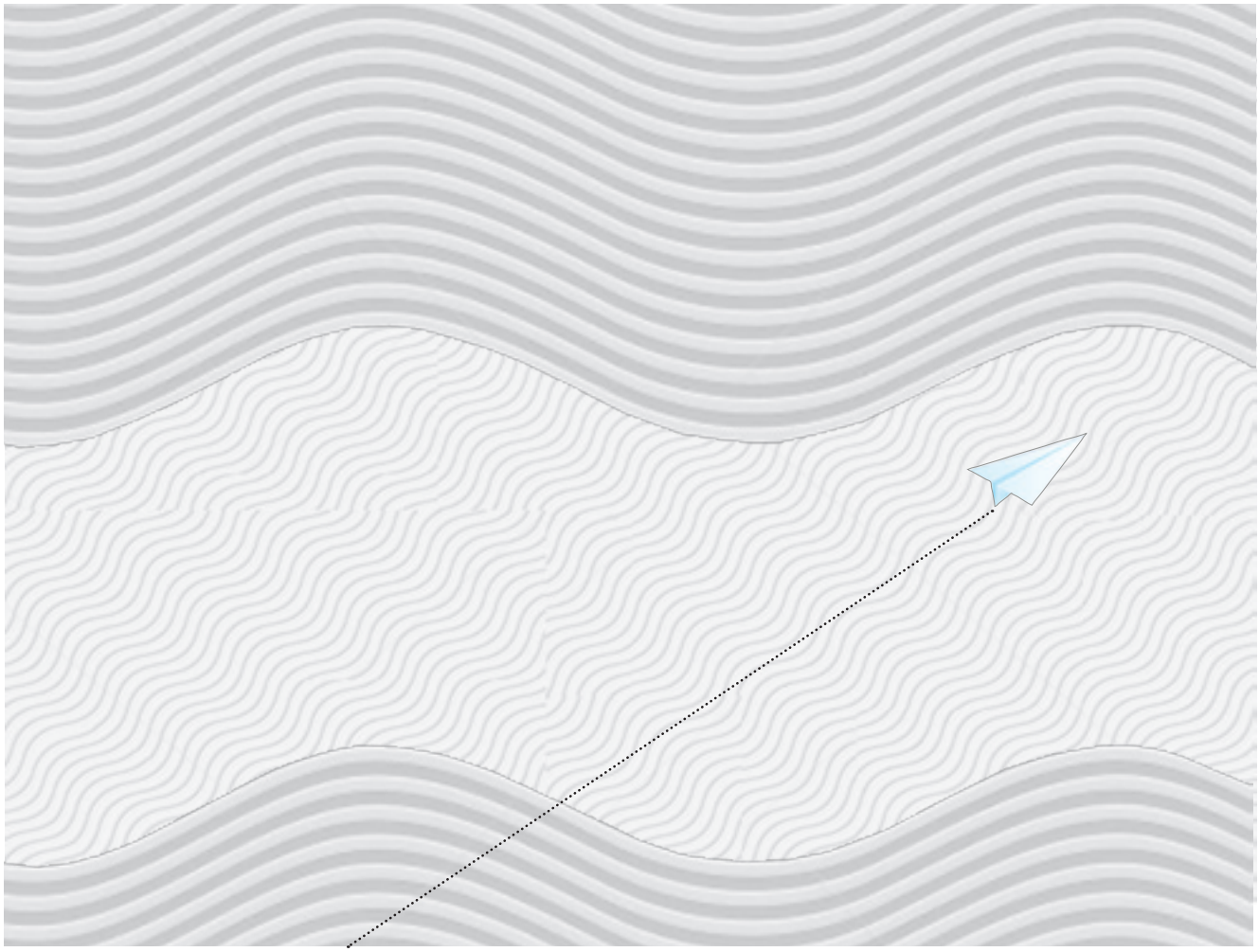
Participation of the 'New' EU Member States in the European Research Programmes — A Long Way to Go

Klaus Schuch



On start of integration into the European Research Area Central European countries faced numerous challenges related to the legacy of previous governance systems and a lack of focus on developing S&T. It was supposed that the association of these countries with the European Framework Programmes for RTD (FPs) could contribute to internal reforms provided that local scientific communities are proactive. However 15 years after the first full association the level of participation of the EU13 in FPs is still low.

