- country of residence of respondents classified into the two main sub-groups of countries (WBC&T and MS);
- socio-demographic features of respondents (age, gender, scientific status, scientific disciplines, position, etc.);
- type of research collaborative projects cooperation (FP projects, bilateral projects with WBC&T and bilateral projects with MS);
- intensity of cooperation and intensity of cooperation index.

Besides, the survey was taken as an opportunity to investigate the three additional elements of cooperation, as follows:

1. motivation for cooperation;
2. mobility that includes: type of mobility, gravitation towards countries of cooperation and an insight in problems of mobility;
3. preferences in selection the partner countries for research cooperation.

The set of questions related to the barriers of cooperation was based on the six main types of barriers we have identified through the discussion with several researchers and administrative staff engaged in EU projects[6]:

1. administrative and bureaucratic barriers;
2. institutional capacity barriers on the level of research institution;
3. institutional capacity barriers on the national level;
4. barriers of scientific excellence;
5. socio cultural and political barriers;
6. personal barriers.

1. Administrative barriers are related to technical and bureaucratic difficulties in submitting projects proposals that involve professional skills such as: finding call and partners understand application procedures, accounting and financial rules, tax regimes, etc. They also include the communication problems with EC related primarily to the lack of harmonisation of researches' expectations and EC "rules of the game" such as projects acceptance rate, duration of evaluation procedures, financial obligation of the research institutions, etc.;
2. The term institutional capacity is borrowed from the institutional economic theories (North, 1990) and applies in everyday life for capacities of institutions, primarily of government bodies to secure the satisfactory level of management procedures and regulations to deliver the goods and services important for normal social and economic operations and progress. The institutional capacity at the level of research institution is related to the capacity of each researcher's institution to provide professional assistance and infrastructural support to researchers for international cooperation. Institutional capacity involves elements such as: equipment and human resources, commitment of leadership, provision of accounting and project management services, etc. The lack of these capacities could seriously harm the intensity and quality of international R&D cooperation or could, vice versa, significantly contribute to the developing of international cooperation by assistance and supporting action;
3. The institutional capacity at the national level referred to some general features of nation as a whole with the possible impact on R&D cooperation such as lobbing skills, scientific image of the country, parochialism or low national openness to international collaboration, etc.;
4. The reasons for including the scientific excellence in the barriers of cooperation comes from the common perception that researchers from WBC&T are not fully integrated into international research networks, primarily EU. It prevents them from the same level of engagement in cooperation as their EU colleagues and produces the lower scientific and competitive status of researchers from WBC&T in the global research arena. Scientific excellent barriers make a kind of vicious circle since lower scientific competitiveness at national, institutional and individual level produce lower level of integration and vice versa;
5. Another important dimension that prevents researchers from WBC&T to fully participate in international R&D cooperation is socio-cultural and political barriers. The indicators for these barriers are taken from the wider socio-

[6] Experts from the Institute „Ruđer Bošković", Croatian Institute of Technology (HIT) and the Ministry of Science, Education and Sports were kind to discuss the barriers of cooperation with us

economic and geo-political context of WBC&T in the region such as: political antagonism, nationalism and cultural differences, technological lagging, scientific inferiority, etc. The context is mainly shaped by the transition processes to market economy and different types of conflicts related to dissolution of ex-Yugoslavia, including wars. The intention was to investigate whether and to what extent such barriers play a role in R&D cooperation;

6. The personal barriers such as age, gender, and language skills are included in the survey to see if these types of barriers have any impact of R&D cooperation and to exclude them, based on empirical data, from the set of factors with influence on international collaborations.

1.4. Definition of the hypotheses

Apart from the descriptive analysis of the barriers, the testing of the hypotheses has been made to investigate the relation between barriers as the principal dependent variables and a range of independent variables such as group of country, type and intensity of cooperation, etc. The analysis included the relation between the two groups of countries (WBC&T and MS) and the perception of R&D barriers, types of collaborative projects and intensity of international R&D collaboration. Further on, the influence of the type and intensity of international cooperation on perception of the barriers was investigated. Finally, the impact of the standard socio-demographic variables such as gender, age, scientific grade, position, scientific field etc., on intensity, type of cooperation and perception of barriers were also investigated.

The hypotheses are, as follows:

1. Hypothesis: There is a difference in the perception of R&D barriers for WBC&T and MS.

2. Hypothesis: There is a difference in the three types of collaborative projects between WBC&T and MS.

3. Hypothesis: There is a difference in intensity of international R&D collaboration between WBC&T and MS.

4. Hypothesis: The difference in perception of R&D barriers are related to the three main types of R&D cooperation:
    a. EU framework programme;
    b. Bilateral cooperation with WBC&T;
    c. Bilateral cooperation with MS.

5. Hypothesis: The intensity of cooperation influences the difference in perception of R&D barriers.

6. Hypothesis: The difference in perception of R&D barriers is related to the socio-demographic characteristics of respondents (gender, age, type of institutions, position, scientific fields, etc.).

7. Hypothesis: The difference in type of collaborative projects does not depend on socio-demographic variables.

8. Hypothesis: The difference in intensity of R&D cooperation does not depend on socio-demographic variables.

1.5. Sample and methodology

The task of research was rather complex and included identification of four dimensions of barriers, i.e. barriers in the two group of countries within the two main type of R&D cooperation (bilateral projects and EU FP) (Figure 1). Since, all sets of questions are supposed to be measured for both the types of R&D projects, a special challenge was to create a web-based survey to meet this multi-dimensional requirement.

Following the aim of the research the most difficult task from the methodological point of view was to construct a sample of respondents and to compile a list of their e-mail addresses.

However, it was not possible to get the insight into the full set of data that would consist of all the EU FP projects with the participation of WBC-INCO.NET partner countries and bilateral projects with WBC. Therefore, we were not able to construct the representative sample of respondents according to the features of the full data set. Instead, we proposed another approach: to construct non-representative quota sample that assumes pre-defined quotas for each of the selected countries. Some of our project partners – FYR of Macedonia, Italia, Slovenia, Montenegro and Croatia- have provided us with the list of bilateral projects, while Austria and Germany promised to distribute the questionnaire among their scientific communities on their own due to the security reasons related to the public availability of the e-mail addresses.
The respondents who participated in EU FP projects have been planned to be selected from the CORDIS database. Unfortunately, it turned out that the identification of projects with the participation of WBC countries and MS partner countries within CORDIS is an almost impossible task. The structure of the database does not allow simple identification of WBC countries in projects while the e-mail addresses of researchers were not available due to security reasons. After a distressed period and many efforts to construct the list of e-mail addresses, we were still lacking a sufficient number of e-mail addresses of respondents for reliable statistical analysis (at least 300 responses have been planned to collect meaning that a minimum of 3000 addresses were needed due to the standard response rate of 10% for web-based surveys). Fortunately, the project coordinator Ms. Elke Dall provided us with the latest list of the project proposals within FP7 which included the participation of WBC countries. Using this list and the already collected e-mail addresses received from bilateral projects, we collected 18.000 e-mail addresses. After data reorganisation (e.g. deleting redundant data) we have selected and finally disseminated questionnaires to the 7,715 addresses. We have received 809 responses, much more than we expected. However, the shortcomings of non-representative sample were not possible to avoid. Therefore,

in the interpretation we kept in mind the fact that the sample was not representative for all participants from WBC&T and MS. The sample was non-probability purposive sample.

The survey was conducted on the period from September 8 to October 1, 2008.

The survey consisted of 22 questions and included four main parts:

1. general data on researchers/institutions;
2. general data on international cooperation;
3. priorities in selecting the country of cooperation and motives for cooperation
4. set of questions about barriers of cooperation including socio-cultural barriers.

The respondents evaluated items about the barriers of cooperation by two separate Likert scales, one for FP and one for bilateral projects.

In the survey the two types of the standard Likert scale were used. The first scale consisted of the six ordered response levels (1- Not important at all, 2- Not very important, 3- Neither important nor important, 4- Quite important, 5- Very important, 6 – I do not know, I cannot decide). These six scale categories were reduced in the data processing to the five categories. Another scale consisted of five ordered response levels (1- I do not agree at all, 2- I do not agree, 3- I cannot decide, 4- I agree, and 5- I fully agree).

Our main dependent variable - barriers to R&D cooperation- was analysed at the two levels. The first-level analysis refered to the **descriptive analysis** of the six types of barriers. These barriers were defined prior to conducting the survey and were included in the questionnaire as such. Second-level analysis consisted of **factor analysis** of all 58 items included in those six sets of variables in order to reduce the number of items and to get the scales of barriers which were used for testing the correlation with the independent variables.

The last part of analysis included a descriptive analysis of:

- motives for cooperation;
- mobility that includes: type of mobility, gravitation towards countries of cooperation and obstacles to mobility;
- preferences in the selection of the partner countries for research cooperation.

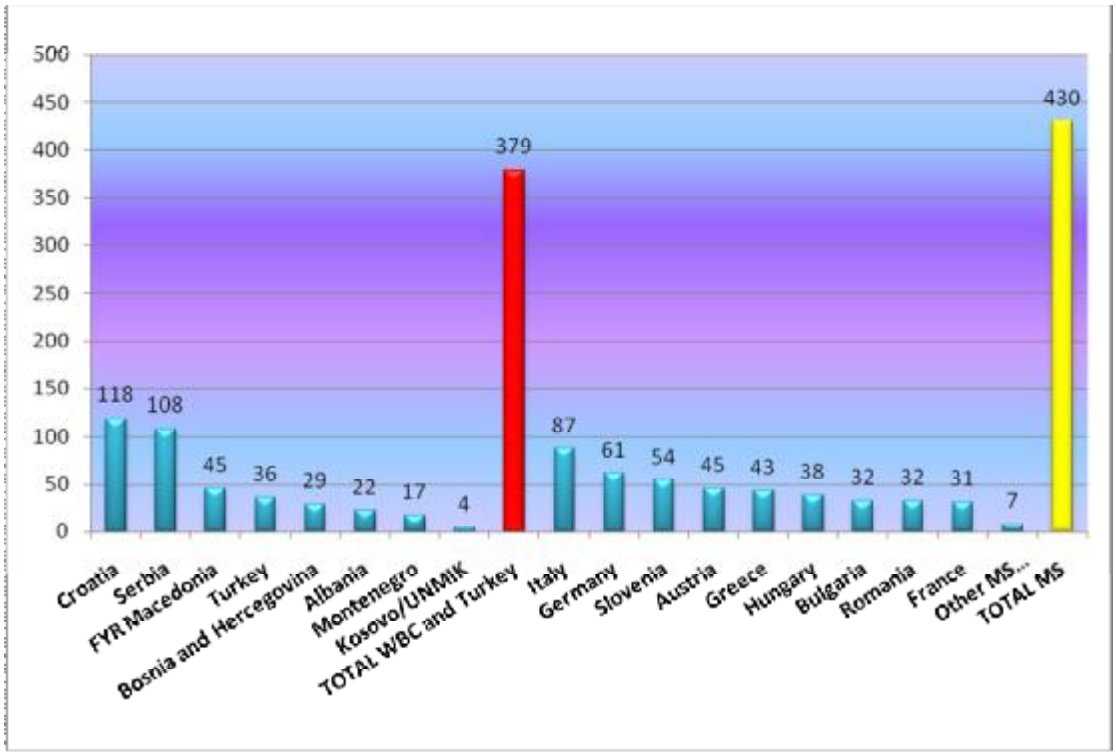
PART TWO: DATA ANALYSIS

2.1 Socio-demographic characteristics of respondents

The web-based survey resulted in 809 responses that make a response rate of 10.49 percent, quite satisfying rate for web-based surveys.

Both groups of countries, WBC&T and MS were equally represented since 379 or 46.8% of responses came from WBC while remaining 430 or 53.2 % came from MS (Figure 3). The largest number of responses in absolute and relative terms came from Croatia and Serbia since almost 30% of all the respondents have the permanent residence in these countries (Annex, Table1).

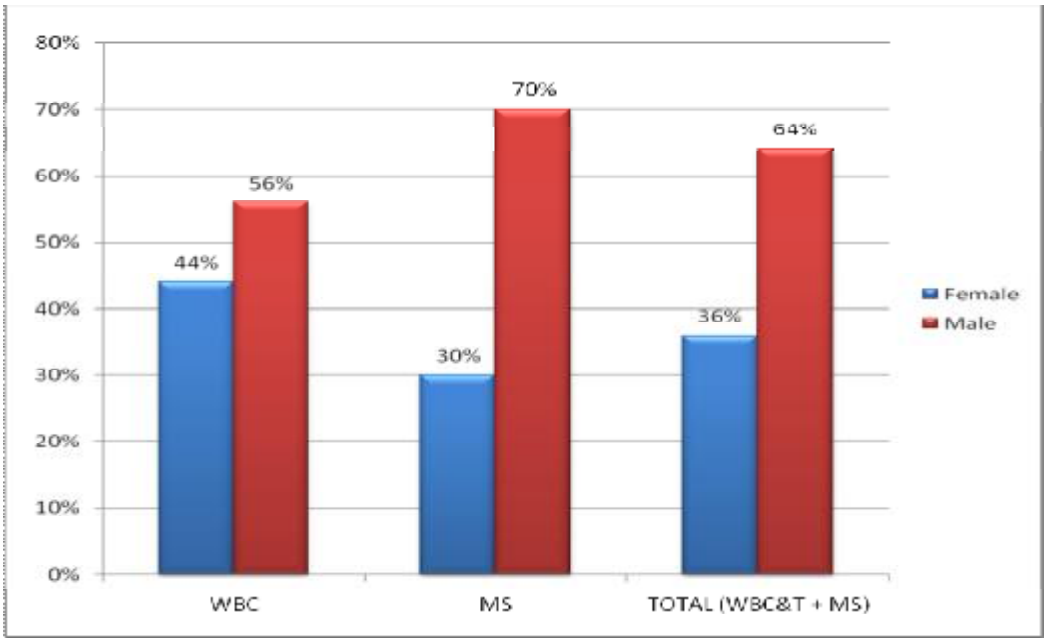
Figure 3: Number of respondents by country of residence



The socio-demographic characteristics of the respondents are rather similar regarding the group of countries, research area, age, current position and type of institution.

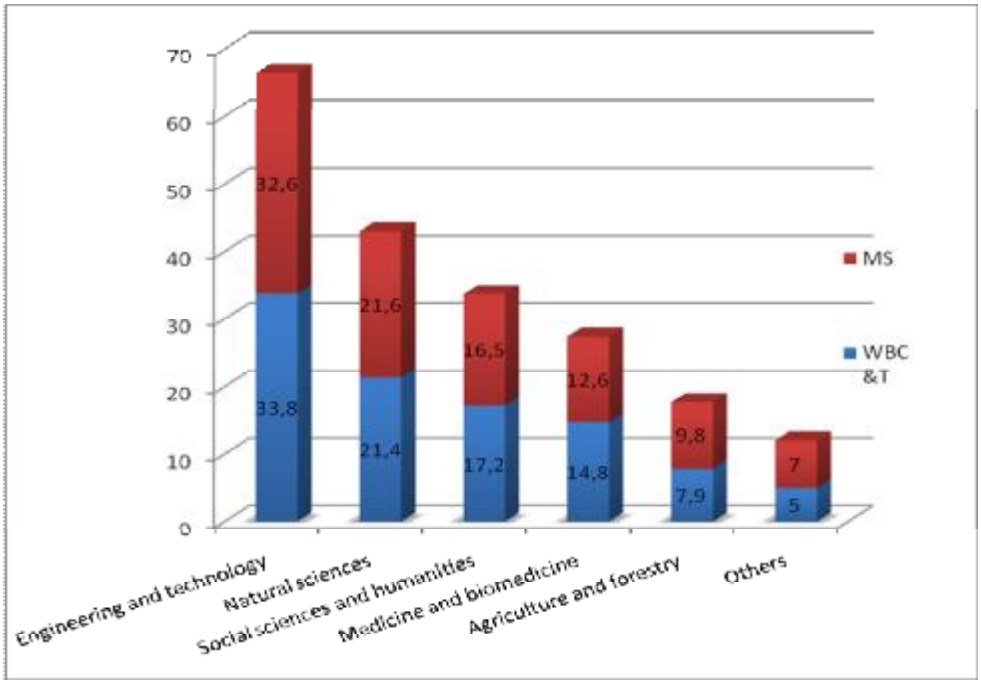
There is a slight difference in gender since 70% of respondents from MS countries are male and only 30% are female. In WBC countries the distribution by gender is more harmonised since 44% of respondents are female and 56% are male (Figure 4).

Figure 4: Respondents by gender



Majority of respondents in both groups of countries are engaged in engineering and technology (about 33%) and natural sciences (about 21%). About 16-17% of them are dealing with the social sciences and humanities and the next 8-10% are in agriculture and forestry. The remaining 5 to 7% of respondents belong to other research areas (Figure 5).

Figure 5: Respondents by research area



Considering the main research fields, it is interesting that male respondents are the dominant group in all of the fields of research, especially in engineering and

technology (75% males and 25% females) except social sciences and humanities (51,5% females, 48,5% -males) (Table 2).

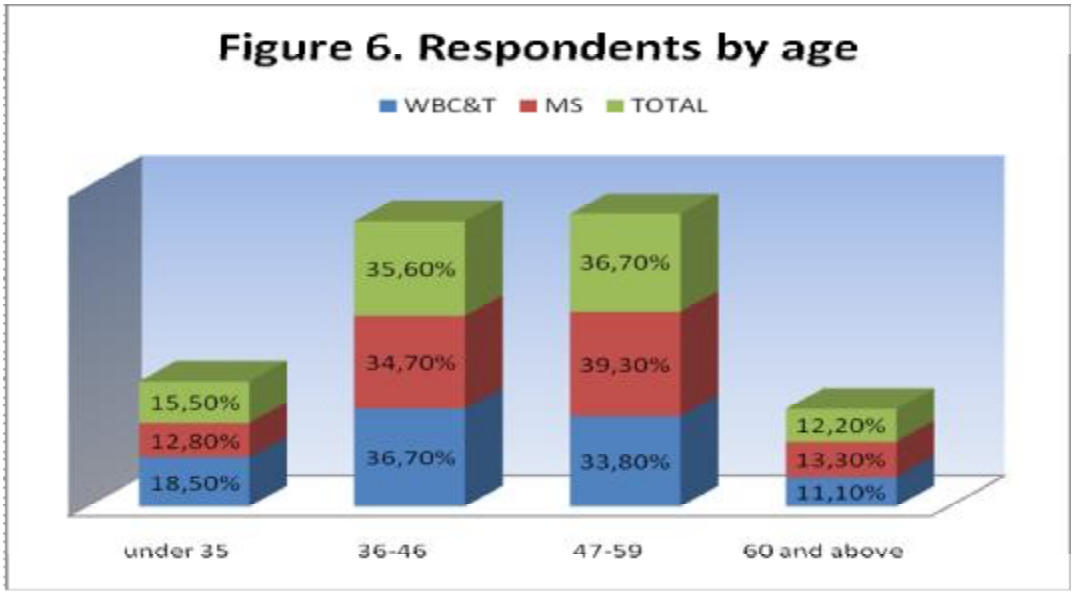
Table 2: Respondents by fields of science and gender

Crosstab

			gender		
			Female	Male	Total
Main research field	Natural sciences	Count	67	107	174
		% within Main research field	38,5%	61,5%	100,0%
		% within gender	22,9%	20,7%	21,5%
	Engineering and technology	Count	67	201	268
		% within Main research field	25,0%	75,0%	100,0%
		% within gender	22,9%	39,0%	33,1%
	Agriculture and forestry	Count	28	44	72
		% within Main research field	38,9%	61,1%	100,0%
		% within gender	9,6%	8,5%	8,9%
	Medicine and biomedicine	Count	43	67	110
		% within Main research field	39,1%	60,9%	100,0%
		% within gender	14,7%	13,0%	13,6%
	Social sciences and humanities	Count	70	66	136
		% within Main research field	51,5%	48,5%	100,0%
		% within gender	23,9%	12,8%	16,8%
	Others	Count	18	31	49
		% within Main research field	36,7%	63,3%	100,0%
		% within gender	6,1%	6,0%	6,1%
Total		Count	293	516	809
		% within Main research field	36,2%	63,8%	100,0%
		% within gender	100,0%	100,0%	100,0%

Majority of respondents in both group of countries are in the mature period of scientific production since about 35% percent are in the late forties and about 36% are in the late fifties. About 15% can be classified as “young researchers” under 35 and about 12% are over 60 (Figure 6).

Figure 6: Respondents by age



When gender of respondents observed within age groups, it is noticeable that females and males are approximately equally distributed if they are 35 or younger, while in all the other cases – older groups, males are clearly the dominant group.
Also, the older the respondents get – the number of females is lower and the one of males higher, or - so to say – women are much more present in younger groups of age than in the older ones (Table 3)

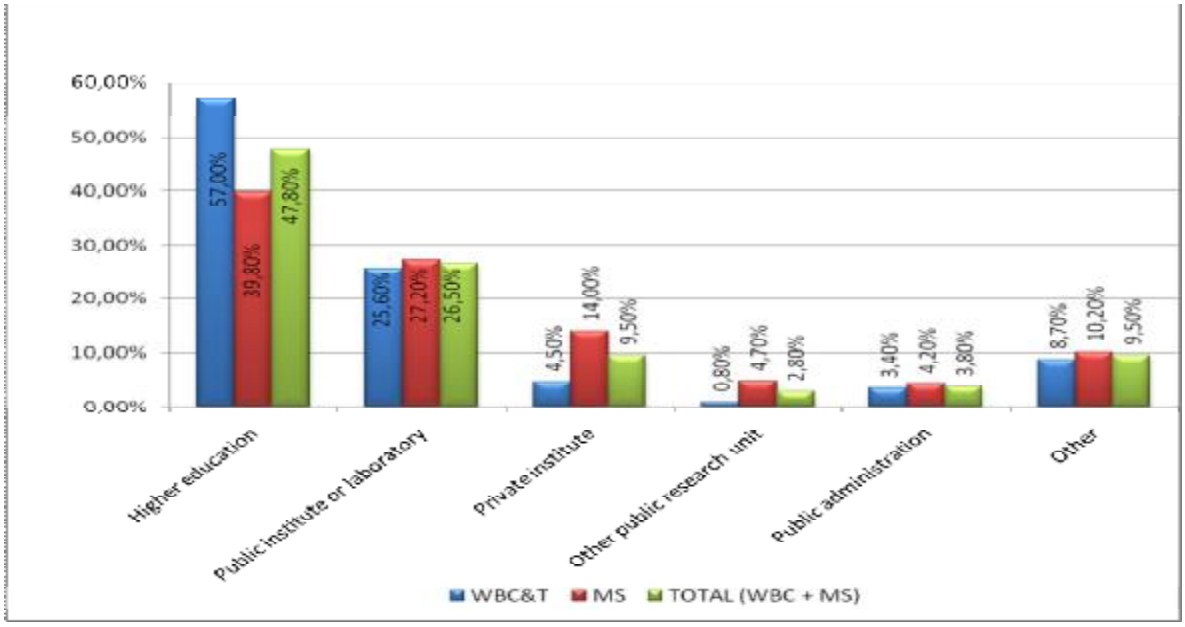
Table 3: Respondents by age and gender

Grouped by age and gender Cross tabulation

			gender		
			Female	Male	Total
Grouped by age	under 35	Count	62	63	125
		% within age groups	49,6%	50,4%	100,0%
		% within gender	21,2%	12,2%	15,5%
	36-46	Count	99	189	288
		% within age groups	34,4%	65,6%	100,0%
		% within gender	33,8%	36,6%	35,6%
	47-59	Count	99	198	297
		% within age groups	33,3%	66,7%	100,0%
		% within gender	33,8%	38,4%	36,7%
	60&over	Count	33	66	99
		% within age groups	33,3%	66,7%	100,0%
		% within gender	11,3%	12,8%	12,2%
Total		Count	293	516	809
		% within age groups	36,2%	63,8%	100,0%
		% within gender	100,0%	100,0%	100,0%

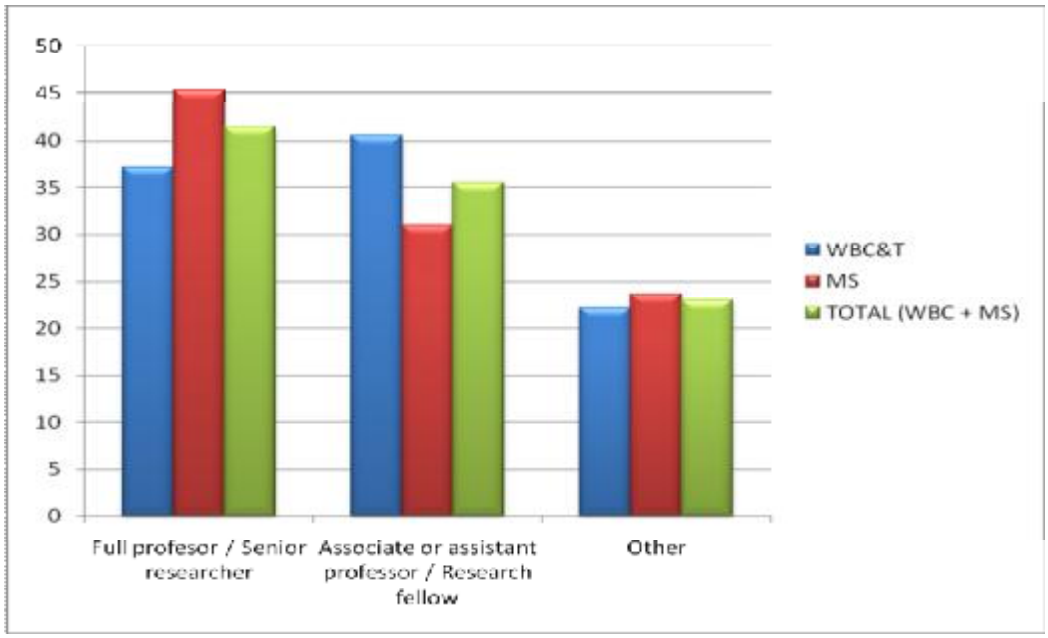
Majority of respondents are coming from university departments, 60% in WBC&T and 40% in MS. About a quarter of respondents in both group of countries are affiliated to public institutes and a small proportion of about 4% is coming from public administration. The remaining 10-12% belongs to other public research institutions, NGO, hospitals, advisory boards and similar institutions (Figure 7).

Figure 7: Respondents by type of institution



Majority of respondents from MS countries (45%) have the highest scientific positions of full professors or senior scientists while in the WBC&T the dominant group are respondents who are associate/assistant professors or research fellow (40%). A significant share of 20% of respondents is classified as "other" which includes positions such as: project managers, directors, head of departments/divisions, consultants, (free spirit), project officers, junior researchers, etc. (Figure 8).

Figure 8: Respondents by current employment positions

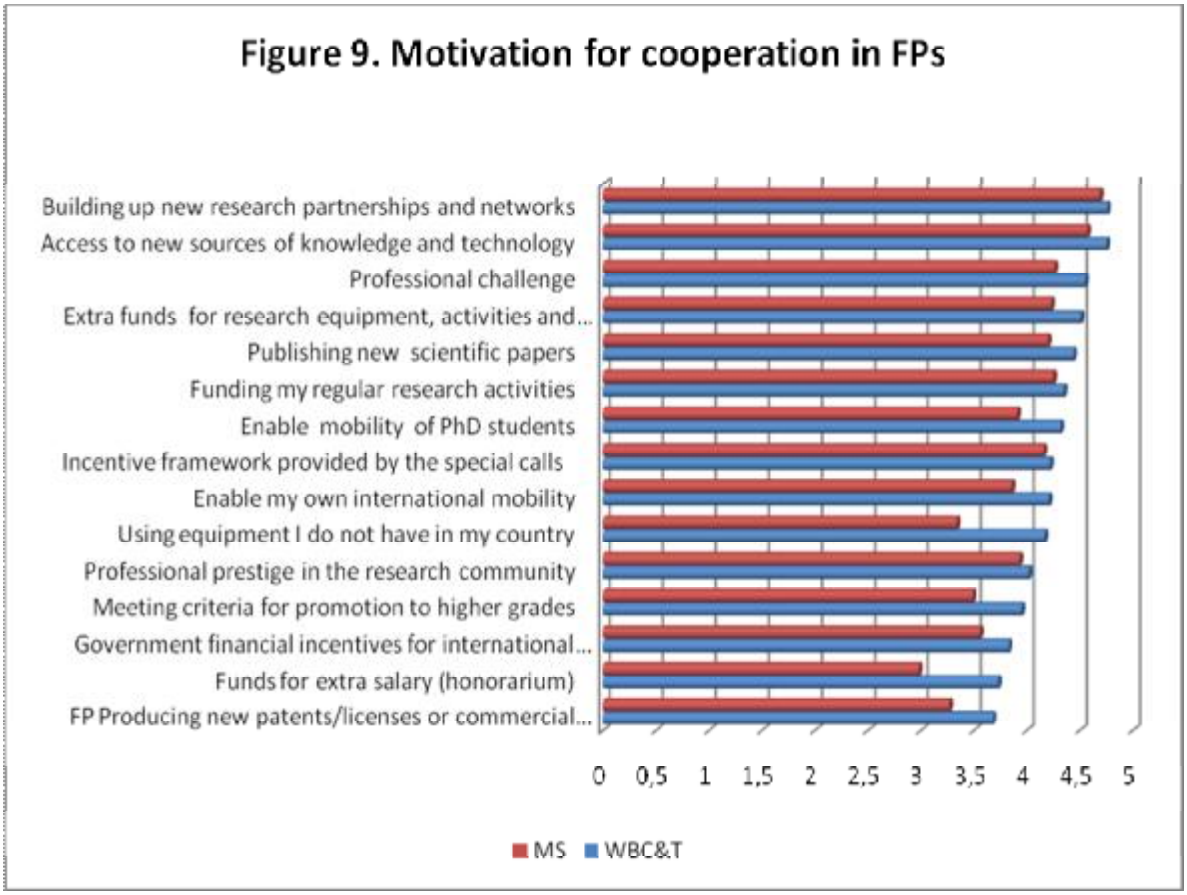


2.2 Motives for R&D cooperation

The analysis of motives for participation in FPs reveals that the **pattern** of motives (by the ranking order) in both groups of countries (WBC&T and MS) and in both types of cooperation (FP and bilateral projects with WBC&T) is very similar (Figure 9 and Figure 10). Almost all the motives in both groups of countries are ranked rather high (mean above 3.5) but the ranking in MS countries is slightly lower indicating that the motivation is slightly weaker in MS than in WBC countries. For example, respondents from WBC&T ranked 12 motives as very and quite important for participation in FPs, while for respondents from MS only 6 motives are of that importance.

The three most important motives are identical in both group of countries and both types of cooperation and include "science-driven" motives, as follows:

1. building up new research partnerships and networks;
2. access to new sources of knowledge and technology;
3. professional challenge.

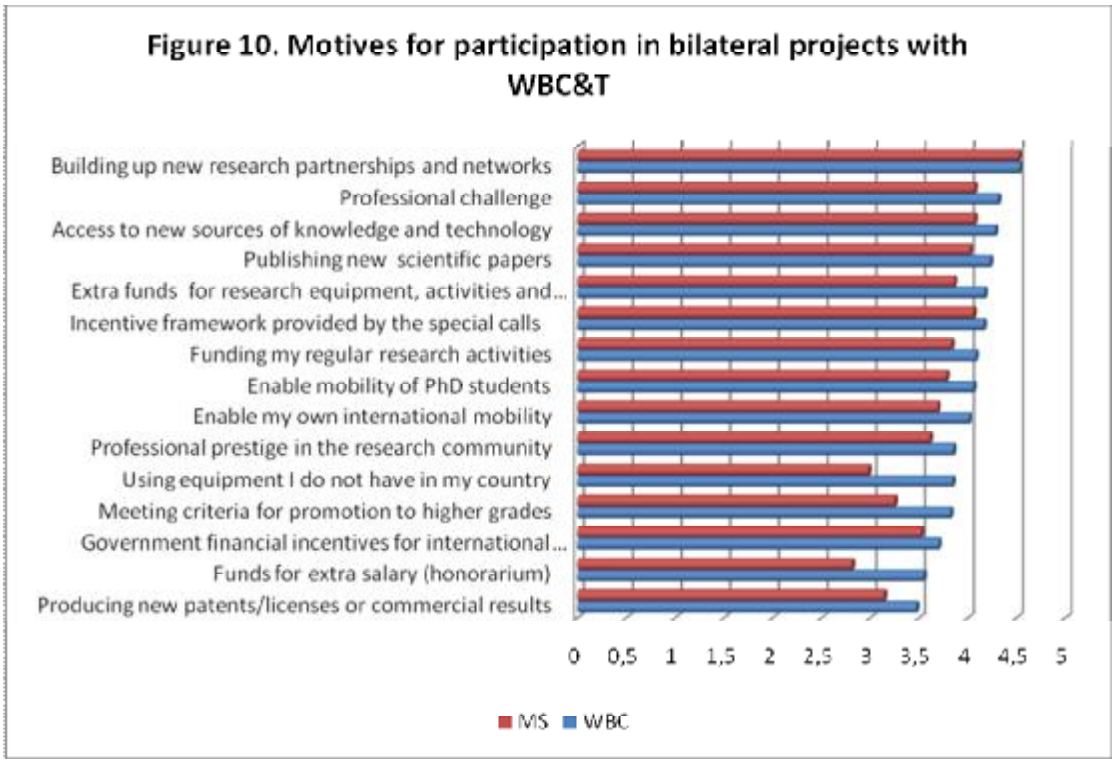


The next four motives for participation in FPs as well as in bilateral projects with WBC&T are related to the financial matters and publishing new scientific papers, as follows:

1. extra funds for research equipment, activities and travelling;
2. publishing new scientific papers;

3. funding my regular research activities;
4. incentive framework provided by the special calls (like INCO or bilateral R&D programmes).

Extra funds are more important for WBC&T while funding the regular research activities is more important for MS. It could probably indicate that researchers from WBC&T are highly dependent on national budget resources and understand international projects like on-top funding. In contrast, researchers from MS try to diversify resources of funding and treat all the funds on equal footing. This is, very probably, the reason why the incentive framework provided by the special calls (like INCO or bilateral programmes) is ranked as more important by MS than by WBC&T. The incentives provided within the bilateral programme framework and special calls play a significant role for involvement of MS in both bilateral projects and FP projects with WBC&T. In contrast to the incentives provided by the special calls/bilateral programmes, the financial support provided by the national governments is among the least important motives, especially within WBC&T. It could indicate that financial stimulation provided by the national government for participation in FPs is rather weak, calling for the additional resources to stimulate R&D cooperation.



It is interesting that "professional prestige" and "meeting criteria for personal scientific career" are not perceived as very important motives for participation neither in FPs nor in bilateral projects with WBC&T (means are below 4). It could indicate that evaluation criteria for researchers' promotion into the higher scientific grades within the national science polices do not recognise participation in international projects as an important element of researchers' activities. It seems that international projects are taken into account, indirectly, by the number of scientific papers, studies, participation in conferences, etc. Mobility or researches and PhD students are also not perceived as very important motives for participation in the collaborative projects.

"Using equipment I do not have in my country" is in the middle of the ranking scale for WBC&T and on the bottom of the scale for MS. Finally, the least important motives for cooperation are funds for extra salaries (honorariums) and producing new patents/licenses or commercial results in both groups of counters.

Although the rankings of motives seem to be similar in WBC&T and MS we have tested statistically significant differences in motives between the two groups of countries by t-test[7]. The t-test indicates that there is a significant difference in perception of the importance of almost all the motives for participation in both EU FPs (Annex, Table 2) and bilateral projects with WBC&T (Annex, Table 3).

The most significant differences between WBC&T and MS in both types of cooperation (EU FPs and bilateral projects with WBC&T) involve the three motives presented in the Table 4. The t-test indicates that availability of research equipment through international cooperative projects is a much more important motive for WBC&T than for MS and confirms that WBC&T suffers the lack of research infrastructure. Similarly, using the international projects as a financial source for extra salaries (honorariums) is also much stronger motivator in WBC&T (although this motive is on the bottom of the ranking list of motives). Finally, international cooperation is much more important for personal promotion to higher scientific grades in WBC&T than in MS countries.

Table 4: Significant differences in motives for international cooperation between WBC&T and MS (measured by t-test for equality of means)

	EU FPs		Bilateral projects with WBC&T	
	Sig (2-tailed)	Mean difference	Sig (2-tailed)	Mean difference
1. Using "equipment I do not have in my country	.000	.828	.000	.859
2. Funds for extra salary (honorarium)	.000	.749	.000	.742
3. Meeting criteria for my personal scientific carrier (promotion to higher grades)	.000	.456	.000	.579

2.3. Types of cooperation

The research is focused on the analysis of the two basic types of R&D cooperation: projects funded by the EC within Framework programmes (FPs) and bilateral projects with either WBC&T or MS.

The largest amount of projects consists of the projects funded by the EU FPs – 71% of the total projects, out of which 35% are performed by WBC&T and 65% by MS. The next most represented type of projects is bilateral projects with MS (20% of total

[7] The t-test assesses whether the means of two groups are statistically different from each other.

projects) out of which 55% are performed by WBC&T and 45% by MS. The least represented type of projects is bilateral projects with WBC&T (9% of total projects) out of which 37% is performed by WBC&T and 63% by MS (Table 5).

The **dominant type of cooperation** in both groups of countries are FP projects, 64% of all projects within WBC&T, and 76% of all projects within MS. Respondents from MS reported higher number of bilateral projects with WBC&T than respondent from WBC&T and vice versa respondents from WBC reported higher number of bilateral projects with MS than with WBC&T. It means that bilateral cooperation between the group of countries is more intensive within each of the group.

Table 5: Projects by type of R&D cooperation

	TOTAL		WBC&T		MS	
Projects funded by the FPs	504	100%	178	35%	326	65%
		71%		64%		76%
Bilateral projects with WBC&T	62	100%	23	37%	39	63%
		9%		8%		9%
Bilateral projects with MS	137	100%	75	55%	62	45%
		20%		27%		14%
TOTAL	703	100%	276	39%	427	61%
				≈100%		≈100%

The most intensive bilateral cooperation of WBC&T and MS is with Slovenia (39 projects), Austria (15 projects), Italy (4 projects) and France (9 projects) (Annex, Table 4) while the most intensive intra-regional bilateral cooperation among WBC&T is with Croatia, Serbia and Turkey (Table 6)

Table 6: Number of bilateral projects among WBC&T

	Croatia	FYR of Macedonia	Montenegro	Serbia	Kosovo/UNMIK	Bosnia and Herzegovina	Turkey	TOTAL
Albania	1	2	1	1	1	1	1	
Croatia		1		1		1		
FYR of Macedonia	4		1	2		1	4	
Montenegro	2	1		1		1	1	
Serbia	2					1		
Bosnia and Herzegovina	2			3				
Turkey								
TOTAL	**11**	**4**	**2**	**8**	**1**	**5**	**6**	**37**

2.4 Intensity of cooperation

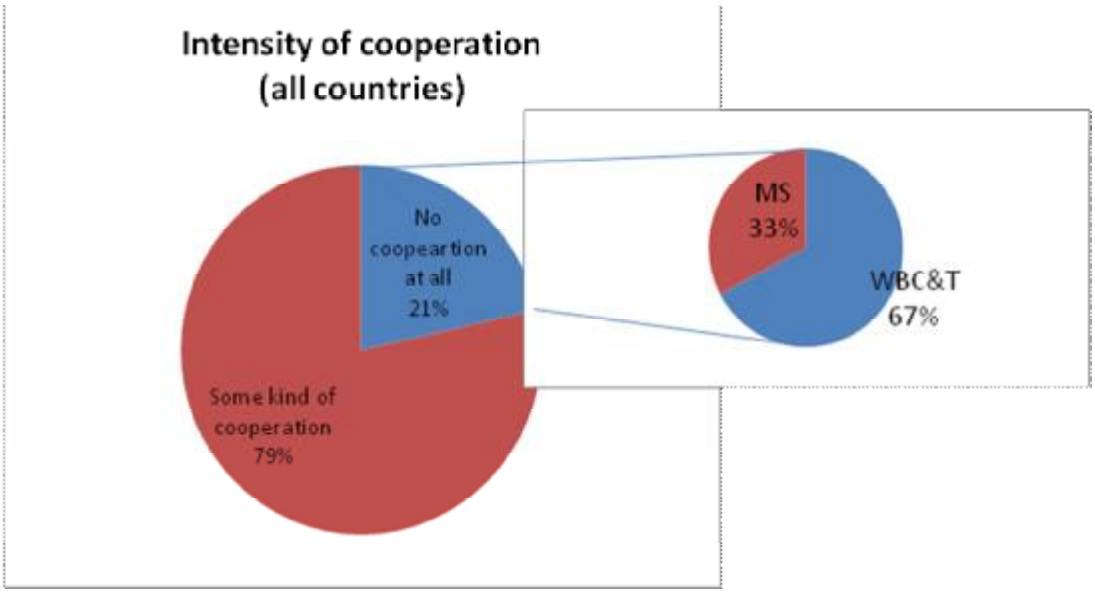
Intensity of cooperation was measured as a composite index compiled of the seven cumulative components:

- Component 1. Participation in international research projects in the last ten
- years (question 8);
- Component 2. At least one visit or stay abroad for scientific purposes in the last 10 years (question 10)
- Component 3. Participation in conferences (question 10.1)
- Component 4. Participation in research fellowship (question 10.2)
- Component 5. Participation in scholarship (question 10.3)
- Component 6. Participation in visiting professors (question 10.4.)
- Component 7. Participation in temporary employment (question 10.5).

The range of *intensity of cooperation index* is from zero to seven, where zero shows no cooperation at all, while and seven shows the maximum cooperation, all components mentioned above.

Out of the total respondents from the both groups of countries (WBC&T and MS) 21.5% do not have any kind of cooperation, i.e. they have not answered positively to any of the seven components. Out of those 21.5% without cooperation, 67.2% are from WBC&T while 32.8% are from MS (Figure 11).

Figure 11: Intensity of cooperation



The most frequent range of intensity of mobility is 3 and 4 in both groups of countries. The Chi-Square[8] indicates that there is a statistically significant difference between these two groups of countries revealing that intensity is much more present

[8] The Chi-Square tests the statistically significant differences between two (or more) independent groups. Chi square tests can only be used on actual numbers and not on percentages, proportions, means, etc.

among MS. For example, within MS 63% of respondents have the score of intensity either 3 or 4 (33,0% - score 3 plus 30% - score 4) while within WBC&T only 47.6% have the scores of 3 and 4 (Annex, Table 5).

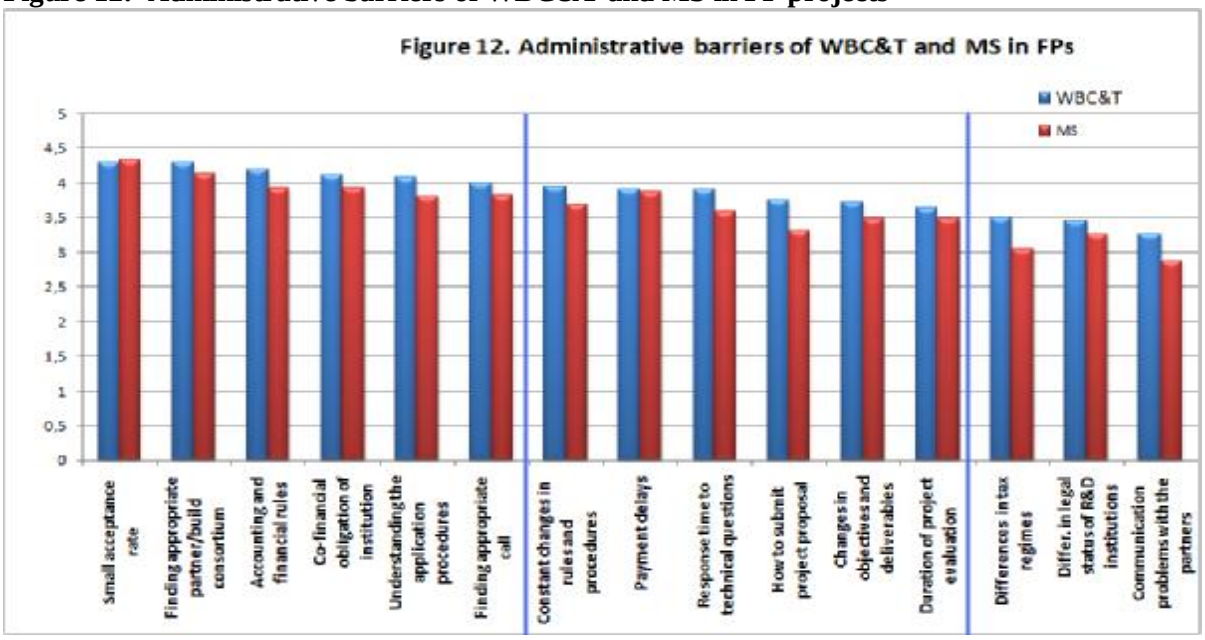
If we take a look at only one component of research intensity - Participation in international research projects in the last ten years (component 1, question 8)- we can see that 14% of respondents from MS and 31% from WBC&T have not participated in the international collaborative research projects in the last 10 years. Since ten years is a quite a long time span for being absent from international cooperation, more attention should be given to this problem. However, the lack of cooperation, as the next sub-chapter reveals, is more correlated with private and public institutes/labs and government organisations than with universities.
The components from 2 to 7 are presented also separately in the Chapter 2.7 on mobility of researchers.

2.5. Descriptive analysis of barriers

2.5.1 Administrative and bureaucratic barriers

The most important barriers for both groups of countries and in both types of cooperation (FP and bilateral projects with WBC&T) are barriers which are classified as administrative and bureaucratic barriers. The ranking of barriers are almost the same in both groups of countries suggesting that the **pattern** of administrative barriers between WBC&T and MS is very similar. However, the ranking of all barriers in MS countries is slightly lower indicating that these barriers are slightly weaker in MS than in WBC countries (Figure 12 and Figure 13). The exception is the most important barrier for both groups of countries denoted as "a small acceptance rate of project proposals in relation to the large efforts invested in project preparation". This barrier is a little bit more important among MS very probably due to the fact that MS countries apply for FP projects more frequently than WBC.

Figure 12: Administrative barriers of WBC&T and MS in FP projects



All the 15 types of barriers can be classified in the three groups according the ranking values of means (Table 7). The results suggest that the most important barriers for both WBC&T and MS in both types of cooperation are the following three barriers:
1. small acceptance rate in relation to invested efforts;
2. finding appropriate partner/build consortium;
3. co-financial obligation of institution.

There are three additional barriers estimated as very and quite important which are specific only for FPs for both WBC&T and MS:

1. accounting and financial rules;
2. understanding the application procedures;
3. finding appropriate call.

Table 7: The importance of the administrative barriers for WBC&T and MS by the value of means

	Administrative barriers common for both WBC&T and MS in EU FP	Administrative barriers common for both WBC&T and MS in bilateral projects with WBC
Very/Quite important Mean (4 and above)	**1. Small acceptance rate in relation to invested efforts** **2. Finding appropriate partner/build consortium** **3. Accounting and financial rules** 4. Co-financial obligation of institution 5. Understanding the application procedures 6. Finding appropriate call	**1. Finding appropriate partner/build consortium** **2. Small acceptance rate in relation to invested efforts** **3. Co-financial obligation of institution**
Medium importance (mean 3.5-4.0)	7. Constant changes in rules and procedures of project submission and monitoring 8. Payment delays 9. Response time to technical questions 10. Technical knowledge on how to submit project proposal (e.g. on line) 11. Changes in project objectives and deliverables 12. Duration of project evaluation	4. Finding appropriate call 5. Understanding the application procedures 6. Payment delays 7. Accounting and financial rules 8. Response time to technical questions 9. Constant changes in rules and procedures 10. Technical knowledge on how to submit project proposal 11. Changes in project objectives and deliverables 12. Duration of project evaluation
Low importance Mean below 3.5)	13. Differences in tax regimes 14. Differences in legal status of R&D institutions 15. Communication problems with the partners	13. Differences in tax regimes 14. Differences in legal status of R&D institutions 15. Communication problems with the partners

Apart from the six most important barriers for all the countries in average, the analysis of the barriers by each of the WBC&T country (Table 8) reveals that "finding appropriate partners and building consortium" is perceived as the biggest problem by the four countries: Albania, FYR of Macedonia, Serbia, and Kosovo/UNMIK[9]. Accounting and financial rules are perceived as the biggest problem by two countries – Montenegro and Turkey, while financial obligation are perceived as the biggest problem by researchers in Bosnia and Herzegovina. Finally, the "small acceptance rate in comparison to invested efforts" is perceived as the biggest problem by researchers in Croatia.