The paper considers the reasons for the current state of affairs and proposes steps towards a way out.

Klaus Schuch — Director for Strategic Research, Centre for Social Innovation, Austria. Address: Linke Wienzeile 246, A-1150 Wien, Austria. E-mail: schuch@zsi.at

Keywords

framework programme; HORIZON 2020; European Union; 'new' Member States; EU-13; EU-15; co-operation; project management

Citation: Schuch K. (2014) Participation of the 'New' EU Member States in the European Research Programmes — A Long Way to Go. *Foresight-Russia*, vol. 8, no 3, pp. 6–17.

* This paper was prepared under the MIRRIS project. The project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration – SSH 2012-2 (Grant no 320209). Parts of this paper were first published online 01.07.2014 in the format of a policy brief at the Austrian ERA platform www.era.gv.at with the title 'Widening participation in European research'.

Statistics show that stakeholders from the 'new' EU member states (EU13)[1] have benefitted less in absolute terms from their participation in Europe's 7th Framework Programme for Research and Technological Development (henceforth FP7) than those from EU15[2] countries. This is not a new observation. Since the association of the former Central European Candidate Countries (all now regular EU member states) with the 5th European Framework Programme for Research and Technological Development (RTD), many have argued that within the competitive European Framework Programme for RTD, Central European cohesion countries are at risk of 'subsidising' the more competitive, mostly Western European, countries, for various reasons to do with competitiveness [CORDIS, 2002; *Havas*, 1999, 2002; *Le Masne*, 2001; *Mickiewicz, Radosevic*, 2001; *Nedeva*, 1999, *Reid et al.*, 2001].

This paper discusses the participation of the EU13 countries in European research, mainly in the European Framework Programmes for RTD. It briefly reflects on the structural challenges of the then Central European candidate countries during the transformation period in the 1990s to recall their starting points at the time when they first became associated with the European Framework Programme for RTD. Almost 15 years after the first full association with the European Framework Programme for RTD, the actual participation situation of the 'new' EU member states is analysed. Next, the European Union's measures to enhance widening participation of organizations in the ongoing European Framework Programme for RTD with the name 'HORIZON 2020' are concisely described. Finally, conclusions are drawn as to why — despite several efforts — participation of the EU13 is still low. It is argued that structural deficiencies of national innovation and research systems have to be further eliminated, that a sustainable enhancement of participation has to be based on increasing excellence adopted for the national and local context, and that smaller corrective measures like upgraded NCP systems may be necessary but not sufficient.

Structural challenges and the association of Central European Countries to the European Framework Programme for RTD

The structural challenges which the Central European Countries (CECs) faced during the 1990s were mainly caused by:

a) *the inherited institutional set-up of the communist hegemonic research system*, characterised by some basic features such as: the **Academies of Sciences** which had almost the status of ministries for science and technology and often had underdeveloped internal competitive research funding mechanisms; a **bureaucracy, centralization and compartmentalization** never shared to any comparable degree by market economies [*Biegelbauer*, 2000]; **politically dominated universities** with weak research links; domination of **military-industrial complexes** which limited a functioning technology transfer to the civil sector due to its secretive character [*Josephson*, 1994; *Gaponenko et al.*, 1995]; and **industrially oriented branch research institutes** geared towards the collapsing centralized economies of individual ministries [OECD, 1994];

b) the severe *transformation process* towards a capitalist market economy in which science and technology — despite some lip service — were not treated as a preferential policy areas in any of the relevant countries during the 1990s [*Bucar, Stare,* 2002; *Havas,* 1999, 2002; *Mickiewicz, Radosevic,* 2001].

[1] EU13 abbreviation = Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, and Slovenia.

[2] EU15 abbreviation = Austria, Belgium, Denmark, Germany, Greece, Finland, France, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the UK.