Table 8: Perception of administrative barriers in WBC&T

	Albania	Croatia	FYR of Macedonia	Montenegro	Serbia	Kosovo/ UNMIK[8]	Bosnia and Herzegovina	Turkey	Total
Finding out appropriate call or framework for cooperation	4,41	3,84	3,93	4,12	4,05	**4,75**	4,07	4,06	4
Finding out appropriate partner / building consortium	**4,59**	4,15	**4,36**	4,18	**4,36**	**4,75**	4,39	4,31	**4,3**
Understanding the application procedures	3,91	3,98	4,27	4,12	4,04	5	4,18	4,17	4,1
Technical knowledge on how to submit project proposal	3,77	3,69	3,69	3,88	3,78	**4,75**	3,54	3,94	3,8
Too big invested efforts in project preparation compared to small acceptance rate	4,23	**4,29**	4,23	4,41	4,3	4,25	**4,43**	4,38	**4,3**
Accounting and financial rules	4	4,03	4,14	**4,47**	4,3	3,75	4,35	**4,43**	4,2
Differences in tax regimes	3,14	3,22	3,67	3,5	3,58	3,75	3,96	3,79	3,5
Differences in legal status of R&D institutions	3,27	3,21	3,55	3,82	3,48	3,5	3,54	3,85	3,5
Constant changes in rules and procedures of project submission and monitoring	3,62	4,01	4,02	3,76	3,91	4	3,96	3,94	3,9
Payment delays by funding organisation	3,85	3,77	4,05	3,94	3,89	3,5	4,3	4,03	3,9
Co-financial obligation of my institution	4,2	4	4,02	4,18	4,19	4,5	4,5	3,94	4,1
Changes in project objectives, deliverables,	3,45	3,52	3,91	3,69	3,78	3,5	3,93	4,15	3,7

[9] The results for Kosovo should be taken by a precaution since there are only four respondents from Kosovo

budget or partners									
Duration of project evaluation	3,36	3,59	3,62	3,44	3,7	3,25	3,71	3,94	3,6
Time to response to various technical questions from EU or national administration	3,71	3,9	4	4	3,84	3,5	4,11	3,97	3,9
Communication problems with the partners	3,45	3,03	3,18	3,29	3,25	3,25	3,43	3,94	3,3

Although the ranking of administrative barriers is similar in both WBC&T and MS, the t-test for equality of means (Annex, Table 6) indicates that there is a significant difference in the perception of importance of the administrative barriers of WBC&T and MS. The eight barriers presented in the Table 9, are much more emphasised in the WBC&T which confirms the hypothesis that **there is a significant difference in the perception of barriers between WBC and MS**. However, these barriers are not highly ranked and include barriers such as: the differences in legal status of R&D institutions, differences in tax regimes and technical knowledge on how to submit project proposal. On the other hand, **the three most important barriers are common for both WBC&T and MS.**

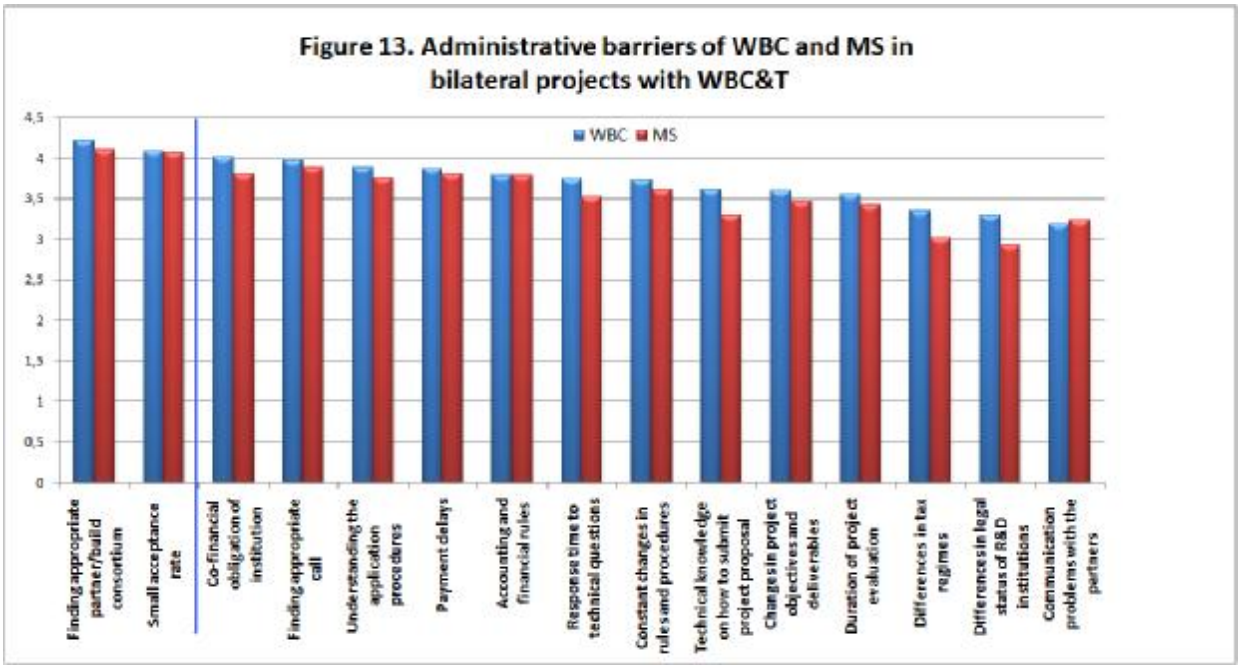
Table 9: Significant differences in perception of administrative barriers between WBC&T and MS (measured by t-test for equality of means)

	Sig (2-tailed)	Mean difference
1. Differences in legal status of R&D institutions	**.000**	.564
2. Differences in tax regimes	**.000**	.459
3. Technical knowledge on how to submit project proposal (e.g. on line)	**.000**	.438
4. Response time to technical questions from EC administration	**.000**	.316
5. Accounting and financial rules	**.000**	.267
6. Understanding the application procedures	**.002**	264
7. Changes in project objectives, deliverables, budget and partners	**.002**	.249
8. Constant changes in rules and procedures of project submission and monitoring	**.003**	.249

Very similar results are received for barriers in bilateral cooperation with WBC&T Figure 13). This finding is rather strange since participation in bilateral projects is much simpler from the technical, administrative and bureaucratic point of view. Usually, bilateral projects are easy for setting up, absorb low management efforts and costs and involve only few risks. There are at least two possible explanations for that: first, researchers indeed do not perceive significant difference in these two types of

projects or, second, they were answering mechanically following their answers previously given for FP projects.

Figure 13: Administrative barriers of WBC&T and MS in bilateral projects with WBC&T



2.5.2. Institutional capacity barriers on the national level

The next most important barriers for both groups of countries are barriers commonly named "institutional capacities on the national level". Similar to administrative barriers the **pattern** of institutional barriers at the national level for both groups of countries, WBC&T and MS, and for both types of R&D cooperation is very similar since the barriers are ranked in an almost identical order (Figure 14). Also, similarly to administrative barriers all the ranking values are lower in MS countries indicating that these barriers are weaker in MS than in WBC&T.

In both groups of countries the most important barrier is **the lack of a country's lobbying skills** at the level of EU administration (or other national governments in case of WBC projects) (Figure 15). It illustrates that researchers are convinced that negotiation process, very probably related to the general scientific image related to techno-economic power of a country, regardless its "geopolitical" categorisation (WBC or MS) is quite an important factor for awarding a project.

In addition to lobbing skills, the next very important barriers (the value of means above 3) are:

- lack of industrial partners;
- low scientific image of a country;

- difficulties in mobility of researchers;
- parochialism or a low national openness to the international collaboration.

Figure 14: Institutional barriers at the national level for participation in FP

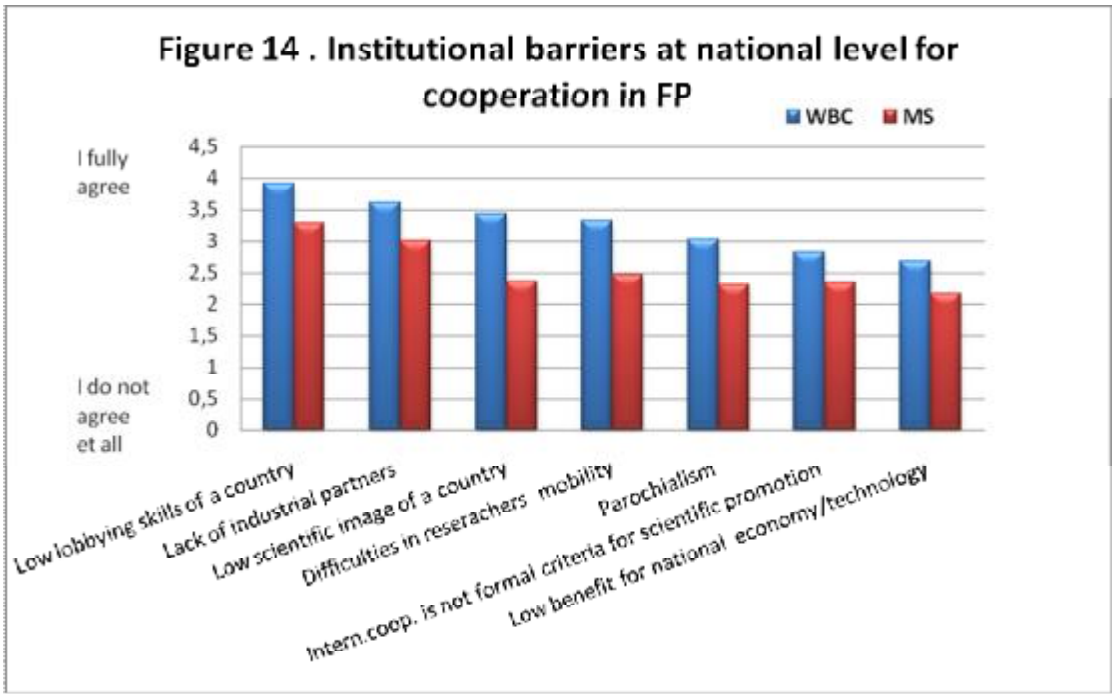
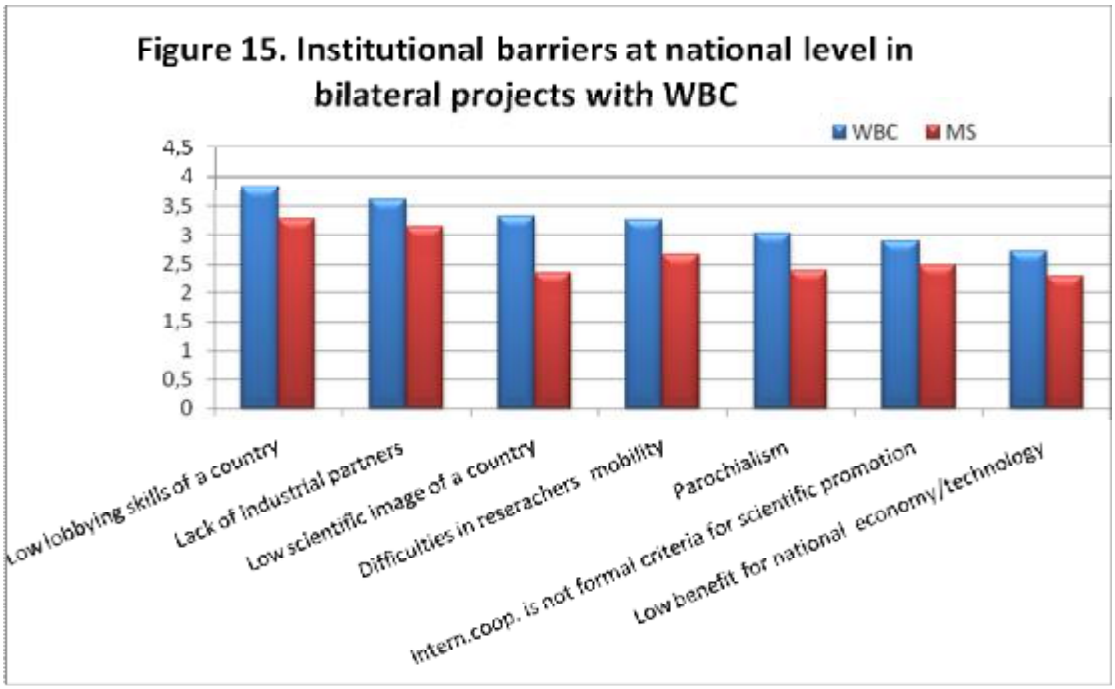


Figure 15: Institutional barriers at the national level for participation in the bilateral projects with WBC&T



Although there is no difference in the pattern of the national institutional capacities (as there were no for administrative barriers), the t-test for equality of means (Annex, Table 7) indicates that there is a **significant difference in importance of the entire set of the national institutional barrier by WBC&T and MS**. Among them, the following three barriers are much more emphasised in the WBC&T than in MS: scientific image of the country, difficulties in mobility of researchers and parochialism – low national openness to international collaboration (Table 10). It illustrates that socio-cultural categories like scientific image or parochialism are important barriers for WBC&T for their participation in both FP and bilateral projects with WBC.

Table 10: Significant differences in perception of institutional barriers of research organisation between WBC&T and MS (measured by t-test for equality of means)

	Sig (2-tailed)	Mean difference
1. My country has low overall international reputation and scientific image	**.000**	1.073
2. There are difficulties with researcher's mobility exchange (legal rules and procedures)	**.000**	.855
3. We are suffering from parochialism - low national openness to the international collaboration	**.000**	.724

These socio-cultural barriers are most pronounced in Bosnia and Herzegovina and Montenegro (Table 11) while in other WBC&T the highest rank is assigned to the "lobbing skills")

Table 11: Perception of institutional barriers at national level in WBC&T for participation in FP

Country of permanent residence	Internat. cooper. is not a formal criteria for scientific promotion	We are lacking industrial partners and companies for research cooperation	National economy and technology do not benefit from international cooperation	There are difficulties with researchers' mobility exchange	Lobbying skills of my country are rather low	My country has low overall international reputation and scientific image	We are suffering from parochialism
Albania	2,32	3,23	2,36	3,45	**3,68**	3,59	2,86
Croatia	3,14	3,68	2,75	3,16	**3,95**	3,27	3,1
FYR of Macedonia	2,89	3,71	3,02	3,27	**4,09**	3,64	3,31
Montenegro	2,18	3,47	2,35	3,24	**3,59**	**3,59**	2,53
Serbia	2,61	3,69	2,6	3,5	**3,93**	3,37	2,96
Kosovo / UNMIK	3	**4,25**	1,75	3,75	3,75	3,75	2,25
Bosnia and Herzegovina	3,66	3,83	2,9	3,55	4,14	**4,28**	3,55
Turkey	2,36	3,22	2,58	3,14	**3,58**	3,08	2,64
Total	2,83	3,62	2,69	3,32	**3,91**	3,44	3,03

The barrier designated as a "lack of benefit for national economy and technological development" is not perceived as an institutional barrier in any group of countries. This might mean that the lack of benefit for the economy is not considered an institutional barrier and can be noted as an interesting finding that needs further investigation.
The "recognition of international cooperation" as a formal criterion for scientific promotion of individual scientist is more important in Albania, FYR Macedonia, Serbia and Turkey than in other WBC countries.

2.5.3. Institutional capacity barriers on the level of research institution

As we previously defined the institutional capacity barriers at the level of research institution are related to the capacity of each researcher's institution to provide professional support and assistance to researchers for participation in international projects. The lack of these capacities could seriously influence the intensity and quality of international R&D cooperation or could, on contrary, advance it. We have expected that perception of these barriers will be of the most importance to the researchers because the implementation of the general national policy for international R&D cooperation should be implemented on the specific level of institution in the way that facilitates and supports the efforts of each researcher to participate in the international R&D cooperation.

However, the analysis revealed that the entire set of these barriers are perceived as not important barriers for cooperation in both groups of countries. It means that respondents are rather satisfied with the capacities of their institutions to provide them with the support for international cooperation[10]. Besides, respondents from MS are satisfied with all the given elements of institutional capacities since they ranked all of the given barriers as "not very important" (mean below 3, from 2.0 to 2.9). WBC&T evaluate six barriers as not very important (mean form 2.5 to 3.0) (Table 13) and only four barriers as "medium important" (Table 12).

Table 12: Institutional capacity barriers at the level of research organisation evaluated by WBC&T as medium important and by MS as not important

	Mean WBC&T	Mean MS
1. Occupation with other priorities	**3,28**	**2,9**
2. Lack of skilled accounting professionals	**3,26**	**2,5**
3. Lack of assistance in project managing	**3,24**	**2,7**
4. Lack of adequate research equipment	**3,16**	**2,1**

5-fully agree; 3- cannot decide; 1- not agree at all)

[10] The ranking of these barriers are measured by the level of agreement with a set of statements related to the institutional incapacities like a lack of accounting professional, assistance in project management, etc.

Again, the **pattern** of the institutional capacity barriers at the level of research institution is very similar between WBC&T and MS and for the both type of R&D cooperation. The exception is research equipment which is identified in WBC&T as much significant barrier than in MS.

Table 13: Capacity barriers at the level of research organisation evaluated by the both WBC&T and MS as not very important

	Mean WBC&T	Mean MS
5. Lack of advisory support	2,89	2,49
6. Passivity of leadership	2,79	2,38
7. Low financial gain for research team	2,72	2,46
8. Lack of competent collaborators	2,72	2,2
9. Low financial gain for institution	2,71	2,45
10. Low ICT capacities	2,6	2,06
11. R&D cooperation is not of strategic interest	1,8	1,6

5-fully agree; 3- cannot decide; 1- not agree at all)

The most important barrier for both groups of countries, but not the decisive one (still ranked about medium importance), is occupation with other priorities within institution such as teaching activities, which are taking scientists away from international cooperation. The next most important barriers are the lack of accounting professionals, assistance in project management and non-adequate research equipment. These barriers tend to be important barriers in WBC&T and not important in MS.

The t-test for equality of means (Annex, Table 8) indicates that there is a significant difference in perception of all the barriers in WBC&T and MS indicating that these barriers are much more present in WBC&T than in MS. The problems which are emphasised in WBC&T much more than in MS are related to: adequate research equipment, accounting professionals, ICT capacities, competent collaborators and professional/advisory support (Table 14).

Table 14: Significant differences in perception of institutional barriers of research organisation between WBC&T and MS (measured by t-test for equality of means)

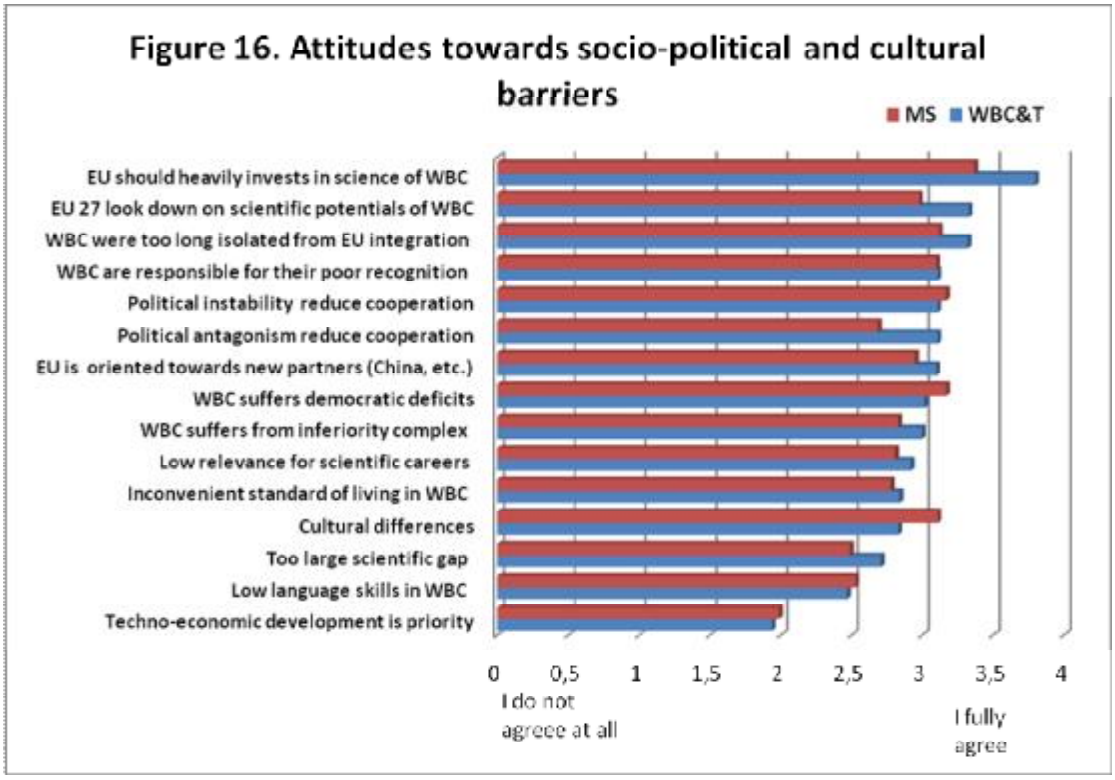
	Sig (2-tailed)	Mean difference
1. Lack of adequate research equipment	.000	.973
2. Lack of skilled accounting professionals for FP or bilateral projects	.000	.757
3. Low information and communication technology (ICT) capacities	.000	.552
4. Lack of competent collaborators at institution	.000	.523
5. Lack of adequate professional and advisory support to international cooperation	.000	.493

Both groups of countries estimate that international R&D cooperation is of strategic interest to their organisations. The majority of them cannot decide whether their leadership is sufficiently engaged in finding appropriate call, scientific partners or research niches or not. However, they are more inclined (especially in MS) to believe that leadership is sufficiently active in this respect. Respondents also estimate that they receive satisfactory level of advisory and professional support in general for international cooperation. It is important to notice that respondents estimated that financial gain from FPs and bilateral projects for them, their research teams and institutions is not negligible. In other words, it could be stated that they are satisfied with the project grants. This conclusion is congruent with the high ranking of the funds for regular research activities and extra funds for research equipment, activities and travelling as motives of cooperation.

2.5.4 Political and socio-cultural barriers

The analysis of political and socio-cultural aspects of research cooperation in general (regardless the type of projects) revels that attitudes of respondents from both groups of countries towards factors such as political antagonism, cultural differences, inferiority/superiority complex etc. are rather neutral or "politically correct". The means of the attitudes oscillates about the medium value of 3 or lower (Figure 16) indicating that respondents either do not agree with the statement or they choose the "cannot decide" option to avoid assertions which imply "political and socio-cultural segregation" between WBC&T and MS.

Figure 16: Attitudes towards political and socio-cultural barriers



The highest score of agreement by both groups of countries is assigned to such a politically correct and essentially plausible statement that EU should heavily invest in science of WBC&T to overcome their lagging behind. This finding confirms the fact that science in WBC&T is currently underinvested. At the first glance, it seems that both groups (WBC&T and MS) share the common opinion that scientific development of WBC&T is not the responsibility of WBC&T alone, but of the entire EU. However, the t-test of differences between means (Table 15) reveals that there is statically significant difference in the scores of this attitude between respondents from WBC&T and MS. It indicates that WBC&T expect much more investments from EU than MS.

In addition to investments in R&D, respondents from WBC&T countries tend to rank another eight out of 15 socio-political barriers as important, while respondents from MS have found only three (Table 15). This indicates that MS does not consider socio-cultural and political barriers such important for R&D cooperation as WBC&T.

The eight barriers selected by respondents from WBC&T reveal that respondents from WBC&T are of the opinion that their poor R&D international cooperation is mainly due to **their own faults while behaviour of the EU partners contribute to a lesser degree.** Among EU failures they underline the EU image of scientific superiority expressed in the attitude that "EU looks down on scientists from WBC&T". WBC&T also tend to think that previous or current isolation of WBC&T from EU integration processes is one of the main reasons for the current limited scientific potentials. They also believe that scientific interests of the „old" MS (EU15) are oriented towards new scientific partners like Japan, India or China which certainly diminish EU interest for WBC&T.

Table 15: Perception of the importance of the political and socio-cultural barriers

ABOUT MEDIUM IMPORTANCE	WBC&T	MS
EU should heavily invests in science of WBC to overcome their lagging behind EU	**3,8**	**3,37**
EU 27 look down on scientific potentials of WBC	**3,33**	2,98
Scientific potentials of WBC stem from previous or current isolation of WBC from EU integration processes	**3,32**	**3,12**
Political antagonism within WBC reduce research cooperation among WBC	**3,11**	3,1
Political instability in the region hinder cooperation with WBC	**3,11**	**3,17**
WBC are responsible themselves for their poor recognition on international „research map"	**3,11**	2,69
Scientific interests of the „old" MS (EU15) are oriented towards new scientific partners like Japan, India or China	**3,1**	2,95
Democratic deficits of some WBC diminish research cooperation	**3,02**	**3,17**
WBC suffers from inferiority complex and feel helplessness and dependency on more advanced EU countries	**3**	2,83

LOW IMPORTANCE		
Cooperation with WBC is of low relevance for scientific careers of individual scientists	2,92	2,81
Standard of living in WBC is inconvenient for foreign researchers	2,84	2,78
There are cultural differences between "western countries" and WBC	2,83	**3,11**
Scientific gap between EU countries and WBC is too large to overcome in next decade	2,71	2,49
Language skills in WBC prevents research cooperation between WBC and EU countries	2,47	2,53
WBC should concentrate primarily on economic development and political stability while scientific research should come afterwards	1,94	1,99

Among their own failures they include mutual political antagonism, overall political instability in the region and democratic deficits which diminish R&D cooperation. Moreover, the important obstacle is their inferiority complex in relation to the advanced EU countries. As a consequence, they estimate that they are alone responsible for their low position in international research map.

This indicates that respondents from MS are not burdened with the socio-cultural and political differences and do not perceive them as important barriers for research. Nevertheless respondents from WBC&T are inclined to look for "excuses" for their inferior position in ERA in these external socio-cultural and political factors.

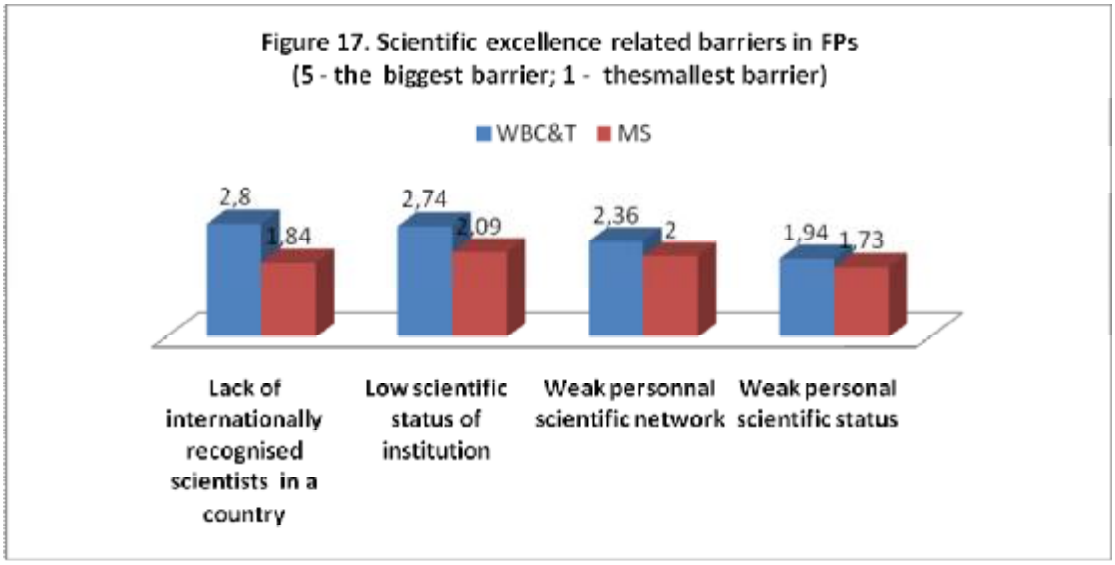
The t-test for equality of means reveals that there are four statements which are statistically different for WBC&T and MS (Table 16). Generally speaking, respondents from MS follow the same pattern in the attitudes of respondents from WBC&T except one statement. Contrary to WBC&T they emphasise that cultural differences between "western" countries and WBC might hinder cooperation. We can suppose that cultural differences in this case refer to different value ordinations which are not measured by our survey. WBC&T share the same value ordination such as egalitarianism, statism, paternalism and the lack of trust in institutions which is quite different from dominant value orientations in the Western Europe.

Table 16: Significant differences in perception of political and socio-cultural barriers between WBC&T and MS (measured by t-test for equality of means)

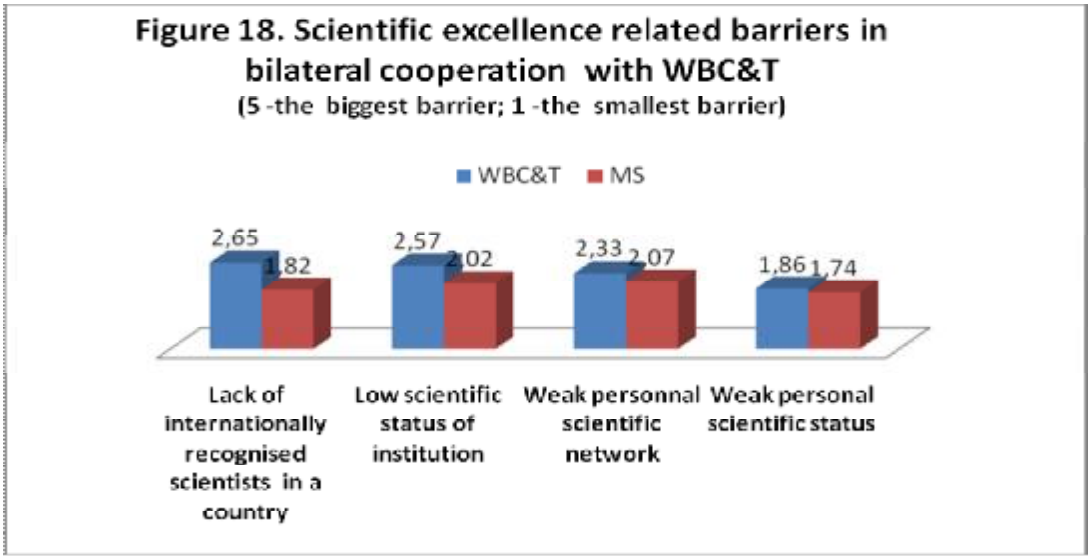
	Sig (2-tailed)	Mean difference
1. EU should heavily invests in science of WBC to overcome their lagging behind EU	**.000**	.435
2. WBC are responsible themselves for their poor recognition on international „research map"	**.000**	.418
3. EU 27 look down on scientific potentials of WBC	**.000**	.356
4. There are cultural differences between "western - -countries" and WBC	**.000**	-.285

2.5.5 Barriers of scientific excellence

The barriers connected to the perception of scientific excellence at individual, organisational and national level also do not play a significant role in international cooperation[11]. All of the four given barriers in the both groups of countries, and in the both type of cooperation are ranked as "not important" or as "not important at all" (value of means below 3) (Figure 17 and Figure 18).



Respondents are mostly satisfied with their personal scientific status and international connections (networking). Putting it another way, they are convinced that their scientific competences and connections are sufficient for participation in international projects. They are a little bit less satisfied with the competitive status of their institutions at the international "research maps" while they are at least satisfied with the amount of the internationally recognised scientists in the country. However, they do not agree with the statement that their countries suffer from the lack of prominent scientists.



[11] The ranking of these barriers are measured by the level of agreement with a set of statements related to the insufficient level of scientific excellence

However, there is a significant difference (t-test) (Annex, Table 9) between WBC&T and MS in all barriers meaning that scientific excellence barriers are much more pronounced in WBC&T than in MS. The largest difference is in the amount of internationally recognised scientists and in the low competitive status of the researches institution in international research arena (Table 17).

Table 17. Scientific excellence barriers specific for WBC for the participation in FP (measured by t-test for equality of means)

	Sig (2-tailed)	Mean difference
1. Lack of internationally recognized scientists	.000	.968
2. Low competitive scientific status of the institution at the international "research map"	.000	.655

2.5.6 Personal barriers

The analysis of personal barriers reveals that none of the personal barriers related to biological features – age, health and gender - are not important for any group of countries and for any type of R&D cooperation (Figure 19 and Figure 20). Gender is the least important while health and age have almost the same scores. Language skills inhibit just slightly more respondents from WBC&T to participate in FP and respondents from MS to participate in bilateral projects with WBC&T.

The most important barrier for both groups of countries and both types of cooperation involves the "unforeseen difficulties related to international cooperation". However, the t-test (Annex, Table 10) reveals that there is significant statistical difference regarding this barrier in WBC&T and MS. It indicates that respondents from WBC&T are more "afraid" of international cooperation, especially of FP programmes than their counterparts in MS.

Figure 19. Personal barriers for both groups of countries in FPs

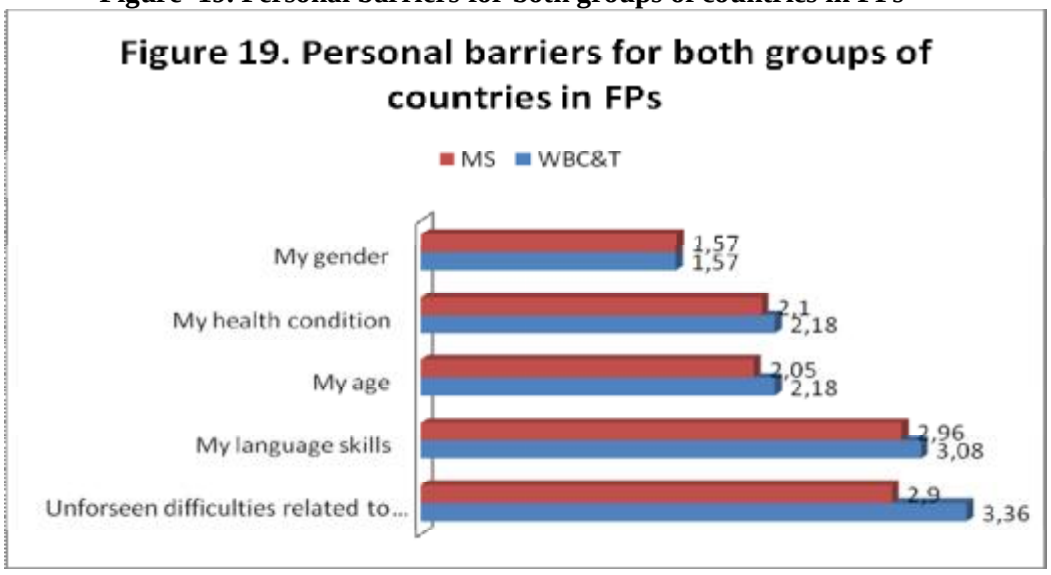
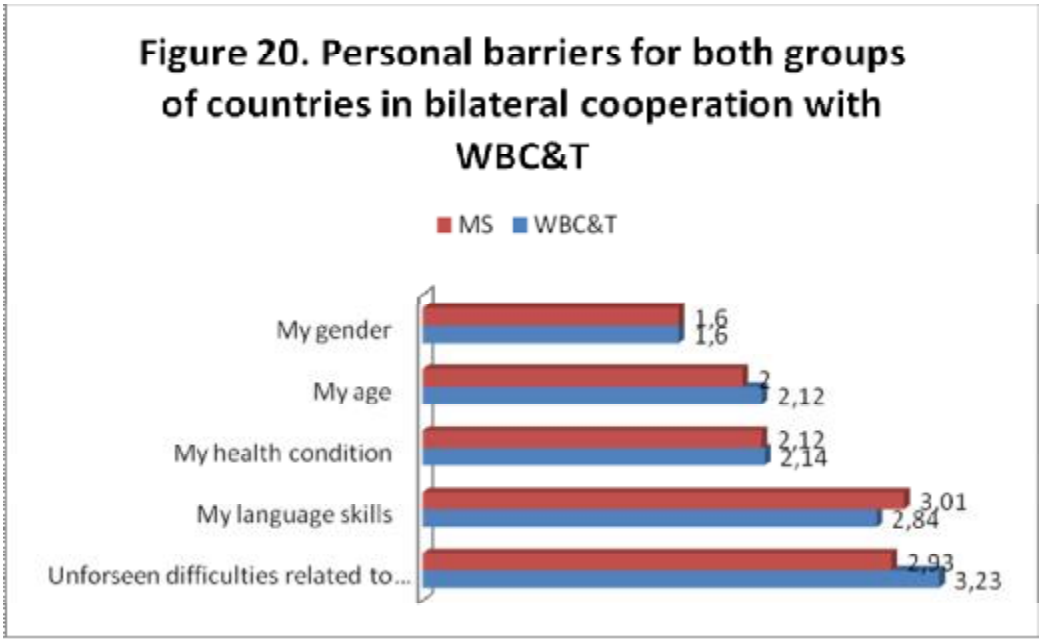


Figure 20: Personal barriers for both groups of countries in bilateral projects with WBC&T



2.6. Typology of barriers to research cooperation

2.6.1. Construction of scales of types of barriers (factor analysis)

Our main dependent variable consists of barriers of cooperation. Barriers of cooperation are operationalised through the total number of 58 items classified in the six main types of barriers we have previously identified:

1. administrative and bureaucratic barriers (15);
2. institutional capacity barriers on the level of research institution (11);
3. institutional capacity barriers on the national level (7);
4. barriers of scientific excellence (4);
5. socio cultural and political barriers (15);
6. personal barriers (6)

The two types of the standard Likert scale were used to evaluate the statements (items) (see the Chapter 1.5 – Sample and methodology). The scales of barriers are based on exploratory factorisation of 58 items of different barriers to cooperation. Factor analysis [12] (Extraction method: Principal component analysis and Varimax rotation) suggested nine factor solution which was reduced to six factors in order to make coherent typology of barriers.

[12] Factor analysis serves to discover simple patterns in the pattern of relationships among the variables. Scales constructed by the factor analysis groups together the statements (variables) which represent the coherent attitudes towards specific issues i.e. barriers for scientific cooperation

The first factor analysis run by all items i.e. which included all barriers together did not give us coherent and explicable solution for interpretation of barriers. Therefore, the socio-cultural and political barriers were analysed by separate factor analysis that suggested two factor solutions. These two factors are used to make another two scales which we named Political instability and EU scientific superiority.

These six factors we used to construct six scales of barriers with 25 items which finally represent the types of barriers.

We used Cronbach's Alpha to test the reliability of scales and dropped suggested items to increase Alpha.

Scales of types of the barriers:

Scale: Administrative barriers	**Cronbach's Alpha**
• **Payment delays by funding organisation** • **Constant changes in rules and procedures of project submission and monitoring** • **Differences in legal status of R&D institutions** • **Differences in tax regimes** • **Changes in project objectives, deliverables, budget or partners** • **Duration of project evaluation** • **Co-financial obligation of my institution** • **Time to response to various technical questions from EU or national administration**	.871
Scale: Institutional support	
• **My institution does not provide adequate professional and advisory support to international cooperation** • **My institution does not provide adequate professional assistance in project managing** • **My institution lacks skilled accounting professionals for FP or bilateral projects** • **Leadership is not engaged in finding appropriate call, scientific partners or niches** • **There is a lack of competent collaborators at my institution**	.871
Scale: Project management	
• **Finding out appropriate call or framework for cooperation** • **Finding out appropriate partner / building consortium** • **Understanding the application procedures** • **Technical knowledge on how to submit project proposal (e.g. on-line submission)**	.794
Scale: National scientific capacity	
• **My country has low overall international reputation and scientific "image"**	.772

• **We are suffering from parochialism - low national openness to the international collaboration** • **Lobbying skills of my country at the level of EU administration (with other national governments) are rather low** • **There are difficulties with researcher's mobility exchange (legal rules and procedures)**	
Scale: Financial gain	
• **Financial gain for me and my research team is negligible** • **Financial gain from international cooperation for my institution is negligible**	.808
Scale: Personal competitiveness	
• **My currently established networking and personal contacts in the international scientific networks are not sufficient for my participation in international research projects** • **My personal scientific status is not high enough for my participation in international research projects**	.696

The given scales of the type of barriers were done according to the scales of types of barriers for FP programme. We gave up our first intention to analyse separately scales of barriers for FP and bilateral projects since the difference between these two scales proved to be negligible.

The first extracted factor explaining 22.3% of variance (Annex, Table 11) is type of **Administrative barriers** which means that our respondents consider this type of barriers to be the most important barrier to cooperation. Administrative barriers consist of issues such as payment delays, constant changes in rules and procedures imposed by EC, differences in legal status of R&D institutions and tax regimes, etc.

The second factor is **Institutional support** which explains another 13.4% of variance. It concerns barriers formed by researchers' institutions' lack of capacity to provide them with adequate assistance for international cooperation. Although it explains an important part of variance, it is very interesting that it is not perceived as a highly important barrier neither in WBC&T nor in MS. This finding is coherent with the finding of descriptive analysis.

The third factor is **Project management** that explains the next 5.9% of variance. It consists of skills of researchers to manage projects in terms of finding appropriate calls and research partners and successful dealing with project submitting procedures. Barriers related to project management are very important in WBC&T and less important in MS.

Similar estimation is valid for **national scientific capacities** barriers such as countries' low overall international reputation and scientific "image", parochialism or low lobbying skills. These barriers are much more pronounced in WBC&T than in MS.

The last two barriers are **Financial gain** and **Personal competitiveness** but these factors turned out not to be barriers by the value of the means.

All these factors explain together 64.8 % of variance.

Looking at the means for each scale of barrier we can see that most important barriers are the "project management" (mean = 3.8917) and "administrative barrier" (mean= 3.6349). The barriers "institutional support", "national scientific capacity" and "financial gain" all have mean below 3 which means that our respondents do not evaluate them as important barriers. The "personal competitiveness" with a mean of 2 shows that personal scientific status and participation in scientific network are not perceived as barriers. Financial gain with a mean of 2.5 is also not perceived as barrier. More specifically, financial gains are rather encouraging factors since the majority of the respondents are satisfied with the financial resources they receive for their research teams and institution from funding agencies.

As we mentioned before, the separate factors analysis was made for the **socio-cultural and political barriers** which give us two scales named **Political instability** and **EU scientific superiority**. Political instability is made of three items related to political instability of the region, political antagonism between states and democratic deficits of some states.

The EU scientific superiority scale includes the two items that EU should invest in science of WBC&T to overcome the gap and that EU looks down on scientific potentials of WBC. In total, 27.359% of variance is explained by these factors.

Both barriers are concerned as medium important by both groups of countries. However, EU image of scientific superiority is concerned in WBC&T as much bigger barrier than in MS.

Scale: Political instability	**Cronbach's Alpha**
• **Political instability in the region hinder cooperation with WBC** • **Political antagonism within WBC reduce research cooperation among WBC** • **Democratic deficits of some WBC diminish research cooperation**	.703
Scale: EU scientific superiority	
• **EU should heavily invests in science of WBC to overcome their lagging behind EU** • **EU 27 look down on scientific potentials of WBC**	.600

2.6.2. Testing the hypotheses

1. Hypothesis: There is a difference in perception of R&D barriers for WBC&T and MS.

The independent sample t-test was used to test the significance of mean differences of respondents from WBC&T and MS. It reveals that the difference between WBC&T and MS is statistically significant in all six types of barriers (Annex, Table 12). Means for all barriers have higher value for respondents from WBC&T than from MS, i.e. all the barriers are more important for WBC&T. The most significant difference between WBC&T and MS is in the national scientific capacity. In fact, the deficiency of the national scientific capacity is perceived as important barrier for WBC&T while MS participants mostly do not consider it as a problematic issue.

Looking at the means for each scale of barrier we can see that most important barriers are the "project management" (mean = 3.8917) and "administrative barrier" (mean= 3.6349). "Institutional support", "national scientific capacity" and "financial gain" have all mean below 3 which means that tour respondents do not evaluate them as important barriers. The "personal competitiveness" with a mean of 2 shows that personal scientific status and participation in scientific network are not perceived as barriers.

The t-test for the scale of socio-cultural and political barriers shows that there is only one significant difference between WBC&T and MS - in "EU scientific superiority". This means that respondents from WBC see this image of EU superiority as more important than MS. There is no statistically significant difference in perception of "political instability" as barrier (Annex, Table 13)

2. Hypothesis: There is a difference in the three types of collaborative projects between WBC&T and MS.

For the purpose of our research we have identified three types of collaborative projects:

1. EU framework programme;
2. bilateral cooperation with WBC&T;
3. bilateral cooperation with MS.

The t-test of difference between the two groups of countries in their participation in FP projects is statistically significant indicating that the respondents from WBC&T participate in FP to a less extend than respondents from MS. Unlike FP projects, there is no significant difference between these two groups of countries in participation in bilateral projects with WBC&T. Finally, the t-test shows minimal significant difference between two groups of countries in participation in bilateral projects with MS. The WBC&T have slightly more bilateral projects with MS which confirms the finding of descriptive analysis.

We can conclude that our hypothesis is confirmed only for the cooperation within FP, i.e. the assumed low participation of WBC&T in FP confirm the lagging behind of WBC&T in ERA compared to MS.

3. Hypothesis: There is a difference in intensity of international R&D collaboration between WBC&T and MS.

The Chi-Square indicates that there is a statistically significant difference between these two groups of countries revealing that intensity is much more present among MS. For example, within MS 63% of respondents have the score of intensity either 3 or 4 (33.0% - score 3 plus 30% - score 4) while within WBC&T only 47.6% have the scores of 3 and 4 (Annex, Table 5, Chi-square).

We can conclude that our hypothesis 3 is conformed.

4. Hypothesis: The difference in perception of R&D barriers is related to the three main types of R&D cooperation:

a. **EU framework programme;**
b. **bilateral cooperation with WBC&T;**
c. **bilateral cooperation with MS.**

1. FP projects

T-test of independent samples shows that there is statistically significant difference in perception of barriers to cooperation between those respondents who have participated in FP and who have not. Participants without FP projects perceive barriers more important than those who participate in FP.

2. Bilateral projects with WBC&T

Participation in bilateral projects with WBC&T is not statistically significant for the perception of the barriers.

3. Bilateral projects with MS

However, the participants in the bilateral projects with MS influence the perception of only a few barriers. Statistically significant difference is in the perception of the three barriers: personal competitiveness, financial gain and institutional support. Respondents who have bilateral project with MS perceive financial gain and institutional support barriers a little bit more important than respondents without this type of cooperation.

Contrast to that, respondents without bilateral cooperation with MS perceive barriers of personal competiveness as more important than respondents with this type of cooperation. In short, for those who have bilateral projects with MS perceive barriers of institutional support and financial gain a little bit more important than those without this type of collaboration. That means that they are more critical about the support they receive from their research institutions as well as they are less satisfied

with the projects grants provided by the financers. Also, for them personal competitiveness is a smaller barrier than for those without that type of cooperation, that is, they are more confident in their personal competitiveness on the international research market.

There is no statistically significant difference in perception of socio-cultural and political barriers (political instability and EU scientific superiority) and any type of collaboration (FP, bilateral with WBC&T or MS).

It could be concluded that our hypothesis is partly confirmed since the difference in perception of barriers is confirmed for FP and to the smaller degree for the bilateral cooperation with MS.

5. Hypothesis: The intensity of cooperation influences the difference in perception of R&D barriers.

The ANOVA reveals that intensity of cooperation index is correlated with the four types of barriers received from factor analysis: administrative barriers, institutional support, financial gain and personal scientific competitiveness (Annex, Table 14 and Table 15).

Respondents with more intensive cooperation perceive administrative barriers as more important and personal competitiveness as less important for cooperation that repeats previously noticed pattern. Despite significant difference obtained by ANOVA for barriers “institutional support” and “financial gain”, there is no coherent result which would justify this difference. Therefore, the viable interpretation of impact of intensity on perception on barriers established only for the first two barriers: administrative barriers and personal scientific competitiveness.

There is no statistically significant difference in perception of the political instability and EU scientific superiority and the intensity of cooperation (Annex, Table 16 and Table 16).

It could be concluded that our hypothesis is only partly confirmed. i.e. for the two types of barriers.

6. Hypothesis: The difference in perception of R&D barriers is related to the socio-demographic characteristics of respondents (gender, age, type of intuitions, position, scientific fields, etc.).

The test of independent samples shows statistically significant difference between male and female respondents in perception of barriers. Only for two barriers – institutional support and EU image of scientific superiority- there is no statistical difference. The remaining six barriers - administrative barriers, project managing, national scientific capacity, financial gain, personal competitiveness and political instability - are perceived by female respondents as more important than for male

respondents. From the gender study perspectives, the research reveals again certain gender inequality among researchers.

Age of respondents influence only two barriers: younger researchers see financial gain and personal competitiveness as more important barriers. It means that they are not satisfied with the amount of research funds and that they are feeling inferior to older scientists.

Regarding scientific field the ANOVA reveals differences in perception of four barriers – institutional support, project management, and personal competitiveness and EU scientific superiority. Despite statistical differences obtained by ANOVA, there is no coherent result which would justify this difference.

The type of institution as a significant factor that might facilitate internal cooperation turned out in our analysis to be of certain importance in perception of barriers (Annex, Table 18). Generally, we may conclude that there is a difference in perceiving the barriers between higher education institutions and institutes (private and public). For higher education institutions more important barriers are: institutional support, projects management, financial gain, national scientific capacities. We can conclude that researchers' institutes are smaller and more flexible organisations which adapted to greater extent to the requirements of internal cooperation in the new circumstances. In contrast, higher education institutions are more inert and should make additional efforts to overcome these barriers.

We can conclude that significant impact of socio-demographic variables on perception of barriers is proved only in the cases of gender, age and type of institution. Barriers are perceived as more important for female researchers and within higher education institutions. In the case of age, younger researchers are not satisfied with the amount of research funds and that they are feeling inferior to older scientists.

7. Hypothesis: The difference in type of collaborative projects does not depend on socio-demographic variables.

For participation in FP projects statistically significant socio-demographic variables according to the chi-quadrate test are gender and type of institution. Again, women and participants from higher education institutions participate less in FP. Remaining independent variables (age and research field) are not significant.

There is statistically significant difference between age groups in participants in bilateral projects with WBC&T where the groups 36 to 59 (middle age group) have the majority of that type of bilateral projects. These types of bilateral projects are mostly located in the field of natural sciences and engineering and technology since chi-square test shows statically significant difference. Gender and type of institutions are not statistically significant for this type of cooperation.

Projects of bilateral cooperation with MS are concentrated in the higher education institutions and public institutes. Regarding research field, the majority of these

projects are in the field of natural science, engineering and technology. Gender and age of respondents are not significant for bilateral cooperation with MS.

We can conclude that regardless of type of collaborative projects, the same pattern emerges in the analysis of the potential impact of socio-demographic variables. The most significant independent variables that were statistically significant for all the three types of cooperation are the type of institution and research field. The majority of projects are located in higher education institutions and public institutes within natural science, engineering and technology. However, women and participants from higher education institutions participate less in FP.

8. Hypothesis: The difference in intensity of R&D cooperation does not depend on socio-demographic variables.

Intensity of international cooperation is statistically different according to the age groups of our respondents. Age group of 37 to 59 (middle age) have the most intensive cooperation. Statistically significant difference is also present in the type of the institution of current employment of the respondents and current position of researchers. Chi-square test shows that intensity of cooperation with the score 3 and 4 is mostly present in higher education institutions and public institutes (Annex, Table 19)

It also reveals that scientists on the higher posts (full professors /senior researches) have more intensive cooperation than associate or assistant professors or research fellows (Annex, Table 20).

We can conclude that our hypothesis is partially confirmed since only age and research filed as independent variables have no significant impact on the intensity of R&D cooperation. The most intensive cooperation have senior researchers and professors in the middle age group (37-59) who are located in the higher institutions and public institutes.

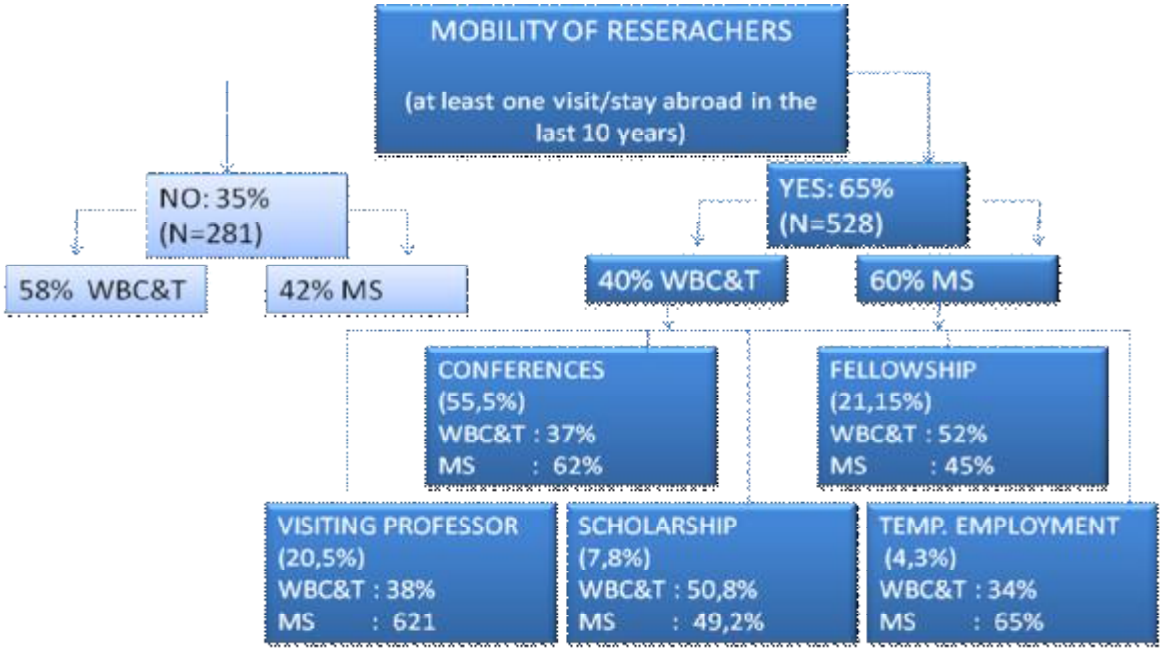
2.7 Mobility of researchers

2.7.1 Type of mobility

Mobility of researchers is measured by the visits to foreign countries or staying abroad for research conferences, fellowships, and visiting professors' positions. The analysis reveals that 65% of all respondents have been abroad (in the last ten years) for R&D purposes while 35% have been not. Almost 60% of respondents who have not been abroad are coming from WBC&T while remaining 40% are from MS. Out of the 65% of respondents who have been abroad 60% are from MS and 40% are from WBC&T (Figure 21). Within subgroup of countries, 43% of respondents from WBC&T and 27% respondents from MS have not been abroad (Annex, Table 21). This is rather a significant number of immobile and inert researchers, especially within WBC&T, which corresponds with the finding that 14% of respondents from MS and 31% from WBC&T have not participated in the collaborative research projects in the last 10 years. In both the cases - research mobility as well as international cooperation - MS are more active than in WBC&T.

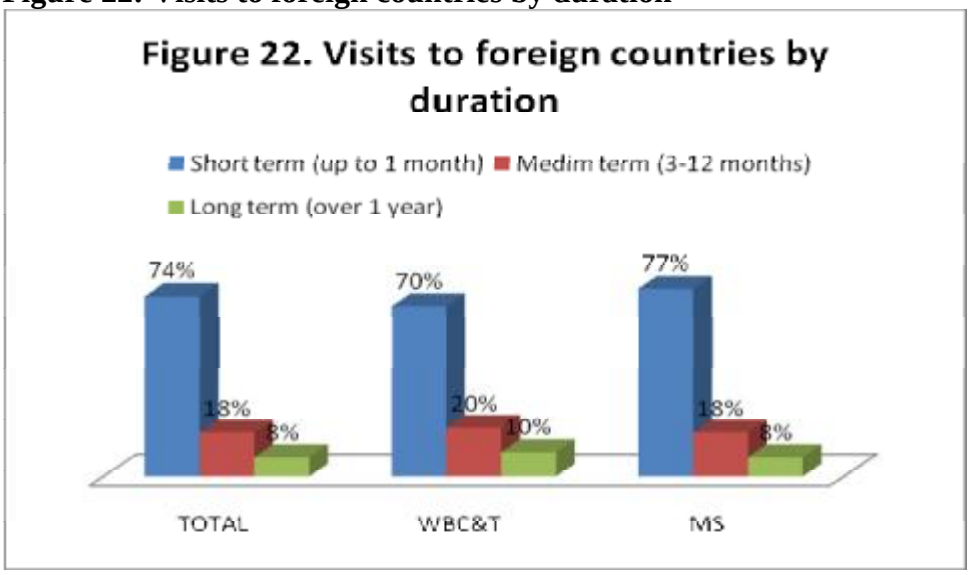
The most frequent type of visits is research conference since more than 55% of all visits abroad is made for this purpose. It is followed by the fellowships (21%) and visiting professors (20%) while scholarships and temporary stay abroad contribute with minor share – 7.8% and 4.3%, respectively (Figure 22).

Figure 21: Mobility of researchers by type of visit and group of countries



In compliance with the dominant type of visits (conferences, fellowships) which usually last for a few days, the majority of visits are short term (74%) in both groups of countries, while 18% of visits are medium term (up to three month) and 8% last for more than one year (such as scholarships and temporary employment) (Figure 22).

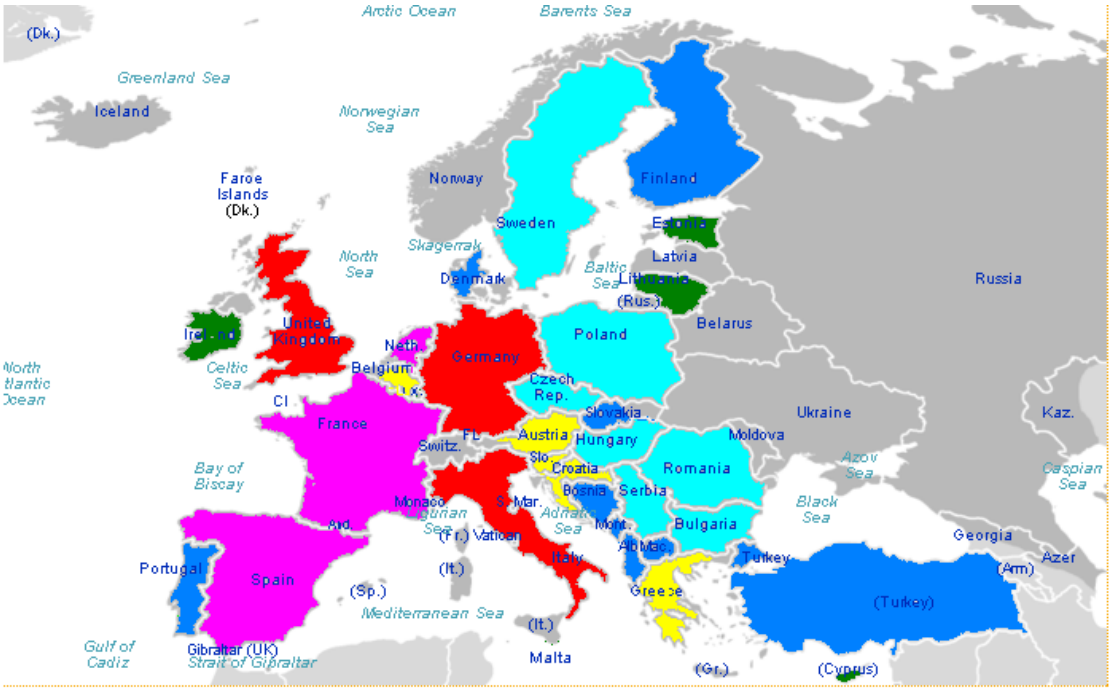
Figure 22: Visits to foreign countries by duration



2.7.2 Gravitation towards countries of cooperation

Gravitation towards countries of cooperation was measured by the longest stay/visit of respondents in selected countries. The analysis reveals that gravitation or the visit abroad are strongly concentrated in the three "old" and scientifically leading European countries: Germany which was selected by 121 respondents, Italy selected by 108 and United Kingdom selected by 103 respondents (Figure 23; see also Table 22 in Annex). The next group of countries (selected by 50 to 100 respondents) consists of Spain, France and the Netherlands, while countries which are selected by 40-50 respondents are Belgium, Slovenia, Austria, Croatia and Greece.

Figure 23: Inter-regional gravitation of researchers towards destination countries, both MS and WBC&T, by the longest visits or stays



Legend: Destination countries by number of selections by respondents:			
Above 100	**40-50**	**10-20**
50-100	**20-40**	**Under 10**

Serbia was selected by 34 respondents while remaining Balkan countries and Turkey were selected by less than 20 respondents. This data revels that researchers gravitate mostly towards Croatia and Serbia, then to Turkey, FYR of Macedonia, Bosnia and Herzegovina , Albania, Montenegro and finally to Kosovo/UNMIK Figure 24).

Figure 24: Intra-regional gravitation of researchers towards destination countries within WBC&T by the longest visits or stays

2.7.3. Obstacles of mobility: an insight

Within the sample of 809 respondents the problems related to mobility have been noticed 189 times (Table 18). Majority of mobility problems have been faced by respondents form WBC&T (74%) while only 26% or respondents from MS have faced these kinds of obstacles (mainly from Hungary and Slovenia). However, the obstacles faced by the respondents from Slovenian and Hungary cannot be classified since they are rather diffused. It means that various obstacles like visa, work permits, health insurance, taxation, social security, social fiscal number have been experience by a single or two respondents for each of the obstacle.

The most common problems that researchers from WBC&T have faced are problems with visa which occurred the most frequently among researchers from Serbia and FYR of Macedonia. In addition to visa, other problems are related to the work permits and health care insurance which mostly occurred among researchers from Croatia. Other administrative obstacles like residence permits, bringing family, social security or social fiscal number are not present to a large extend, most probably due to the low level of mobility among researchers from WBC&T. The problems with intellectual property rights are barely present since only one respondent noticed it as a problem.

Table 18: Barriers to mobility

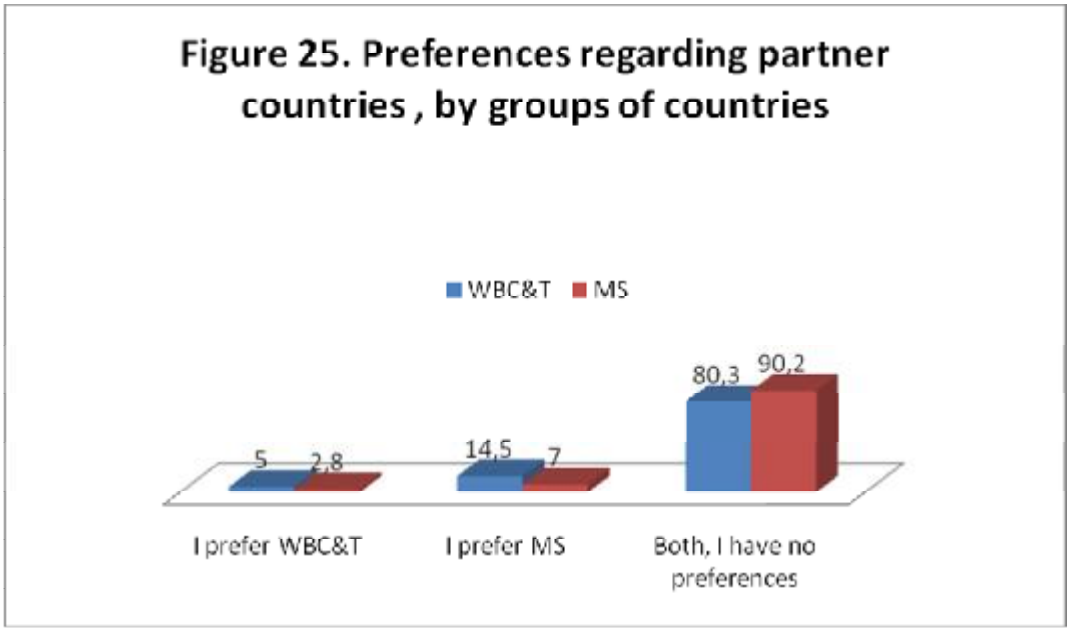
PROBLEMS	Visa	Residence permits	Work permits	Bringing family	Health-care insurance	Pension schemes	Taxation	Social security	Intellectual property rights	Social fiscal number	None of the above	Total number of problems	**Percent**
Valid	87	22	9	17	22	8	7	5	1	8	3	**189**	**100**
Albania(22)[1]	7	0	0	2	0	0	0	0	0	0		**9**	5%
Croatia (118)	4	5	2	2	4	2	2	2		1		**24**	12,7%
FYR of Macedonia (45)	13	1	0	1	1	0	0	0	0	0	0	**16**	8,5%
Montenegro (17)	4	1	0	1	0	0	0	0	0	0	0	**6**	3,2%
Serbia (108)	31	4	2	4	5	0	1	0	0	1	1	**49**	25,9%
Bosnia and Herzegovina (29)	11	4	1	2	0	0	0	0	0	0		**18**	9,6%
Turkey(36)	7	2	1	0	3	1	0	1	0	2	0	**17**	9%
TOTAL WBC&T													74%
TOTAL MS													26%

[1] Numbers in bracket are total number of respondents (N)

2.8. Preferences regarding partner countries for research cooperation

Although it was expected that the respondents would prefer to cooperate with MS rather than with WBC&T, the analysis reveals that respondents do not discriminate one group of countries in respect to another one. More than 80% of respondents from WBC&T and 90% of respondents from MS declared that they do not make any difference in preferences of countries in relation to their geo-political position (Figure 25). Only a very small portion of respondents from WBC&T (mainly from Croatia) would like to cooperate more with MS than with WBC&T.

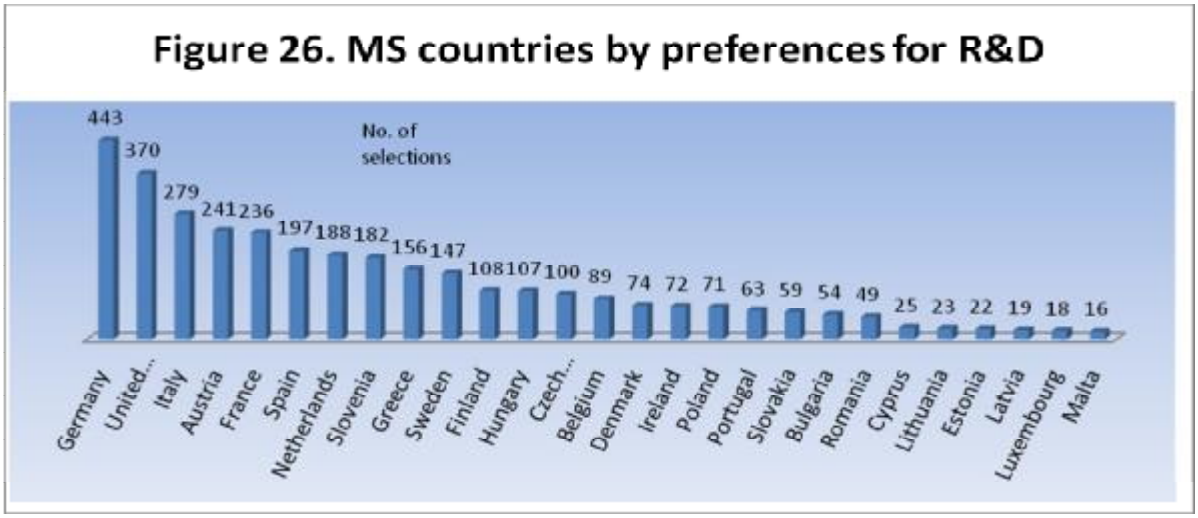
Figure 25: Preferences regarding partner countries by group of countries



When respondents were asked to make a choice and to select the three countries among MS they would prefer to cooperate with they selected Germany, United Kingdom and Italy (Figure 26). These three leading countries are followed by the Austria, France, Spain, Netherlands and Slovenia. The preferences of countries for research cooperation completely correspond with the existing gravitation of researchers towards - Germany, UK and Italy (and the subsequent-gravitation countries – France, Spain and the Netherlands) as the main destination countries of researchers' visits or staying abroad. A kind of exception are Austria and Slovenia which are not among the most frequent destination countries of existing gravitation but they are on the top of the list of the most preferred countries for cooperation. The reason behind is very probably their high attractiveness as potential research partners

for WBC&T coming from the established research cooperation based on bilateral projects.

Figure 26: MS countries by references for R/D cooperation



Germany and Italy are also the most preferred countries for cooperation within the subgroup of WBC&T. However, as mentioned before, highly preferred partners for R&D cooperation for WBC&T are also Austria and Slovenia. Besides, the respondent from Albania indicated Greece and respondents from Turkey indicated The Netherlands as highly preferred country for R&D cooperation (Table 22).

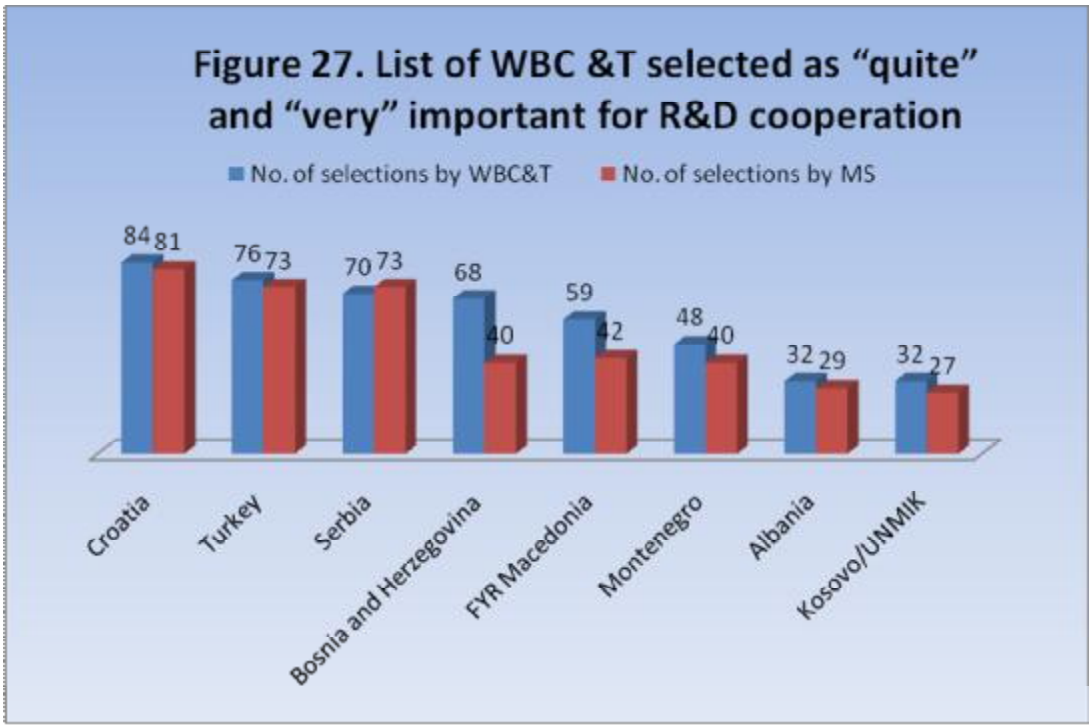
Table 19. List of countries preferred by WBC&T for R&D cooperation (based on selection of the three most preferable countries)

	Preferred countries for R&D cooperation					
	Austria	Germany	Greece	Italy	Slovenia	The Netherland
Albania		x	x	x		
Croatia	x	x		x		
FYR of Macedonia		x		x	x	
Montenegro		x		x	x	
Serbia	x	x		x	x	
Kosovo/UNMIK		x			x	
Bosnia and Herzegovina	x	x			x	
Turkey		x		x		x

Among WBC&T subgroup, Croatia, Turkey and Serbia are selected as the most important for cooperation by both groups of countries (MS and WBC&T) are (Figure 27). They are followed by Bosnia and Herzegovina, FYR of Macedonia and

Montenegro while the least desirable are Kosovo/UNMIK and Albania. These preferences follow the general patterns of existing R&D connections among countries. The cooperation with WBC&T countries are estimated as more important for R&D cooperation by WBC&T themselves except Serbia which is estimated as slightly more important by MS. The reason might come from the fact that Serbia has the highest research potentials within WBC&T, besides Croatia and Turkey. It is a new emerging country in the research map of the Western Balkan and attracts the attention of MS[13]. The largest difference between WBC&T and MS is related to Bosnia and Herzegovina since significantly more respondents from WBC&T estimates Bosnia and Herzegovina more important for R&D cooperation than respondents from MS.

Figure 27: List of WBC &T selected as "quite" and "very" important for R&D cooperation



This short overview of the existing and desired research connections provide a ground for the argument that the choice of the partner countries are shaped by the two criteria: criteria based on the established research connections and scientific excellence of the countries. Other studies CREST, 2007) come to the similar conclusion and emphasise that historical ties as well as geographical, cultural and linguistic proximity are still important factors in selecting partner countries.

[13] The level of financing of R&D in Serbia 2004 was 0.40% of GDP following the increasing trend (2000 – 0.10%, 2001 – 0.16%, 2002 – 0.26%, 2003 – 0.32%), Source: Aleksandar Popović: R&D in Serbia, Ministry of Science and Environmental Protection, Republic of Serbia (www.aso.zsi.at/attach/Brussels03022005-Popovic.ppt, 20.01. 2009)

PART THREE

Discussing the results

Intensity and type of cooperation

The survey reveals that the **dominant type** of projects in both groups of countries are projects funded by the EU Framework programmes since 64% of all projects within WBC&T, and 76% of all projects within MS are FP projects. Projects funded by the EU Framework programmes are the principle type of project in general since they count for 71% of all collaborative projects. Bilateral projects with MS count for another 20% while the least represented group are bilateral projects with WBC&T with only 9% of all projects.

However, t-test for differences between groups confirms our hypothesis that there is a significant difference between WBC&T and MS in their participation in FP projects (Hypothesis 2) since researchers from WBC&T participate in FP to smaller extend than respondents from MS. Unlike FP projects, there is no significant difference between these two groups of countries in participation in bilateral projects with WBC&T and MS. The respondents from WBC&T have more bilateral projects with WBC&T than with MS, while respondents from WBC&T have more bilateral projects with MS than WBC&T. It means that the respondents from both groups of countries reported more bilateral projects among the groups than bilateral projects within each of the groups.

The analysis of mobility of researchers and intensity of cooperation reveals that researchers from MS are much more mobile and active in international project collaboration than researchers from WBC&T. Although a significant proportion of all respondents (35%) stated that they have not visited or stayed abroad for research purposes in the last ten years, 65% of them are coming from WBC&T. Within the subgroups of countries, 43% of respondents from WBC&T and 27% respondents from MS have not been abroad for research purposes in the last ten years.
This is a rather significant number of internationally immobile researchers, especially within WBC&T, which roughly corresponds with the finding that 14% of respondents from MS and 31% from WBC&T have not participated in the international collaborative research projects in the last 10 years. Besides, the analysis of the *intensity of cooperation index* which consists of seven components (see Chapter 2.4) shows that 21.5% of the total respondents from the both groups of countries (WBC&T and MS) did not have any kind of cooperation, i.e. they have not answered positively to any of the seven components. Out of those 21.5% without cooperation, 67.2% are from WBC&T while 32.8% are from MS. Within MS 63% of respondents have the score of intensity either 3 or 4 (out of 7) while within WBC&T only 47.6% have the scores of 3 and 4. A statistically significant difference between these two groups of countries in research cooperation intensity is also confirmed by the Chi-Square test (Hypothesis 3).

The Chi-square test (Hypothesis 8) reveals that there is statistically significant difference in cooperation between different types of institution. The lack of cooperation is more present in private and public institutes/labs and government organisations, while the most intensive cooperation is located in the universities and again in the public institutes. Intensity of cooperation is also higher among researchers in the middle age groups (37-59) while gender and scientific fields do not have a significant impact on intensity of international research cooperation

We can conclude that a significant proportion of researchers from both groups of countries are not active in the international research cooperation. However, the proportion of inactive researchers are much higher in WBC&T than in MS since about 30 to 40% of respondents from WBC&T and about 15-30 % of researchers from MS are not active in international research collaboration. The dominant type of research projects in both groups of countries are projects funded by the EU FP but researchers from WBC&T participate in FPs to a significantly smaller extend than respondents from MS. They also significantly lag behind in intensity of participation in the different types of R&D cooperation since out of 21% of total researchers without any type of cooperation almost two thirds (67.2%) are from WBC&T. In order to facilitate the involvement of WBC&T in international research cooperation, the common and concerted actions should be undertaken from both national governments and the Europe Commission.

Mobility- gravitation-preferences

The analysis of mobility reveals that the short term visits to foreign countries such as conferences or fellowships are the dominant type of mobility of researchers from both groups of countries (74% of all visits abroad) while least represented are long-term visits (staying abroad longer than a year) such as scholarships and temporary employment (8% of all visits).

The mobility problems have been faced to a great extent by respondents from WBC&T (74%) while only 26% of respondents from MS have faced these kinds of obstacles (mainly from Hungary and Slovenia). The most common problems that researchers from WBC&T have faced are problems with visa (mostly among researchers from Serbia and FYR of Macedonia), work permits and health care insurance (mostly among researchers from Croatia). The problems with intellectual property rights are barely present since only one respondent noticed it as a problem.

The analysis of visits and staying abroad by destination countries reveals that researches regardless of the group of countries gravitate towards the three of the most economically and scientifically developed European countries: Germany, Italy and United Kingdom (above 100 selections). The next group of countries include Spain, France and the Netherlands. The main destination countries on inter-regional level, among WBC&T, are Croatia (45 selections), Serbia (34 selections) and Turkey (16 selections).

The analysis of preferences of both groups of countries for research cooperation reveals that preferences for partner countries completely correspond with the existing gravitation of researchers towards - Germany, UK and Italy as well as towards subsequent-gravitation countries – France, Spain and the Netherlands. A sort of exception are Austria and Slovenia which are not among the most frequent destination countries of exiting gravitation but they are topping the list of the most preferred countries for cooperation. As mentioned before (Chapter 2.3 Types of cooperation), the most intensive bilateral cooperation of WBC&T and MS is with Slovenia (39 projects), Austria (15 projects), Italy (4 projects) and France (9 projects) (Annex, Table 4). The reason behind is their high attractiveness as potential research partners for WBC&T stemming from the highest number of bilateral projects with these two countries in the region. WBC&T also selected Germany and Italy as the most preferred countries for R&D cooperation. Among WBC&T the most preferred countries for R&D cooperation for both groups of countries are Croatia, Turkey and Serbia which are currently also the main countries of destination within WBC&T region.

This short overview of the existing and desired research connections provide the ground for the argument that the choice of the partner countries are shaped by the two criteria:

1. Criteria based on the established research connections since preferences for partner countries in the future repeat the pattern of countries' cooperation in the past. These established connections could be rooted in the different path-depended socio-political and economic ties. For example, the most desirable countries for R&D cooperation for WBC&T are Germany and Italy which are at the same time the most frequent countries of destination when research mobility from WBC&T is concerned. The same is valid for Slovenia and Austria – the countries with the highest number of bilateral projects with WBC&T. Other studies[14] came to the similar conclusion and emphasised that historical ties as well as geographical, cultural and linguistic proximity are still important factors in selecting partner countries;
2. Criteria based on scientific excellence and related techno-economic power of the countries. It means that the most desirable countries are the scientifically most developed European countries – Germany, UK and Italy. Among WBC&T, the most preferred countries are Croatia Serbia and Turkey. These Balkan countries are the most promising for generating scientific results such as publications, successful completion of the projects, inclusion into the distinguished research networks, financial gains, professional prestige, etc.

It could be expected that the established cooperation will be further developed since they require the least efforts in familiarising with the partners, their interest, mode of operation and capabilities.

[14] Internationalisation of R&D – facing the Challenge of globalisation: approaches to a proactive international policy in S&T based on the report of the OMC Working group „Policy approaches towards S&T cooperation with third countries", EU, CREST; Brussels 13 December 2007

Motivation

The analysis of motives reveals that the **pattern** of motives for international research cooperation is very similar for both groups of countries and both types of cooperative projects. The three most important motives that consist of: /1/building up new research partnerships and networks, /2/ access to new sources of knowledge and technology and /3/ professional challenge, are actually identical for both groups of countries and both types of cooperation. **These motives, classified as science-driven motives, are in essence universal and typical for all scientific communities regardless their socio-economic, political, cultural or technological discrepancies**. However, the t-test shows that there is a statistically significant difference in motivation for R&D cooperation between WBC&T and MS, meaning that all the motives are much more emphasised in WBC&T then in MS. The largest difference in motivation is "availability of research equipment" which is, in contrast to MS, much more emphasised in WBC&T and points to the lack of adequate research infrastructure in WBC&T.

The next important group of motives is related to the scientific publications and financial matters. Financial matters consist of the three motives: /1/ gaining extra funds for research equipment, activities and travelling, /2/ funding regular research activities and /3/ incentive framework provided by the special calls (like INCO or bilateral R&D programmes). Extra funds are more important for WBC&T while funding the regular research activities is more important for MS. It might indicate that researchers from WBC&T are highly dependent on national budget resources and understand international projects like on-top funding. In contrast, researchers from MS try to diversify resources of funding for regular research activities and treat all the funds on equal footing. This is, very probably, the reason that incentive framework provided by the special calls (like INCO or bilateral programmes) are ranked as more important by MS than by WBC&T. The incentives provided within the bilateral programme framework and special calls play a significant role for involvement of MS in both bilateral projects and FP projects with WBC&T. In contrast to the incentives provided by the special calls/bilateral programmes, the financial support provided by the national governments as stimulation for international projects is among the least important motives, especially within WBC&T. It could indicate that financial stimulation provided by the national government for participation in FPs is rather weak, calling for the additional resources to stimulate R&D cooperation.

It is interesting that "professional prestige" and "meeting criteria for personal scientific career" are not perceived as very important motives for participation neither in FPs nor in bilateral projects with WBC&T (Table 20). It could indicate that evaluation criteria for researchers' promotion into the higher scientific grades within the national science polices do not recognise participation in international projects as an important element of researchers' activities. It seems that international projects are taken into account indirectly by the number of scientific papers, studies, participation in conferences, etc. Mobility of researchers and PhD students are also not perceived as very important motives for participation in the collaborative projects.

Barriers

Apart from the barriers of researchers' mobility, which are quite bigger for WBC&T than for MS (e.g. visas), this research reveals that **barriers for R&D cooperation in scientific world are quite universal**. The **pattern** of barriers as well as motivation for R&D cooperation is very similar for researchers from both groups of countries - WBC&T and MS - and for both types of collaborative projects (FPs and bilateral). This general finding is coherent with the conclusion of a previous analysis of bilateral R&D cooperation[15] that "there is no need for differentiation between old and new member states concerning the situation, function, conditions and procedures of S&T cooperation".

However, the analysis of the types of barriers (obtained by factor analysis) (Hypothesis 1) and t-test for differences between the groups of independent variables revealed that there is a **statistically significant difference in perception of almost all the barriers to research cooperation between WBC&T and MS regarding FP projects**. Differences in barriers of cooperation regarding type of projects - FP projects and bilateral projects - are not identified. A more detailed research is needed to see whether this conclusion is valid or whether it is an outcome of the mechanical "marking of boxes" that were the same for both types of projects. When designing the research, differences between these two types of collaborative projects were expected since the bilateral projects are much simpler than FP projects from the technical, administrative and bureaucratic point of view. Bilateral projects are relatively easy for setting up, absorb low management efforts and involve fewer risks comparing to FP projects.

The barriers to cooperation, the main dependent variable, **was analysed at two levels**. The first-level analysis refers to the **descriptive analysis** of the six pre-defined types (see the questionnaire) or sets of barriers, while for the second-level analysis a **factor analysis was used to** reduce the number of items and uncover the possible patterns in the relationships among the perception of barriers. Also we have tested the correlation between barriers as a dependent variable and independent variables (country of residence, age, gender, scientific fields, type of institution of current employment, position, type and index of intensity of cooperation).

Descriptive analysis

The t-test of differences between WBC&T and MS among barriers identified prior to field research and performed as a part of descriptive analysis, reveals that there is a significant statistical difference between WBC&T and MS in perception of almost all barriers (Table 20, column 5). It means, that all barriers are more emphasised in WBC&T than in MS. The only exception is the barrier "a small acceptance rate of

[15] E.g. SWOT analysis: Systematic Information Exchange on Bilateral RTD Programmes Targeting Southeast Europe, Report on 14 countries, WP1 within SEE-ERA.NET project, Institute Ivo Pilar, Zagreb, 2006 (see Chapter 1.2).

project proposals in relation to the large efforts invested in project preparation" which is classified within "administrative barriers". This barrier receives absolutely the highest score of mean of all the 58 barriers (mean=4.33 in MS and mean=4.31 WBC&T). Only this barrier is perceived as the greatest difficulty in MS than in WBC&T, very probably due to the fact that MS countries apply for FP projects more frequently than WBC. Therefore, MS are more exposed to international research competition and suffer the consequences of tough rivalry for research grants from EU funds.

The comparative ranking of the barriers (Table 20) shows that the most important barriers for both groups of countries and in the both types of cooperation (FP and bilateral projects with WBC&T) are barriers which are classified as **administrative and bureaucratic barriers.** The next group of barriers are **institutional barriers at the national level** and **socio-cultural and political barriers** which are ranked as medium important in both groups of countries. **Institutional barriers at the level of research institution** and **personal berries** are of medium importance for WBC&T and not important for MS Finally, **scientific excellence barriers** are important neither in WBC&T nor in MS. In other words, personal barriers are not perceived as barriers in MS while scientific excellence barriers are not perceived as barriers in none of the group of the countries.

The analysis of administrative barriers combined with the factor analysis 3 (Annex, Table 12) suggest a division of the administrative barriers into the two groups according to the source of origin and importance:

1. "Project management[16] barriers" which stem from the researchers' incapacities to manage the projects in terms of: finding appropriate call, finding research partners/building consortium, accounting and financial rules, understanding the application procedures (technical knowledge on how o submit project) and co-financial obligation of institution;
2. "Bureaucratic barriers" which stem from the modus operandi of EC administration, i.e. its mode of working and operating which includes the following obstacles: constant changes of the rules and procedures in project submission and monitoring, changes in projects objectives and deliverables, duration of project evaluation, payment delays and long response time to technical questions.

Although the "project management barriers" are perceived as the major barriers by both groups of researchers, it seems that "EC Bureaucratic barriers" enforce them to a great extent. It is reasonable to suppose that constant changes in rules and procedures diminish the ability of researches to understand, learn and easily apply the procedures for project establishing and submission.

[16] These barriers are classified as "project management" barriers in factor analysis

Table 20. Comparative table of the most important barriers in WBC&T and MS

1	2	3	4	5	6
Means value	**Most important barriers within respective type of barriers**	**WBC &T (rank)**	**MS (rank)**	**T-test Sign.**	**T-test: the largest mean difference (higher in the WBC&T)**
	Administrative barriers				
VERY IMPORTANT (m 4-5)	Small acceptance rate in relation to invested efforts	1	1	Yes (higher in MS)	**Differences in legal status of R&D institutions**
	Finding appropriate partner/build consortium	2	2	Yes	**Differences in tax regimes**
	Accounting and financial rules	3	3	Yes	**Technical knowledge on how to submit project proposal**
MEDI-UM IMPORTANT (m 3-4)	**Institutional barriers at national level**				
	Lobbying skills of my country at the level of EU administration are rather low	1	1	Yes	**My country has low overall international reputation and scientific image**
	We are lacking industrial partners and companies for research cooperation	2	2	Yes	**There are difficulties with researcher's mobility exchange**
	My country has low overall international reputation and scientific image	3	Bl[17] 3	Yes	**We are suffering from parochialism**
	Political and socio-cultural barriers				
	EU should heavily invests in science of WBC to overcome their lagging behind EU	1	1	Yes	**Same as the barrier**
	EU 27 look down on scientific potentials of WBC	2	Bl 3	Yes	**Same as the barrier**
	Scientific potentials of WBC stem from previous or current isolation of WBC from EU integration processes	3	Bl 3	Yes	**WBC are responsible themselves for their poor scientific status**
	Political instability in the region hinder cooperation with WBC	Bl 3	2	No	
	Democratic deficits of some WBC diminish research cooperation	Bl 3	3	No	
MEDIUM IMP. for WBC &T and NOT IMP. for MS	**Institutional barriers at the level of research organisation**				
	Occupation with other priorities	1	1 Bl.3	Yes	**Lack of adequate research equipment**
	Lack of skilled accounting professionals	2	2 Bl.3	Yes	**The same as the barrier**
	Lack of assistance in project managing	3	3 Bl. 3	Yes	**Low ICT capacities**
	Personal barriers				
	Unforeseen difficulties related to international cooperation	1	1 Bl.3	Yes	**The same as the barrier**
	My language skills	2	2 Bl.3	No	
NOT IMP. (Bl. 3)	**Scientific excellence barriers**				
	Lack of internationally recognised scientists	1	Bl. 2	Yes	**The same as the barrier**
	Low competitive scientific status of institution in the international research maps	2	1	Yes	**The same as the barrier**
	Weak personal connections and networking	**3**	**2**	**Yes**	**The same as the barrier**

Values of the means: Very important 4-5; Medium Important 3-4; Not important 2-3 or below

[17] Bl. = below; figure designate the value of the mean

These barriers call for more uniformity, consistency and stability in the mode of operation of EC administration as well as for more simplicity in announcing calls for proposals and building consortiums. It is reasonable to suppose that the complexity of process for project submission which is exhausting, long-lasting and time-consuming, is in direct relation to the principal barrier - "small acceptance rate in relation to invested efforts in projects preparation". The intensity of cooperation makes the perception of administrative barriers even worse since researchers with more intensive cooperation perceive administrative barriers as more important (Hypothesis 5).

It makes ground for the conviction that many researchers have not even tried to apply for FP project since they expect difficulties and complications. Such an assumption is proved by the analysis of personal barriers which shows that "unforeseen difficulties related to international cooperation" is ranked rather high – as medium important barrier. Besides, the t-test reveals that "unforeseen difficulties" are considered as much more important barriers for WBC&T than for MS. It could be stated that respondents from WBC&T are more anxious to participate in FPs than their counterparts in MS.

The analysis of variance (ANOVA) of **the difference in the perception of R&D barriers and the three main types of R&D cooperation (Hypothesis 4)** shows that there is a statistically significant difference in the perception of barriers to cooperation between those respondents who have participated in FP and those who have not. Participants who have not participated in FP projects perceive barriers more important than those who participate in FP. It could that indicate that experience in FP projects set them free from the fear of participation in FPs and unforeseen difficulties.

The next most important barriers for both groups of countries are barriers commonly named **"institutional capacities on the national level**" which refer to some general features of nation as a whole with the possible impact on international R&D cooperation. In the both groups of countries the most important barrier is **a lack of a country's lobbying skills** at the level of EU. It illustrates that researchers are convinced that negotiation process, very probably related to the general scientific image of a country, but regardless of its "geopolitical" categorisation (WBC or MS) is the most decisive factor for awarding a project. Although both groups of countries perceive the same barriers as very important, (e.g. lack of industrial partners, low scientific image of a country, difficulties in mobility of researchers, and parochialism[18]) the t- test reveals that these socio-cultural categories (apart from the lack of industrial partners) are perceived as much more important barriers in WBC&T than in MS.

The barrier designated as a "lack of benefit for national economy and technological development" is not perceived as an institutional barrier in any group of countries. It might be a result of the lack of straightforward relation between scientific cooperation and economic benefits.

[18] Low national openness to the international collaboration

Another intriguing finding is that **institutional capacities of research organisation are** not perceived as important barriers for research cooperation. In other words, researchers from both groups of countries are satisfied with the ability of their institutions to provide them with the professional support and assistance for participation in international research cooperation. More precisely, respondents from MS are quite satisfied with all the given elements of institutional capacities while respondents from WBC&T estimated that only four institutional characteristics are medium deficient. The deficiencies are connected to: lack of skilled accounting professionals, lack of assistance in project management, occupation with other activities within organisation and lack of adequate research equipment. The remaining institutional capacities which are perceived as quite satisfactory are: engagement of leadership in finding appropriate scientific partners and research niches, competency of collaborators, strategic orientation of research institutions towards research cooperation, ICT capacities, etc. Researchers are also satisfied with the financial gain for research teams and institutions from projects funds.

When research design was drafted it was expected that perception of these institutional barriers will be of the utmost importance to the researchers because institutional support could seriously harm or significantly advance their engagement in international cooperation. For example, the management of some research institutions collect the overhead costs from FP projects according to the model established for commercial projects. It is rather discouraging for researchers to cope with the difficulties of international projects and to "pay for that" to their institutions which strategic task should be just the opposite – to foster FPs. The most opportune way of researchers' reaction is their orientation towards national scientific projects funded by the national budget. However, some managers of the institutes complain that overhead costs foreseen by FPs are not sufficient to cover the real expenses which should be, therefore, covered by the national resources.

Besides, general national policy for international R&D cooperation should be implemented on the micro-level of institution in the way that facilitates and supports the efforts of each researcher to participate in the international R&D cooperation. Therefore, national policy measures should also regulate the treatment of FP projects at the institutional level, if necessary.

Since it is known from practice that engagement of research institutions in the promotion of international cooperation in WBC is rather poor, it seems that researchers are satisfied due to the lack of their awareness of what kind of assistance could be provided by research institutions and their management. For example, leadership should act pro-actively in finding calls and partner suitable for their institutions. They should act as the public relation services and constantly present the competences of their researchers and institutes among possible partners in MS. They should also stimulate international projects by some internal measures such as financial rewards, public announcements of success stories, awarding research novices, etc. The similar system should be established at the national level in relation to the individual research institution. The evaluation of participation in international

research projects could be a useful tool for establishing a system of rewording the institutes for cooperation.

The analysis of **political and socio-cultural** barriers revels that respondents avoid assertions which imply political and socio-cultural segregation between WBC&T and MS. The highest score of agreement by both groups of countries is assigned to such a politically correct and essentially plausible statement that EU should heavily invest in science of WBC&T to overcome their lagging behind. However, the t-test reveals that respondents WBC&T expect much more investments from EU than MS.

The ranking list of socio-cultural and political barriers shows that respondents from MS are not burdened with the socio-cultural and political differences and perceive them much less important barriers for research cooperation than respondents from WBC&T.

Analysis reveals that respondents from WBC&T are of the opinion that their poor R&D international cooperation is mainly due to **their own faults while behaviour of the EU partners contribute to a smaller degree.** Among EU failures they underline the EU image of scientific superiority expressed in the attitude that "EU looks down on scientists from WBC&T".

They also believe that scientific interests of the „old" MS (EU15) are oriented towards scientific partners like USA, Russia, Canada, Japan, India, Brazil or China which certainly diminish EU interest for WBC&T.

Among their own failures WBC&T include mutual political antagonism, overall political instability in the region and democratic deficits which diminish R&D cooperation. Besides, the important obstacle is their inferiority complex in relation to the advanced EU countries.

The t-test for equality of means reveals that respondents from MS, contrary to WBC&T, emphasise cultural differences between "western" countries and WBC as a reason which might hinder cooperation. We can suppose that cultural differences in this case refer to the different value ordinations which are not measured by our survey. Some previous research of social capital revealed that WBC&T share the same value ordination such as egalitarianism, statism, paternalism and the lack of trust in institutions which is quite different from dominant value orientations in the Western Europe.[19]

There is no statistically significant difference in perception of socio-cultural and political barriers (political instability and EU scientific superiority) with the type of collaboration (FP, bilateral with WBC&T or MS) and with the intensity of cooperation.

[19] For the study on social capital in Croatia see: Sekuć and Šporer, 2006·

The barriers connected to the perception of **scientific excellence** at individual, organisational and national level do not play a significant role in international cooperation.

Respondents are mostly satisfied with their personal scientific status and international connections (networking). Putting it another way, they are convinced that their scientific competences and connections are sufficient for participation in international projects. They are a little bit less satisfied with the competitive status of their institutions at the international "research maps" while they are at least satisfied with the amount of the internationally recognised scientists in the country. However, they do not agree with the statement that their countries suffer from the lack of prominent scientists.

The analysis of personal barriers reveals that none of the personal barriers related to age, health and gender are important for any group of countries and for any type of R&D cooperation. Gender is the least important while health and age have almost the same scores. Language skills inhibit just slightly more respondents from WBC&T to participate in FP and respondents from MS to participate in bilateral projects with WBC&T.

Finally, the significant impact of socio-demographic variables on perception of barriers **(Hypothesis 6)** is proved only in case of gender, age and type of institution. Barriers are perceived as more important for female researchers and within higher education institutions. Regarding the age of respondents, younger researchers are not satisfied with the amount of research funds and are feeling inferior compared to older scientists. Chi-square test reveals that statistically significant difference in impact of socio-demographic variables on FP projects (Hypothesis 7) is only in gender and type of institution. Women and participants from higher education institutions participate less in FP while remaining independent variables (age, research field, position, etc.) are not significant.

Generally, we may conclude that there is a difference in perceiving the barriers between higher education institutions and institutes (private and public). For higher education institutions the most important barriers are: institutional support, project management, financial gain, national scientific capacities. We can suppose that researcher institutes are smaller and more flexible organisations which can adapt faster and more efficiently to the requirements of internal cooperation in the new circumstances. In contrast, higher education institutions are more inert and should make additional efforts to overcome current barriers of the R&D international cooperation.

Factor analysis

Six scales of barriers obtained by factor analysis roughly correspond to the types of barriers identified prior to field research and confirm that the initial theoretical

framework was well defined. The barriers that yielded from the factor analysis and explain the 64.8 % of variance are:

- **administrative barriers** which concern some shortcomings of rules and procedures imposed by the EC administration;
- **institutional support** that concerns the institutional capacity of research institutions to provide adequate professional and advisory support to researchers in international cooperation;
- **project management** that consists of skills of researchers to manage projects in terms of finding appropriate call for partners and successful dealing with project submitting procedures;
- the **national scientific capacities** concern the countries' low overall international reputation and scientific "image", parochialism, low lobbying skills, etc;
- the last two barriers are **financial gain** and **personal competitiveness but they turned out not to be barriers.** More specifically, financial gains are rather encouraging factors since majority of respondents are satisfied with the financial resources they receive.

Testing the hypotheses revealed the following results:

Hypothesis 1: There is a difference in perception of R&D barriers for WBC&T and MS.

The hypothesis is confirmed. The factor analysis reveals that the difference between WBC&T and MS in the perception of barriers for R&D cooperation is statistically significant in all six types of barriers. It points to the fact that all the barriers are more important for WBC&T than for MS.

The most significant difference between WBC&T and MS is in the national scientific capacity which consists of hampering factors such as: low international reputation and scientific image of the country, parochialism, lack of lobbing skills with the EU administration and difficulties in research mobility. In fact, the deficiency of the national scientific capacity is perceived as an important barrier for WBC&T while MS participants mostly do not consider it as a problematic issue.

Looking at the means for each scale of barrier we can see that most important barriers are the "project management" (mean = 3.8917) and "administrative barrier" (mean= 3.6349). The barriers "institutional support", "national scientific capacity" and "financial gain" have a mean below 3 which means that our respondents do not evaluate them as important barriers. The "personal competitiveness" with a mean of 2 shows that personal scientific status and participation in scientific network are not perceived as barriers. Financial gain with mean 2.5 is also not perceived as barrier. More exactly, financial gains are rather encouraging factors since majority of respondents are satisfied with financial resources they receive for their research teams and institution from funding agencies.

As we mentioned before, the separate factors analysis was made for the **socio-cultural and political barriers** and gave us two scales: **political instability** and **EU scientific superiority**. Looking at the means for each of these two scales, we can see that EU scientific superiority is estimated as more important barrier (mean= 3.3622) than political instability (mean=3.1195).

The t-test shows that significant difference between WBC&T and MS is valid for "EU scientific superiority" while there is no difference in the perception of "political instability" between these two groups of countries. It means that respondents from WBC&T see the EU superiority as a more important hampering factor for their integration into the international cooperation than MS. Researchers from the WBC&T sometimes complain about their roles in FPs which are reduced to technical accomplishments such as measurements, equipment maintenance, data collecting, etc. Their position within large research consortiums deserves a special analysis.

Hypothesis 2: There is a difference in the three types of collaborative projects between WBC&T and MS.

For the purpose of our research we have identified three types of collaborative projects:

1. EU framework programme;
2. bilateral cooperation with WBC&T;
3. bilateral cooperation with MS.

Hypothesis 1 is confirmed only for the cooperation within FPs. It means that researchers from WBC&T participate in FP to smaller extend that respondents from MS. Unlike FP projects, there is no significant difference between these two groups of countries in participation in bilateral projects.

Hypothesis 3: There is a difference in intensity of international R&D collaboration between WBC&T and MS.

Hypothesis 3 is confirmed. The Chi-Square test indicates that there is a statistically significant difference between these two groups of countries revealing that intensity is much more present among MS. For example, within MS 63% of respondents have the score of intensity either 3 or 4 (33.0% - score 3 plus 30% - score 4) while within WBC&T only 47.6% have the scores of 3 and 4 (Annex, Table 5, Chi-square).

Hypothesis 4: The difference in perception of R&D barriers is related to the three main types of R&D cooperation:

a. EU framework programme;
b. bilateral cooperation with WBC&T;
c. bilateral cooperation with MS.

The hypothesis is partly confirmed since the difference in perception of barriers is confirmed for FP and to the smaller degree for the bilateral cooperation with MS. T-

test of independent samples shows that there is statistically significant difference in perception of barriers to cooperation between those respondents who have participated in FP and who have not. Participants without FP projects perceive barriers more important than those who participate in FP.

Hypothesis 5: The intensity of cooperation influences the difference in perception of R&D barriers.

Hypothesis is only partly confirmed, i.e. for the two types of barriers. Respondents with more intensive cooperation perceive administrative barriers as more important and personal competitiveness as less important for cooperation that repeats previously noticed pattern.

Hypothesis 6: The difference in perception of R&D barriers is related to the socio-demographic characteristics of respondents (gender, age, type of intuitions, position, scientific fields, etc.).

Hypothesis is partly confirmed. We can conclude that significant impact of socio-demographic variables on perception of barriers is proved only in the cases of gender, age and type of institution. Barriers are perceived as more important for female researchers and within higher education institutions. In case of age younger researchers are not satisfied with the amount of research funds and that they are feeling inferior to older scientists.

Hypothesis 7: The difference in type of collaborative projects does not depend on socio-demographic variables.

Hypothesis is partly confirmed. We can conclude that regardless of type of collaborative projects, the same pattern emerges in the analysis of the potential impact of socio-demographic variables. The most significant independent variables that were statistically significant for the all three types of cooperation are the type of institution and research field. The majority of projects are located in higher education institutions and public institutes within natural science and engineering and technology. However, women and participants from higher education institutions participate less in FP.

Hypothesis 8: The difference in intensity of R&D cooperation does not depend on socio-demographic variables.

Hypothesis is partially confirmed since only age and research filed as independent variables have no significant impact on the intensity of R&D cooperation. senior researchers and professors in the middle age group (37-59) who are located in the higher institutions and public institutes have the most intensive cooperation .

PART FOUR

Conclusions and recommendations

We can conclude that researchers from WBC&T significantly lag behind researchers from MS in international research mobility and research projects funded by the EU Framework programmes (FPs). For example, the *intensity of cooperation index* consisted of seven components shows that out of 21.5% of respondents without any kind of cooperation (they have not answered positively to any of the seven components) 67.2% are coming from WBC&T.

The pattern of barriers as well as motives for R&D cooperation is very similar for researchers from both groups of countries - WBC&T and MS - and for both types of collaborative projects (FPs and bilateral). It supports the thesis that the driving forces to pursue scientific career and problems of researchers are quite universal and common for the entire scientific community. However, this common wisdom is misleading as far as the intensity of cooperation and barriers to cooperation in FPs are concerned.

The testing of the hypotheses revealed the following:

- there is a significant difference between WBC&T and MS in the perception of almost all barriers to research cooperation regarding FP projects, meaning that all the barriers are much more emphasised in WBC&T than in MS (Hypothesis 1);
- there is a significant difference between WBC&T and MS in their intensity of cooperation in FPs since WBC&T participate in FPs to a significantly smaller extend than respondents from MS (Hypothesis 2);
- there is a significant difference between WBC&T and MS in the intensity of their international research cooperation in general (Hypothesis 3);

The most important barriers by both groups of countries and in both types of cooperation (FP and bilateral projects with WBC&T) are barriers which are classified as **administrative barriers** divided into two groups: **project management barriers** and **EC bureaucratic barriers**. The next group of barriers are **institutional barriers at national level** and **socio-cultural and political barriers** which are ranked as medium important in both groups of countries. **Institutional barriers at the level of research institution** and **personal barriers** are of medium importance for WBC&T and not important for MS. Finally, **scientific excellence barriers** are not important either in WBC&T or in MS.

Since the t-test of differences between groups and factor analysis revealed that difference between barriers for participation in FPs and bilateral projects proved to be negligible, the need for applying different policy measures and instruments for integration of WBC&T in international cooperation compared to MS are needed only in the case of FPs. In case of bilateral projects no differentiation is needed concerning conditions and procedures of R&D cooperation.

Establishing the fact that the biggest difficulties for participation in FPs are perceived in administrative barriers, e.g. project management barriers and EC administrate barriers, the first tasks to overcome these barriers is to build capacity of WBC&T for participation in FPs and to make EC procedures for establishing FPs projects more "user friendly". Therefore, a proper mix of research policy measures to address the capability building of WBC is needed and it should include the measures at the two levels: national level and the level of EC.

Based on the analysis of the barriers the following measures can be proposed:

EC level

1. At the level of EC, policy measures should concern mainly the simplification of the procedures or at least making them more transparent, clear and understandable. The argument for introducing the proposed measure is the finding that intensity of cooperation makes the perception of administrative barriers worse since researchers with more intensive cooperation perceive administrative barriers as more important (Hypothesis 5).
2. It would be useful to open the national research programmes to researchers from WBC&T in order to overcome cultural differences regarding the standard of scientific work such as: differences in quality of working methods, conducting research, organisational culture and management of the projects. It should be stressed that some countries[20] already run the programmes for international mobility of researchers which allow foreigners to participate and lead projects financed by national resources;
3. In order to provide training of researchers from WBC&T countries both in the management of the projects and in the management of international cooperation within research institutions, a model of "twining projects" and resident twining advisers (RTA) which was performed within CARDS programme might be useful to be applied. It means that consultants experienced in EC bureaucracy who would like to work in WBC&T (e.g. retired scientists/officers) could stay for a longer period in a WBC&T country and help national administration to incorporate the EC legislation and procedures into the national legislation and science policy. They could also help the management of the institutes to create institutional strategy for international cooperation or to help scientists to lead the projects;
4. It would be useful to open the current FP Networks of Excellence projects for participation of researchers from WBC&T [21]. All measures which involve

[20] See, for example, the "Brain gain" programme in Croatia managed by the National Science Foundation (NSF).

[21] This measure was proposed during the Consultation meeting on research priority settings in the sector of ICT, held in Belgrade, 10-12 December, 2008

WBC&T researches in FPs are very welcome since the analysis reveals that the experiences in FP projects release them from the fear of participation in FPs.

National level

The national science policy makers should create measures to stimulate both individual researches and research institutions to participate in FPs. In addition to workshops, training, seminars, etc. which are in a full swing in some countries (e.g. Croatia), a range of other possible measures could be also viable:

1. The financial incentives are always a good instrument for fostering cooperation. It is supported by the analysis of the motives of cooperation which reveals that financial gain is important driving force of cooperation. On the other hand, analysis showed that financial support provided by the national governments is among the least important motives and provides an argument that there is a lot of room for such incentives. Besides, extra funds are more important for WBC&T (although on the bottom of the list of motives) but can be decisive for researchers to decide to apply for a project. In this initial phase of incorporation of WBC&T in FPs, when research are mainly dependent on national budget and not used to diversify the funds for their research, the extra funds for project preparation could significantly stimulate researchers to participate in FPs, especially when resources for R&D are scarce[22]. It is also important to break the researchers' fears that EU funding will substitute, not complement, the national budget resources for research grants. It might have disastrous effects on the majority of WBC&T researches since they are not sufficiently competitive and integrated into the international networks;

2. Participation in international projects should be taken into account for individual researcher's promotion into higher grades, something that is not (to available knowledge) currently incorporated in the science policy of many WBC&T countries. The international participation is valorised only indirectly, by the number of scientific papers, studies, participation in conferences. However, these results can be obtained in many different ways not necessarily trough international projects. It could happen that some researchers gain high scientific posts without any or very modest international cooperation activity;

3. National science policy should also take care about the creation and implementation of strategy for fostering FPs at the level of research institutions and universities. Involvement in international projects should be standard evaluation criteria of the success and quality of research institutions. The adequate financial incentives (awards, new equipment or similar instruments) could be related to such evaluations;

[22] A good example is the recent increase of such resources by the Ministry of Science, Education and Sports in Croatia

4. It was expressed by the respondents that overhead costs (costs of administrative staff, legal and accounting offices, international phone calls, photocopying and mailing if not specified in the project contract) foreseen for FPs are not sufficient to be able to cover the real expenses. National governments should therefore take into the consideration these costs and prepare such a measure that will stimulate institutes from WBC&T to participate in FPs. Therefore recommendation is that if required from project partners, overhead costs should be also partly covered from the national budget as well as unexpected costs if they are justified and not caused by a fault of the research institution;

5. The domination of administrative barriers suggests an urgent need for education activities and strategies by the national governments for building professional and technical skills of researchers for participation in FPs. The establishment of a system of interface institutions between researchers and EU administration might be helpful;

6. Special care should be devoted to the capacity building at the level of research institutions. Although analysis revealed that researchers are relatively satisfied with the assistance provided by their institutions and by the efforts of their leaderships, it seems that this satisfaction is coming primarily from the lack of their awareness of what kind of additional assistance they can expect. It would be useful to establish a system of intermediaries – a network of consultants or scientific managers located in the larger institutes, universities or consortium of interested parties who would act as the interface between researches/institutions and EU administration. Scientific mangers should deal with FPs projects in an active way: they should not only disseminate information but actively search for calls and partners, initiate and promote cooperation among researchers and provide assistance. The system of awarding of scientific managers should reflect their efficiency and successfulness. According to many researchers the existing networks of National contact points (NCP) are not sufficient.

Based on the difficulties in drafting the sample of respondents due to the lack of comprehensive databases, an important aspect of policy coordination is the improvement of the information system of international cooperation. The stress is on both - public availability of the project data on the national level (inventories of bilateral/multilateral and FPs projects) as well as on the EC level. The databases should provide searching possibility by different criteria like projects partners, country, name of the projects, type of projects (SSA, Tempus, Cooperation), scientific fields, etc. Presently, these data are not publicly available on the national level while the EC databases are very difficult to search according to the needed criteria for analytical purposes.

In drafting the design of the research it was supposed that the main barrier in cooperation between WBC&T and MS is their weak capability to meet the criteria of science excellence that make them second-class research partners. However, this survey reveals that researchers do not discriminate one group of countries in respect to

another- at least not on the declarative level- since more than 80% of respondents from WBC&T and 90% of respondents from MS declared that they do not have preferences regarding partner countries. Besides, there is no significant difference in barriers of cooperation between FP projects and bilateral projects with WBC&T, which also illustrates that researchers do not make segregation between these two types of cooperation. Finally, it is rather important that researchers from MS do not think that cooperation with WBC&T is of low relevance for their scientific careers.

It seems that researchers from developed countries are really prepared to cooperate with WBC&T and that the drivers of cooperation are hidden in some other factors, different from pure scientific excellence and established path-dependent connections. These different factors are mainly recognised in the policy measures for fostering cooperation with WBC&T such as special support actions (SSA) and networking programmes within FPs (such as INCO) and bilateral framework programmes. These specially tailored programmes attract researchers from developed countries to cooperate with their less developed partners. It would be worth thinking how some similar schemes could be applied on the FP thematic research programmes which are driven by the scientific motives and not by the motives of networking and supporting connections among countries.

In other words, special supporting measures can be devised to increase the participation of WBC in the programmes such as “Collaborative research” within FP7 which supports research activities and establishing excellent research projects. For example, a special sub-programmes for supporting research priorities of mutual interest of WBC identified within the WBC-INCO.NET Work-package 2 (Priority setting to structure participation in FP) can be established to foster research excellence in WBC in the areas of their research competence. The participation of interested partners from MS could be mandatory or could contribute to the evaluation report of the projects proposals.

Besides, the “information and presentation day” of institutions from WBC within each of the thematic area could be organised to inform EU MS partners about the capacities, specific knowledge and other potentials of the research institutions from WBC. These and similar instruments could help to overcome closure and peculiarity of small science communities of WBC to be integrated in the ERA.

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Statistical annex

Table 1. Number of respondents by country of residence

Country of residence	No. of respondents	%
Croatia	118	14,6
Serbia	108	13,3
FYR Macedonia	45	5,6
Turkey	36	4,4
Bosnia and Hercegovina	29	3,6
Albania	22	2,7
Montenegro	17	2,1
Kosovo / UNMIK	4	0,5
TOTAL WBC and Turkey	379	46,8
Italy	87	10,8
Germany	61	7,5
Slovenia	54	6,7
Austria	45	5,6
Greece	43	5,3
Hungary	38	4,7
Bulgaria	32	4
Romania	32	4
France	31	3,8
Other MS (Slovakia, UK, Latvia and Sweden)	7	0,8
TOTAL MS	430	53,2
GRAND TOTAL	809	100

WBC&T
46.8% of respondents

EU MS
53.2% of respondents

Table 2. T-test for equality of means for motives of cooperation between WBC&T and MS in the EU FP

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
16 - 1. FP Incentive framework provided by the special calls or actions (e.g. INCO, bilateral research programmes)	Equal variances assumed	3,691	,055	,833	757	,405	,056	,067	-,076	,187
	Equal variances not assumed			,829	723,866	,408	,056	,067	-,076	,188
16 - 2. FP Meeting criteria for my personal scientific carrier (promotion to higher grades)	Equal variances assumed	18,654	,000	4,991	782	,000	,456	,091	,277	,635
	Equal variances not assumed			5,018	781,993	,000	,456	,091	,278	,634
16 - 3. FP Funding my regular research activities	Equal variances assumed	1,009	,315	1,551	787	,121	,105	,068	-,028	,239
	Equal variances not assumed			1,558	786,313	,120	,105	,068	-,027	,238
16 - 4. FP Extra funds for research equipment, activities and travelling	Equal variances assumed	12,284	,000	4,499	791	,000	,279	,062	,157	,401
	Equal variances not assumed			4,556	781,043	,000	,279	,061	,159	,399
16 - 5. FP Funds for extra salary (honorarium)	Equal variances assumed	20,945	,000	7,987	781	,000	,749	,094	,565	,933
	Equal variances not assumed			8,071	775,670	,000	,749	,093	,567	,931
16 - 6. FP Access to new sources of knowledge and technology	Equal variances assumed	32,187	,000	3,752	781	,000	,178	,047	,085	,271
	Equal variances not assumed			3,796	767,771	,000	,178	,047	,086	,270
16 - 7. FP Building up new research partnerships and networks	Equal variances assumed	8,087	,005	1,822	784	,069	,080	,044	-,006	,166
	Equal variances not assumed			1,834	783,958	,067	,080	,044	-,006	,165
16 - 8. FP Using equipment I do not have in my country	Equal variances assumed	60,081	,000	8,898	776	,000	,828	,093	,645	1,011
	Equal variances not assumed			9,032	757,718	,000	,828	,092	,648	1,008
16 - 9. FP Government financial incentives for international cooperation	Equal variances assumed	14,168	,000	3,210	767	,001	,272	,085	,106	,438
	Equal variances not assumed			3,238	766,996	,001	,272	,084	,107	,437
16 - 10. FP Publishing new scientific papers	Equal variances assumed	11,354	,001	3,537	784	,000	,243	,069	,108	,379
	Equal variances not assumed			3,585	774,321	,000	,243	,068	,110	,377
16 - 11. FP Producing new patents/licenses or commercial results	Equal variances assumed	4,428	,036	4,260	748	,000	,409	,096	,220	,597
	Equal variances not assumed			4,289	743,863	,000	,409	,095	,222	,596
16 - 12. FP Professional prestige in the research community	Equal variances assumed	,839	,360	1,213	783	,225	,091	,075	-,056	,238
	Equal variances not assumed			1,216	777,183	,224	,091	,075	-,056	,238
16 - 13. FP Enable mobility of PhD students	Equal variances assumed	10,470	,001	4,992	771	,000	,406	,081	,247	,566
	Equal variances not assumed			5,055	763,076	,000	,406	,080	,249	,564
16 - 14. FP Enable my own international mobility	Equal variances assumed	6,486	,011	4,504	781	,000	,344	,076	,194	,493
	Equal variances not assumed			4,544	778,947	,000	,344	,076	,195	,492
16 - 15. FP Professional challenge	Equal variances assumed	15,454	,000	4,638	780	,000	,289	,062	,167	,412
	Equal variances not assumed			4,690	772,171	,000	,289	,062	,168	,410

Table 3. T-test for equality of means for motives of cooperation between WBC&T and MS in the bilateral projects with WBC&T.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
16 - 1. WBC Incentive framework provided by the special calls or actions (e.g. INCO, bilateral research programmes)	Equal variances assumed	1,175	,279	1,358	733	,175	,098	,072	-,044	,240
	Equal variances not assumed			1,357	723,851	,175	,098	,072	-,044	,240
16 - 2. WBCMeeting criteria for my personal scientific carrier (promotion to higher grades)	Equal variances assumed	13,382	,000	6,453	756	,000	,579	,090	,403	,755
	Equal variances not assumed			6,488	755,995	,000	,579	,089	,404	,754
16 - 3. WBC Funding my regular research activities	Equal variances assumed	6,811	,009	3,100	760	,002	,255	,082	,093	,416
	Equal variances not assumed			3,116	759,812	,002	,255	,082	,094	,415
16 - 4. WBC Extra funds for research equipment, activities and travelling	Equal variances assumed	8,632	,003	3,913	766	,000	,312	,080	,156	,469
	Equal variances not assumed			3,943	765,965	,000	,312	,079	,157	,468
16 - 5. WBC Funds for extra salary (honorarium)	Equal variances assumed	10,549	,001	7,763	758	,000	,742	,096	,554	,929
	Equal variances not assumed			7,817	757,973	,000	,742	,095	,556	,928
16 - 6. WBC Access to new sources of knowledge and technology	Equal variances assumed	1,015	,314	2,717	763	,007	,209	,077	,058	,360
	Equal variances not assumed			2,729	762,907	,006	,209	,077	,059	,359
16 - 7. WBC Building up new research partnerships and networks	Equal variances assumed	,120	,730	,240	766	,811	,013	,056	-,097	,124
	Equal variances not assumed			,240	759,365	,810	,013	,056	-,097	,123
16 - 8. WBC Using equipment I do not have in my country	Equal variances assumed	15,196	,000	8,919	762	,000	,859	,096	,670	1,048
	Equal variances not assumed			9,001	760,563	,000	,859	,095	,671	1,046
16 - 9. WBC Government financial incentives for international cooperation	Equal variances assumed	5,868	,016	2,101	753	,036	,185	,088	,012	,357
	Equal variances not assumed			2,110	752,768	,035	,185	,088	,013	,357
16 - 10. WBC Publishing new scientific papers	Equal variances assumed	,539	,463	2,718	764	,007	,210	,077	,058	,362
	Equal variances not assumed			2,734	763,814	,006	,210	,077	,059	,361
16 - 11. WBC Producing new patents/licenses or commercial results	Equal variances assumed	,508	,476	3,422	734	,001	,334	,098	,142	,525
	Equal variances not assumed			3,435	728,025	,001	,334	,097	,143	,524
16 - 12. WBC Professional prestige in the research community	Equal variances assumed	1,502	,221	2,919	766	,004	,233	,080	,076	,390
	Equal variances not assumed			2,920	756,495	,004	,233	,080	,076	,390
16 - 13. WBC Enable mobility of PhD students	Equal variances assumed	8,215	,004	3,208	759	,001	,280	,087	,109	,452
	Equal variances not assumed			3,225	758,887	,001	,280	,087	,110	,451
16 - 14. WBC Enable my own international mobility	Equal variances assumed	16,037	,000	3,895	766	,000	,319	,082	,158	,480
	Equal variances not assumed			3,912	765,994	,000	,319	,082	,159	,479
16 - 15. WBC Professional challenge	Equal variances assumed	1,051	,306	3,163	764	,002	,235	,074	,089	,381
	Equal variances not assumed			3,180	763,776	,002	,235	,074	,090	,380

Table 4. Number of bilateral projects between WBC&T and most frequent MS countries

	Slovenia	Austria	Italy	France
Albania	1	1	4	1
Croatia	17	10	1	1
FYR Macedonia	7	1	2	
Montenegro	3	1	2	1
Serbia	9	2	1	6
Bosnia and Herzegovina	2		2	
Turkey			2	
TOTAL	39	15	14	9

Table 5. Intensity of cooperation

grupirane WBC i MS * intensity of cooperation index Crosstabulation

			intensity of cooperation index								Total
			,00	1,00	2,00	3,00	4,00	5,00	6,00	7,00	
grupirane WE i MS	WBCcoun	Count	117	46	10	95	74	29	7	1	379
		% within grupiran WBC i MS	30,9%	12,1%	2,6%	25,1%	19,5%	7,7%	1,8%	,3%	100,0%
		% within intensity cooperation inde	67,2%	44,7%	50,0%	40,1%	36,5%	52,7%	46,7%	50,0%	46,8%
		% of Total	14,5%	5,7%	1,2%	11,7%	9,1%	3,6%	,9%	,1%	46,8%
	MScountry	Count	57	57	10	142	129	26	8	1	430
		% within grupiran WBC i MS	13,3%	13,3%	2,3%	33,0%	30,0%	6,0%	1,9%	,2%	100,0%
		% within intensity cooperation inde	32,8%	55,3%	50,0%	59,9%	63,5%	47,3%	53,3%	50,0%	53,2%
		% of Total	7,0%	7,0%	1,2%	17,6%	15,9%	3,2%	1,0%	,1%	53,2%
Total		Count	174	103	20	237	203	55	15	2	809
		% within grupiran WBC i MS	21,5%	12,7%	2,5%	29,3%	25,1%	6,8%	1,9%	,2%	100,0%
		% within intensity cooperation inde	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
		% of Total	21,5%	12,7%	2,5%	29,3%	25,1%	6,8%	1,9%	,2%	100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	43,274[a]	7	,000
Likelihood Ratio	43,783	7	,000
Linear-by-Linear Association	22,821	1	,000
N of Valid Cases	809		

a. 2 cells (12,5%) have expected count less than 5. The minimum expected count is ,94.

Table 6. T-test for equality of means for administrative barriers between WBC&T and MS in the EU FP

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
18 - 15. FP Communication problems with the partners	Equal variances assumed	,126	,723	-,054	779	,957	-,005	,091	-,183	,173
	Equal variances not assumed			-,054	753,729	,957	-,005	,091	-,183	,174
18 - 14. FP Time to response to various technical questions from EU or national administration	Equal variances assumed	6,599	,010	3,920	759	,000	,316	,081	,158	,474
	Equal variances not assumed			3,942	755,752	,000	,316	,080	,159	,473
18 - 13. FP Duration of project evaluation	Equal variances assumed	,067	,796	1,942	781	,053	,160	,083	-,002	,322
	Equal variances not assumed			1,941	766,454	,053	,160	,083	-,002	,322
18 - 12. FP Changes in project objectives, deliverables, budget or partners	Equal variances assumed	2,139	,144	3,086	760	,002	,249	,081	,091	,408
	Equal variances not assumed			3,091	749,469	,002	,249	,081	,091	,407
18 - 11. FP Co-financial obligation of my institution	Equal variances assumed	1,286	,257	2,504	768	,012	,197	,079	,043	,351
	Equal variances not assumed			2,517	766,212	,012	,197	,078	,043	,350
18 - 10. FP Payment delays by funding organisation	Equal variances assumed	2,753	,097	,518	760	,604	,043	,083	-,120	,206
	Equal variances not assumed			,521	754,887	,602	,043	,083	-,119	,205
18 - 9. FP Constant changes in rules and procedures of project submission and	Equal variances assumed	8,901	,003	3,026	773	,003	,249	,082	,087	,410
	Equal variances not assumed			3,043	771,441	,002	,249	,082	,088	,409
18 - 8. FP Differences in legal status of R&D institutions	Equal variances assumed	4,465	,035	6,326	754	,000	,564	,089	,389	,739
	Equal variances not assumed			6,308	731,430	,000	,564	,089	,389	,740
18 - 7. FP Differences in tax regimes	Equal variances assumed	9,758	,002	5,080	747	,000	,459	,090	,281	,636
	Equal variances not assumed			5,056	717,748	,000	,459	,091	,281	,637
18 - 6. FP Accounting and financial rules	Equal variances assumed	,094	,759	3,751	786	,000	,267	,071	,127	,406
	Equal variances not assumed			3,765	783,025	,000	,267	,071	,128	,406
18 - 5. FP Too big invested efforts in project preparation compared to small acceptance rate	Equal variances assumed	,227	,634	-,425	784	,671	-,028	,066	-,157	,101
	Equal variances not assumed			-,424	762,271	,672	-,028	,066	-,157	,101
18 - 4. FP Technical knowledge on how to submit project proposal (e.g. on-line submission)	Equal variances assumed	3,415	,065	4,589	797	,000	,438	,096	,251	,626
	Equal variances not assumed			4,594	788,351	,000	,438	,095	,251	,626
18 - 3. FP Understanding the application procedures	Equal variances assumed	,135	,714	3,140	796	,002	,264	,084	,099	,429
	Equal variances not assumed			3,140	784,241	,002	,264	,084	,099	,429
18 - 2. FP Finding out appropriate partner / building consortium	Equal variances assumed	,393	,531	2,442	796	,015	,171	,070	,034	,309
	Equal variances not assumed			2,454	794,714	,014	,171	,070	,034	,308
18 - 1. FP Finding out appropriate call or framework for cooperation	Equal variances assumed	5,586	,018	2,129	781	,034	,177	,083	,014	,339
	Equal variances not assumed			2,140	780,372	,033	,177	,083	,015	,339

Table 7. T-test of equality of means for institutional barriers at the national level between WBC&T and MS in the EU FP

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
20 - 7. FP We are suffering from parochialism - low national openness to the international collaboratio	Equal variances assumed	.367	.545	8.839	807	.000	.724	.082	.564	.885
	Equal variances not assumed			8.809	781.702	.000	.724	.082	.563	.886
20 - 6. FP My country ha low overall international reputation and scientific Ã¢â‚¬Å“imageÃ¢â‚¬ï¿½	Equal variances assumed	.035	.852	13.208	807	.000	1.073	.081	.914	1.233
	Equal variances not assumed			13.203	793.295	.000	1.073	.081	.914	1.233
20 - 5. FP Lobbying skill of my country at the leve of EU administration (with other national	Equal variances assumed	25.175	.000	7.789	807	.000	.617	.079	.461	.772
	Equal variances not assumed			7.865	806.404	.000	.617	.078	.463	.771
20 - 4. FP There are difficulties with researcherÃ¢â‚¬â„¢s mobility exchange (legal	Equal variances assumed	.034	.853	11.076	807	.000	.855	.077	.703	1.006
	Equal variances not assumed			11.062	790.095	.000	.855	.077	.703	1.006
20 - 3. FP National economy and technology do not benefit from international cooperation	Equal variances assumed	12.141	.001	6.672	804	.000	.524	.079	.370	.678
	Equal variances not assumed			6.628	763.826	.000	.524	.079	.369	.679
20 - 2. FP We are lackin industrial partners and companies for research cooperation	Equal variances assumed	10.265	.001	7.205	805	.000	.613	.085	.446	.780
	Equal variances not assumed			7.246	803.822	.000	.613	.085	.447	.779
20 - 1. FP International cooperation is not recognised as a formal criteria for scientific	Equal variances assumed	16.315	.000	5.492	805	.000	.490	.089	.315	.666
	Equal variances not assumed			5.455	763.542	.000	.490	.090	.314	.667

Table 8. T-test for equality of means for institutional barriers at the level or research organisation between WBC&T and MS in the EU FP

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
19 - 1. FP International cooperation is not of strategic interest to my institution	Equal variances assumed	7.659	.006	2.759	805	.006	.207	.075	.060	.354
	Equal variances not assumed			2.733	749.598	.006	.207	.076	.058	.355
19 - 2. FP Leadership is not engaged in finding appropriate call, scientific partners or niches	Equal variances assumed	2.829	.093	4.687	805	.000	.404	.086	.235	.574
	Equal variances not assumed			4.667	775.143	.000	.404	.087	.234	.574
19 - 3. FP My institution does not provide adequate professional and advisory support to	Equal variances assumed	.327	.568	4.228	805	.000	.403	.095	.216	.590
	Equal variances not assumed			4.218	784.382	.000	.403	.096	.215	.590
19 - 4. FP My institution lacks skilled accounting professionals for FP or bilateral projects	Equal variances assumed	1.061	.303	7.978	805	.000	.757	.095	.571	.943
	Equal variances not assumed			7.958	783.447	.000	.757	.095	.570	.943
19 - 5. FP My institution does not provide adequate professional assistance in project	Equal variances assumed	.135	.713	5.191	805	.000	.493	.095	.307	.680
	Equal variances not assumed			5.181	785.530	.000	.493	.095	.306	.680
19 - 6. FP There is a lack of competent collaborators at my institution	Equal variances assumed	17.008	.000	6.268	807	.000	.523	.083	.359	.687
	Equal variances not assumed			6.225	764.392	.000	.523	.084	.358	.688
19 - 7. FP Occupation with other priorities within institution (e.g. teaching activities) taking scientists	Equal variances assumed	.108	.742	4.077	807	.000	.362	.089	.188	.536
	Equal variances not assumed			4.078	794.960	.000	.362	.089	.188	.536
19 - 8. FP Financial gain from international cooperation for my institution is negligible	Equal variances assumed	.242	.623	3.105	807	.002	.254	.082	.094	.415
	Equal variances not assumed			3.104	793.214	.002	.254	.082	.093	.415
19 - 9. FP Financial gain for me and my research team is negligible	Equal variances assumed	.033	.855	3.099	807	.002	.263	.085	.096	.430
	Equal variances not assumed			3.100	794.943	.002	.263	.085	.096	.430
19 - 10. FP We are lacking adequate research equipment	Equal variances assumed	27.135	.000	11.786	807	.000	.973	.083	.811	1.135
	Equal variances not assumed			11.671	748.176	.000	.973	.083	.809	1.136
19 - 11. FP There are low information and communication technology (ICT)	Equal variances assumed	42.243	.000	6.837	807	.000	.552	.081	.393	.710
	Equal variances not assumed			6.747	726.264	.000	.552	.082	.391	.712

Table 9. T-test for equality of means for scientific excellence barriers between WBC&T and MS in the EU FP

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
21 - 1. FP My personal scientific status is not high enough for my participation in international research projects	Equal variances assumed	,838	,360	3,169	806	,002	,210	,066	,080	,340
	Equal variances not assumed			3,146	761,288	,002	,210	,067	,079	,341
21 - 2. FP My currently established networking and personal contacts in the international scientific networks are not sufficient for my participation in international research projects	Equal variances assumed	35,483	,000	4,610	806	,000	,357	,077	,205	,509
	Equal variances not assumed			4,566	748,300	,000	,357	,078	,203	,510
21 - 3. FP My institution's competitive status at the international	Equal variances assumed	11,937	,001	8,262	806	,000	,655	,079	,500	,811
	Equal variances not assumed			8,221	773,592	,000	,655	,080	,499	,812
21 - 4. FP In my country we are lacking internationally recognised scientists	Equal variances assumed	54,476	,000	12,727	806	,000	,968	,076	,819	1,117
	Equal variances not assumed			12,533	709,992	,000	,968	,077	,816	1,120

Table 10. T-test for equality of means for personal barriers between WBC&T and MS in the EU FP

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
17 - 1. FP My age	Equal variances assumed	2.569	.109	1.582	786	.114	.137	.087	-.033	.307
	Equal variances not assumed			1.576	758.899	.115	.137	.087	-.034	.307
17 - 1. WBC My age	Equal variances assumed	.378	.539	1.440	769	.150	.123	.085	-.045	.291
	Equal variances not assumed			1.438	755.991	.151	.123	.085	-.045	.291
17 - 2. FP My gender	Equal variances assumed	.506	.477	-.004	784	.997	.000	.067	-.132	.131
	Equal variances not assumed			-.004	771.820	.997	.000	.067	-.132	.131
17 - 2. WBC My gender	Equal variances assumed	3.891	.049	-.357	765	.721	-.025	.070	-.162	.112
	Equal variances not assumed			-.358	763.639	.720	-.025	.070	-.162	.112
17 - 3. FP My health condition	Equal variances assumed	.847	.358	.942	784	.346	.085	.090	-.092	.262
	Equal variances not assumed			.939	759.136	.348	.085	.091	-.093	.263
17 - 3. WBC My health condition	Equal variances assumed	.282	.595	.210	765	.834	.019	.091	-.160	.199
	Equal variances not assumed			.210	754.333	.834	.019	.091	-.160	.199
17 - 4. FP My language skills	Equal variances assumed	9.449	.002	1.059	797	.290	.116	.109	-.099	.331
	Equal variances not assumed			1.053	766.699	.292	.116	.110	-.100	.332
17 - 4. WBC My language skills	Equal variances assumed	8.623	.003	-1.624	776	.105	-.176	.108	-.389	.037
	Equal variances not assumed			-1.619	756.152	.106	-.176	.109	-.389	.037
17 - 6. FP Unforseen difficulties related to international cooperation	Equal variances assumed	.859	.354	4.930	718	.000	.459	.093	.276	.641
	Equal variances not assumed			4.920	697.097	.000	.459	.093	.276	.642
17 - 6. WBC Unforseen difficulties related to international cooperation	Equal variances assumed	3.570	.059	3.157	703	.002	.302	.096	.114	.489
	Equal variances not assumed			3.147	684.143	.002	.302	.096	.113	.490

Table 11. Factor analysis of barriers: Total variance explained

Table 11. Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7,808	22,308	22,308	7,808	22,308	22,308	4,209	12,027	12,027
2	4,680	13,371	35,679	4,680	13,371	35,679	3,610	10,314	22,340
3	2,092	5,978	41,657	2,092	5,978	41,657	3,069	8,767	31,108
4	1,684	4,813	46,470	1,684	4,813	46,470	2,481	7,089	38,197
5	1,567	4,477	50,947	1,567	4,477	50,947	2,269	6,484	44,681
6	1,395	3,986	54,934	1,395	3,986	54,934	1,943	5,553	50,234
7	1,267	3,619	58,553	1,267	3,619	58,553	1,731	4,945	55,179
8	1,120	3,199	61,752	1,120	3,199	61,752	1,724	4,925	60,103
9	1,073	3,066	64,819	1,073	3,066	64,819	1,650	4,715	64,819
10	,904	2,583	67,401						
11	,825	2,357	69,758						
12	,763	2,179	71,937						
13	,692	1,978	73,915						
14	,663	1,894	75,809						
15	,609	1,739	77,548						
16	,586	1,674	79,222						
17	,555	1,587	80,809						
18	,550	1,570	82,379						
19	,532	1,519	83,898						
20	,507	1,448	85,346						
21	,481	1,373	86,719						
22	,468	1,337	88,056						
23	,427	1,219	89,275						
24	,424	1,211	90,487						
25	,387	1,107	91,594						
26	,381	1,089	92,683						
27	,363	1,036	93,719						
28	,344	,983	94,702						
29	,316	,902	95,604						
30	,309	,883	96,487						

Extraction Method: Principal Component Analys

31	,279	,798	97,285						
32	,263	,751	98,036						
33	,249	,713	98,749						
34	,234	,668	99,416						
35	,204	,584	100,000						

Table 12. T-test for scales of all six types of barriers

Scale 1: Administrative barriers		**Cronbach's Alpha**
Payment delays by funding organisation Constant changes in rules and procedures of project submission and monitoring Differences in legal status of R&D institutions Differences in tax regimes Changes in project objectives, deliverables, budget or partners Duration of project evaluation Co-financial obligation of my institution Time to response to various technical questions from EU or national administration		.871
Scale:	**Mean**	**N**
Administrative barriers	3,6349	803
WBC answers	**3,7876**	377
MS answers	**3,4997**	426
T-test (Level of significance, Sig. 2-tailed)	**,000**	

Scale 2: Institutional support		**Cronbach's Alpha**
My institution does not provide adequate professional and advisory support to international cooperation My institution does not provide adequate professional assistance in project managing My institution lacks skilled accounting professionals for FP or bilateral projects Leadership is not engaged in finding appropriate call, scientific partners or niches There is a lack of competent collaborators at my institution		.871
Scale:	**Mean**	**N**
Institutional support	2,7125	809
WBC answers	**2,9884**	379
MS answers	**2,4693**	430
T-test (Level of significance, Sig. 2-tailed)	**,000**	

Scale 3: Project management	**Cronbach's Alpha**
Finding out appropriate call or framework for cooperation Finding out appropriate partner / building consortium	.794

Understanding the application procedures Technical knowledge on how to submit project proposal (e.g. on-line submission)		
Scale:	**Mean**	**N**
Project management	3,8917	802
WBC answers	**4,0348**	376
MS answers	**3,7655**	426
T-test (Level of significance, Sig. 2-tailed)	**,000**	

Scale4 : National scientific capacity		**Cronbach's Alpha**
My country has low overall international reputation and scientific "image" We are suffering from parochialism - low national openness to the international collaboration Lobbying skills of my country at the level of EU administration (with other national governments) are rather low There are difficulties with researcher's mobility exchange (legal rules and procedures)		.772
Scale:	**Mean**	**N**
National scientific capacity	2,9904	809
WBC answers	**3,4248**	379
MS answers	**2,6076**	430
T-test (Level of significance, Sig. 2-tailed)	**,000**	

Scale 5: Financial gain		**Cronbach's Alpha**
Financial gain for me and my research team is negligible Financial gain from international cooperation for my institution is negligible		.808
Scale:	**Mean**	**N**
Financial gain	2,5828	809
WBC answers	**2,7203**	379
MS answers	**2,4616**	430
T-test (Level of significance, Sig. 2-tailed)	**,001**	

Scale 6: Personal competitiveness		**Cronbach's Alpha**
My currently established networking and personal contacts in the international scientific networks are not sufficient for my participation in international research projects My personal scientific status is not high enough for my participation in international research projects		.696
Scale:	**Mean**	**N**
Personal competitiveness	2,000	808
WBC answers	**2,1504**	379
MS answers	**1,8671**	429
T-test (Level of significance, Sig. 2-tailed)	**,000**	

Table 13: T-test for scales of socio-cultural and political barriers

Scale 1 : v22i1(+7,5,15) **Political instability**			**Cronbach's Alpha**
Political instability in the region hinder cooperation with WBC Political antagonism within WBC reduce research cooperation among WBC Democratic deficits of some WBC diminish research cooperation			.703
Scale:	**Mean**	**N**	
v22i1(+7,5,15) Socio-cultural & political barriers	3,1195	809	
WBC answers	3,0836	379	
MS answers	3,1512	430	
T-test (Level of significance, Sig. 2-tailed)	**,244**		

Scale 2: v22i3(+9,10) **EU scientific superiority**			**Cronbach's Alpha**
EU should heavily invests in science of WBC to overcome their lagging behind EU EU 27 look down on scientific potentials of WBC			.600
Scale:	**Mean**	**N**	
Scale: v22i3(+9,10) Socio-cultural & political barriers	3,3622	809	
WBC answers	**3,5726**	379	
MS answers	**3,1767**	430	
T-test (Level of significance, Sig. 2-tailed)	**,000**		

Table 14. Difference in perception of types of barriers according to index of intensity of cooperation

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
FP technical barriers max reduced v18+10,9,8,7,12,13,11,14	,00	173	3,7742	,77807	,05916	3,6574	3,8909	1,29	5,00
	1,00	102	3,5805	,86755	,08590	3,4101	3,7509	1,00	5,00
	2,00	20	3,2182	,73862	,16516	2,8725	3,5638	2,00	4,83
	3,00	235	3,5155	,81718	,05331	3,4105	3,6206	1,00	5,00
	4,00	202	3,6823	,86162	,06062	3,5627	3,8018	1,00	5,00
	5,00	55	3,7679	,92614	,12488	3,5176	4,0183	1,00	5,00
	6,00	14	3,5690	1,15088	,30759	2,9045	4,2335	1,63	4,88
	7,00	2	4,5625	,26517	,18750	2,1801	6,9449	4,38	4,75
	Total	803	3,6349	,84547	,02984	3,5763	3,6934	1,00	5,00
FP institutional support max reduced v19+3,5,4,2,6	,00	174	2,8253	1,04281	,07906	2,6693	2,9813	1,00	5,00
	1,00	103	2,4835	1,15011	,11332	2,2587	2,7083	1,00	5,00
	2,00	20	2,8500	1,15690	,25869	2,3086	3,3914	1,00	4,60
	3,00	237	2,6118	1,05695	,06866	2,4766	2,7471	1,00	5,00
	4,00	203	2,8059	1,05058	,07374	2,6605	2,9513	1,00	5,00
	5,00	55	2,6436	1,01958	,13748	2,3680	2,9193	1,00	4,40
	6,00	15	3,3067	1,11321	,28743	2,6902	3,9231	1,40	5,00
	7,00	2	3,2000	,28284	,20000	,6588	5,7412	3,00	3,40
	Total	809	2,7125	1,07102	,03766	2,6386	2,7864	1,00	5,00
FP project management max reduced v18+1,2,3,4	,00	171	4,0595	,76976	,05886	3,9433	4,1757	1,75	5,00
	1,00	102	3,8448	1,00877	,09988	3,6466	4,0429	1,00	5,00
	2,00	20	3,9292	,69526	,15547	3,6038	4,2546	2,67	5,00
	3,00	235	3,7911	,96183	,06274	3,6675	3,9147	1,00	5,00
	4,00	203	3,8957	,95922	,06732	3,7630	4,0285	1,00	5,00
	5,00	55	3,9727	,98210	,13243	3,7072	4,2382	1,00	5,00
	6,00	14	3,5357	1,33682	,35728	2,7639	4,3076	1,00	5,00
	7,00	2	3,2500	,70711	,50000	-3,1031	9,6031	2,75	3,75
	Total	802	3,8917	,93567	,03304	3,8269	3,9566	1,00	5,00
FP national scientific capacities max reduced v20+6,7,5,4	,00	174	3,1796	,88810	,06733	3,0467	3,3125	1,00	5,00
	1,00	103	2,9320	,95435	,09403	2,7455	3,1186	1,00	5,00
	2,00	20	2,9000	,92267	,20631	2,4682	3,3318	1,25	4,75
	3,00	237	2,9188	,90928	,05906	2,8024	3,0351	1,00	5,00
	4,00	203	2,9495	,95549	,06706	2,8173	3,0817	1,00	5,00
	5,00	55	2,9545	,96955	,13073	2,6924	3,2167	1,00	4,75
	6,00	15	3,0000	,96362	,24881	2,4664	3,5336	1,50	4,75
	7,00	2	4,0000	1,06066	,75000	-5,5297	13,5297	3,25	4,75
	Total	809	2,9904	,93101	,03273	2,9262	3,0547	1,00	5,00
FP personal competitivnes max reduced v21+2,1	,00	174	2,4684	,96941	,07349	2,3233	2,6134	1,00	5,00
	1,00	103	2,0388	,82155	,08095	1,8783	2,1994	1,00	4,00
	2,00	20	2,1000	,73628	,16464	1,7554	2,4446	1,00	3,50
	3,00	236	1,8686	,81978	,05336	1,7635	1,9738	1,00	5,00
	4,00	203	1,8596	,90993	,06386	1,7337	1,9855	1,00	5,00
	5,00	55	1,5818	,67880	,09153	1,3983	1,7653	1,00	3,50
	6,00	15	1,6333	,74322	,19190	1,2217	2,0449	1,00	3,00
	7,00	2	2,2500	,35355	,25000	-,9266	5,4266	2,00	2,50
	Total	808	2,0000	,90298	,03177	1,9376	2,0624	1,00	5,00
FP financial gain max reduced v19+9,8	,00	174	2,6868	1,12301	,08514	2,5187	2,8548	1,00	5,00
	1,00	103	2,3786	1,01572	,10008	2,1801	2,5772	1,00	5,00
	2,00	20	2,8250	1,21693	,27211	2,2555	3,3945	1,00	5,00
	3,00	237	2,4895	1,07005	,06951	2,3525	2,6264	1,00	5,00
	4,00	203	2,6034	1,06434	,07470	2,4562	2,7507	1,00	5,00
	5,00	55	2,6455	1,12494	,15169	2,3413	2,9496	1,00	5,00
	6,00	15	3,3667	1,24595	,32170	2,6767	4,0566	1,50	5,00
	7,00	2	3,0000	,00000	,00000	3,0000	3,0000	3,00	3,00
	Total	809	2,5828	1,08998	,03832	2,5076	2,6580	1,00	5,00

Table 15. Difference in perception of types of barriers according to index of intensity of cooperation

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
FP technical barriers max reduced v18+10,9,8,7,12,13,11,14	Between Groups	13,688	7	1,955	2,778	,007
	Within Groups	559,600	795	,704		
	Total	573,288	802			
FP institutional support max reduced v19+3,5,4,2,6	Between Groups	18,199	7	2,600	2,292	,026
	Within Groups	908,645	801	1,134		
	Total	926,844	808			
FP project management max reduced v18+1,2,3,4	Between Groups	10,404	7	1,486	1,708	,104
	Within Groups	690,848	794	,870		
	Total	701,251	801			
FP national scientific capacities max reduced v20+6,7,5,4	Between Groups	10,409	7	1,487	1,726	,100
	Within Groups	689,955	801	,861		
	Total	700,363	808			
FP personal competitivnes max reduced v21+2,1	Between Groups	58,362	7	8,337	11,123	,000
	Within Groups	599,638	800	,750		
	Total	658,000	807			
FP financial gain max reduced v19+9,8	Between Groups	19,280	7	2,754	2,345	,022
	Within Groups	940,671	801	1,174		
	Total	959,951	808			

Table 16: Difference in perception f socio-cultural and political barriers and intensity of cooperation

Descriptives

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
Political instability	,00	173	3,0559	,83145	,06321	2,9311	3,1807	1,00	5,00
	1,00	103	3,2104	,85430	,08418	3,0434	3,3773	1,00	5,00
	2,00	20	3,1333	,68740	,15371	2,8116	3,4550	2,00	4,33
	3,00	237	3,0999	,74716	,04853	3,0042	3,1955	1,00	4,67
	4,00	203	3,1987	,80389	,05642	3,0874	3,3099	1,00	5,00
	5,00	55	3,0606	,91420	,12327	2,8135	3,3077	1,00	5,00
	6,00	15	2,8222	,96664	,24959	2,2869	3,3575	1,33	4,67
	7,00	2	3,5000	,70711	,50000	-2,8531	9,8531	3,00	4,00
	Total	808	3,1233	,80890	,02846	3,0675	3,1792	1,00	5,00
EU scientific superiority	,00	173	3,4046	,82185	,06248	3,2813	3,5280	1,00	5,00
	1,00	103	3,3204	,81003	,07981	3,1621	3,4787	1,00	5,00
	2,00	20	3,4750	,59549	,13316	3,1963	3,7537	2,00	4,50
	3,00	237	3,2722	,79776	,05182	3,1701	3,3742	1,00	5,00
	4,00	203	3,4433	,81477	,05719	3,3306	3,5561	1,00	5,00
	5,00	55	3,3636	,85231	,11493	3,1332	3,5940	2,00	5,00
	6,00	15	3,5000	,73193	,18898	3,0947	3,9053	2,50	5,00
	7,00	2	3,7500	,35355	,25000	,5734	6,9266	3,50	4,00
	Total	808	3,3663	,80700	,02839	3,3106	3,4221	1,00	5,00

Table 17. Difference in perception f socio-cultural and political barriers and intensity of cooperation

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Political instability	Between Groups	4,713	7	,673	1,029	,409
	Within Groups	523,327	800	,654		
	Total	528,039	807			
EU scientific superiority	Between Groups	4,576	7	,654	1,004	,427
	Within Groups	520,988	800	,651		
	Total	525,564	807			

Table 18. Difference in FP projects according to type of institutions

Crosstab

			type of institution of current employment						
			Other	Higher education	Public (government) institute or laboratory	Private institute	Other public research unit	Public administration	Total
type of project colaboration FP	1,00	Count	56	211	137	59	20	21	504
		% within type of project colaboration FP	11,1%	41,9%	27,2%	11,7%	4,0%	4,2%	100,0%
		% within type of institution of current employment	72,7%	54,5%	64,0%	76,6%	87,0%	67,7%	62,3%
		% of Total	6,9%	26,1%	16,9%	7,3%	2,5%	2,6%	62,3%
	2,00	Count	21	176	77	18	3	10	305
		% within type of project colaboration FP	6,9%	57,7%	25,2%	5,9%	1,0%	3,3%	100,0%
		% within type of institution of current employment	27,3%	45,5%	36,0%	23,4%	13,0%	32,3%	37,7%
		% of Total	2,6%	21,8%	9,5%	2,2%	,4%	1,2%	37,7%
Total		Count	77	387	214	77	23	31	809
		% within type of project colaboration FP	9,5%	47,8%	26,5%	9,5%	2,8%	3,8%	100,0%
		% within type of institution of current employment	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
		% of Total	9,5%	47,8%	26,5%	9,5%	2,8%	3,8%	100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	26,872[a]	5	,000
Likelihood Ratio	28,335	5	,000
Linear-by-Linear Association	7,224	1	,007
N of Valid Cases	809		

a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 8,67.

Table 19. Intensity of cooperation index and the type of institution of current employment of respondents

type of institution of current employment * intensity of cooperation index Crosstabulation

			intensity of cooperation index								
			,00	1,00	2,00	3,00	4,00	5,00	6,00	7,00	Total
type of institution of current employment	Other	Count	19	20	2	24	10	2	0	0	77
		% within type of institution of current employment	24,7%	26,0%	2,6%	31,2%	13,0%	2,6%	,0%	,0%	100,0%
		% within intensity of cooperation index	10,9%	19,4%	10,0%	10,1%	4,9%	3,6%	,0%	,0%	9,5%
		% of Total	2,3%	2,5%	,2%	3,0%	1,2%	,2%	,0%	,0%	9,5%
	Higher education	Count	92	27	6	104	110	33	14	1	387
		% within type of institution of current employment	23,8%	7,0%	1,6%	26,9%	28,4%	8,5%	3,6%	,3%	100,0%
		% within intensity of cooperation index	52,9%	26,2%	30,0%	43,9%	54,2%	60,0%	93,3%	50,0%	47,8%
		% of Total	11,4%	3,3%	,7%	12,9%	13,6%	4,1%	1,7%	,1%	47,8%
	Public (government) institute or laboratory	Count	34	31	7	60	63	17	1	1	214
		% within type of institution of current employment	15,9%	14,5%	3,3%	28,0%	29,4%	7,9%	,5%	,5%	100,0%
		% within intensity of cooperation index	19,5%	30,1%	35,0%	25,3%	31,0%	30,9%	6,7%	50,0%	26,5%
		% of Total	4,2%	3,8%	,9%	7,4%	7,8%	2,1%	,1%	,1%	26,5%
	Private institute	Count	17	11	3	34	10	2	0	0	77
		% within type of institution of current employment	22,1%	14,3%	3,9%	44,2%	13,0%	2,6%	,0%	,0%	100,0%
		% within intensity of cooperation index	9,8%	10,7%	15,0%	14,3%	4,9%	3,6%	,0%	,0%	9,5%
		% of Total	2,1%	1,4%	,4%	4,2%	1,2%	,2%	,0%	,0%	9,5%
	Other public research uni	Count	3	3	0	10	6	1	0	0	23
		% within type of institution of current employment	13,0%	13,0%	,0%	43,5%	26,1%	4,3%	,0%	,0%	100,0%
		% within intensity of cooperation index	1,7%	2,9%	,0%	4,2%	3,0%	1,8%	,0%	,0%	2,8%
		% of Total	,4%	,4%	,0%	1,2%	,7%	,1%	,0%	,0%	2,8%
	Public administration	Count	9	11	2	5	4	0	0	0	31
		% within type of institution of current employment	29,0%	35,5%	6,5%	16,1%	12,9%	,0%	,0%	,0%	100,0%
		% within intensity of cooperation index	5,2%	10,7%	10,0%	2,1%	2,0%	,0%	,0%	,0%	3,8%
		% of Total	1,1%	1,4%	,2%	,6%	,5%	,0%	,0%	,0%	3,8%
Total		Count	174	103	20	237	203	55	15	2	809
		% within type of institution of current employment	21,5%	12,7%	2,5%	29,3%	25,1%	6,8%	1,9%	,2%	100,0%
		% within intensity of cooperation index	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
		% of Total	21,5%	12,7%	2,5%	29,3%	25,1%	6,8%	1,9%	,2%	100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	54,136[a]	35	,020
Likelihood Ratio	55,375	35	,016
Linear-by-Linear Association	3,375	1	,066
N of Valid Cases	379		

a. 33 cells (68,8%) have expected count less than 5. The minimum expected count is ,01.

Table 20. Intensity of cooperation index and the current position of respondents

current position: * index of intensity v8v10v10.1234 Crosstabulation

			index of intensity v8v10v10.1234								
			,00	1,00	2,00	3,00	4,00	5,00	6,00	7,00	Total
current position:	Other	Count	37	19	3	19	5	1	0	0	84
		% within current position:	44,0%	22,6%	3,6%	22,6%	6,0%	1,2%	,0%	,0%	100,0%
		% within index of intensity v8v10v10.1234	31,6%	41,3%	30,0%	20,0%	6,8%	3,4%	,0%	,0%	22,2%
		% of Total	9,8%	5,0%	,8%	5,0%	1,3%	,3%	,0%	,0%	22,2%
	Full profesor / Senior researcher	Count	30	15	2	38	39	14	3	0	141
		% within current position:	21,3%	10,6%	1,4%	27,0%	27,7%	9,9%	2,1%	,0%	100,0%
		% within index of intensity v8v10v10.1234	25,6%	32,6%	20,0%	40,0%	52,7%	48,3%	42,9%	,0%	37,2%
		% of Total	7,9%	4,0%	,5%	10,0%	10,3%	3,7%	,8%	,0%	37,2%
	Associate or assistant professor / Research fellow	Count	50	12	5	38	30	14	4	1	154
		% within current position:	32,5%	7,8%	3,2%	24,7%	19,5%	9,1%	2,6%	,6%	100,0%
		% within index of intensity v8v10v10.1234	42,7%	26,1%	50,0%	40,0%	40,5%	48,3%	57,1%	100,0%	40,6%
		% of Total	13,2%	3,2%	1,3%	10,0%	7,9%	3,7%	1,1%	,3%	40,6%
Total		Count	117	46	10	95	74	29	7	1	379
		% within current position:	30,9%	12,1%	2,6%	25,1%	19,5%	7,7%	1,8%	,3%	100,0%
		% within index of intensity v8v10v10.1234	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
		% of Total	30,9%	12,1%	2,6%	25,1%	19,5%	7,7%	1,8%	,3%	100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	43,216[a]	14	,000
Likelihood Ratio	48,828	14	,000
Linear-by-Linear Association	11,715	1	,001
N of Valid Cases	379		

a. 9 cells (37,5%) have expected count less than 5. The minimum expected count is ,22.

Table 21. Visits abroad by group of countries

10. Have you visited or stayed in the EU or WBC country for research and academic purposes in the last 10 years? * grupirane WBC i MS Crosstabulation

			grupirane WBC i MS		
			WBCcountry	MScountry	Total
10. Have you visited or stayed in the EU or WBC country for research and academic purposes in the last 10 years?	0	Count	164	117	281
		% within 10. Have you visited or stayed in the EU or WBC country for research and academic purposes in the last 10 years?	58,4%	41,6%	100,0%
		% within grupirane WBC i MS	43,3%	27,2%	34,7%
		% of Total	20,3%	14,5%	34,7%
	Yes	Count	215	313	528
		% within 10. Have you visited or stayed in the EU or WBC country for research and academic purposes in the last 10 years?	40,7%	59,3%	100,0%
		% within grupirane WBC i MS	56,7%	72,8%	65,3%
		% of Total	26,6%	38,7%	65,3%
Total		Count	379	430	809
		% within 10. Have you visited or stayed in the EU or WBC country for research and academic purposes in the last 10 years?	46,8%	53,2%	100,0%
		% within grupirane WBC i MS	100,0%	100,0%	100,0%
		% of Total	46,8%	53,2%	100,0%

Table 22. Countries by the longest visits/stays selected by the respondents

	No. of selection	
Germany	121	Above 100 selections
Italy	108	
UK	103	
France	82	50 - 100 selections
Spain	54	
The Netherlands	50	
Belgium	48	40 - 50 selections
Slovenia	45	
Croatia	45	
Austria	45	
Greece	42	
Hungary	35	20-40 selections
Serbia	34	
Sweden	28	
Czech R.	27	
Poland	25	
Romania	24	
Bulgaria	21	
Portugal	18	10-20 selections
Finland	17	
Turkey	16	
Macedonia	14	
Bosnia and Herzegovina	13	
Albania	13	
Denmark	12	
Montenegro	11	
Slovakia	10	
Ireland	9	Below 10 selections
Estonia	6	
Malta	4	
Lithuania	4	
Kosovo	4	
Luxembourg	3	
Cyprus	3	