The downturn in economic activity during the first phase of the transformation process was accompanied by an accelerated winding down of research capacities [Coopers and Lybrand et al., 1999]. Partly because industry had to face the most disruptive adjustment processes, which resulted in a collapse of industrial demand for R&D, the sharp decline in applied research capabilities was greater than for basic research. Industrial R&D entities laid off between two thirds and three quarters of their R&D personnel [*Biegelbauer*, 2000]. As a consequence, the share of business expenditure on R&D (BERD) to the general expenditure on R&D (GERD) almost collapsed in most Central European transition countries. It also has to be noted that even studies on foreign direct investment (FDI)-induced knowledge spillovers in the Central European Countries produced mix results, which are often described as '*Janus shaped*' structures [*Biegelbauer et al.*, 2001]. Although foreign-owned firms did spend more on R&D in general than indigenous ones [*Inzelt*, 1999], they did not develop broad R&D capacities during the 1990s [*Biegelbauer*, 2000; *Dyker*, 1999] and the few R&D activities carried out by multinational companies in their Central European host countries were usually not closely connected to the local knowledge base [*Biegelbauer et al.*, 2001].

In addition to these problems caused by a collapsing industrial R&D during the transformation phase, the science system itself was strongly affected during the transformation process. The effects on the science system are exemplified by the following two elements: de-capitalisation of the physical research infrastructure and the ageing of the human research base. Many Central European countries (CECs) faced a de-capitalisation of the physical research infrastructure [*Schuch*, 2005]. The prevailing inferiority of the physical research infrastructure compared to Western standards was considered to be one of the most pressing structural problems in the CECs science systems. The physical research infrastructure situation improved, however, considerably with the accession of the CECs to the European Union and the transfer of structural funds. Another important issue was the human resource base, which was characterised by low salary levels for researchers, leading to both internal and external brain drain [Bulgarian Ministry of Education and Science, 2002; *Gächter*, 2001; *van der Lande*, 1998]. These developments have negatively affected the research sector's attractiveness for newcomers and contributed to the ageing of the research sector in the countries concerned.

Finally, the policy making and delivery systems were not always properly organized and, thus, negatively affected the execution of S&T policies, which was usually distributed over several ministries and had insufficient links with industrial policies and realities [*Reid et al.*, 2001]. Moreover, newly elected governments, tending to restructure the elements of their S&T systems with the stroke of a pen, provoked situations in which personal communication became difficult and even institutional memory was negatively affected [ICCR, 1997]. The incipient decentralized 'agency-fication' process in an already weak administrative environment amplified the lack of policy skills and possibilities for networking, clustering, coordination and long-term planning rather than addressing such problems [*Suurna, Kattel*, 2010].

Against this background, a need for restructuring the inherited research structure became evident. Based on the general alignment of the former Central European candidate countries' R&D priorities alongside those of the EU and with financial and technical support by the EU [*Suurna, Kattel*, 2010; *Schuch*, 2005; UNESCO, 1999, 2000], a period of institution and capacity building and structural reform began, which resulted in:

- the reform of public R&D systems including the university sector;
- the creation of research programmes of national significance;

- the availability of mostly bottom-up operated funds for applied research to stimulate R&D and innovation relevant to industry;
- the implementation and upgrading of technology transfer systems and institutions;
- the establishment of institutional infrastructure and bridging institutions to support innovation in SMEs (e.g. technology parks, business innovation centres, incubators, innovation agencies, etc.); and
- the establishment of new institutions with strategic R&D relevance such as the Zoltan Bay Institutes in Hungary or the Foundation for Polish Sciences.[3]

Most of these activities simply represented the start of what was required [*Nauwelaers, Reid,* 2002]. Some analysts even argue that some countries delivered only limited progress to restructure their NIS and elements thereafter [*Svarc,* 2006]; other scholars argue that some countries were not sufficiently responding to local needs by adequate policy experimentation but instead focused on the application of tools developed for other contexts [*Radosevic,* 2011]. In any case, the implementation of structural reform activities did not happen in isolation, but was mostly embedded in a comprehensive European integration and enlargement process involving the step-by-step adoption of the *acquis communautaire* by the former candidate countries. In addition, the EU's role in the formation of innovation policies in the CECs became significant [*Suurna, Kattel,* 2010]. After the intermediate stages had successfully been reached (such as the COST and EUREKA membership and limited participation in the European Union's 4th Framework Programme for RTD), full association with the 5th Framework Programme for RTD became the next milestone for participating in European research and the European research area [*Schuch*, 2005].

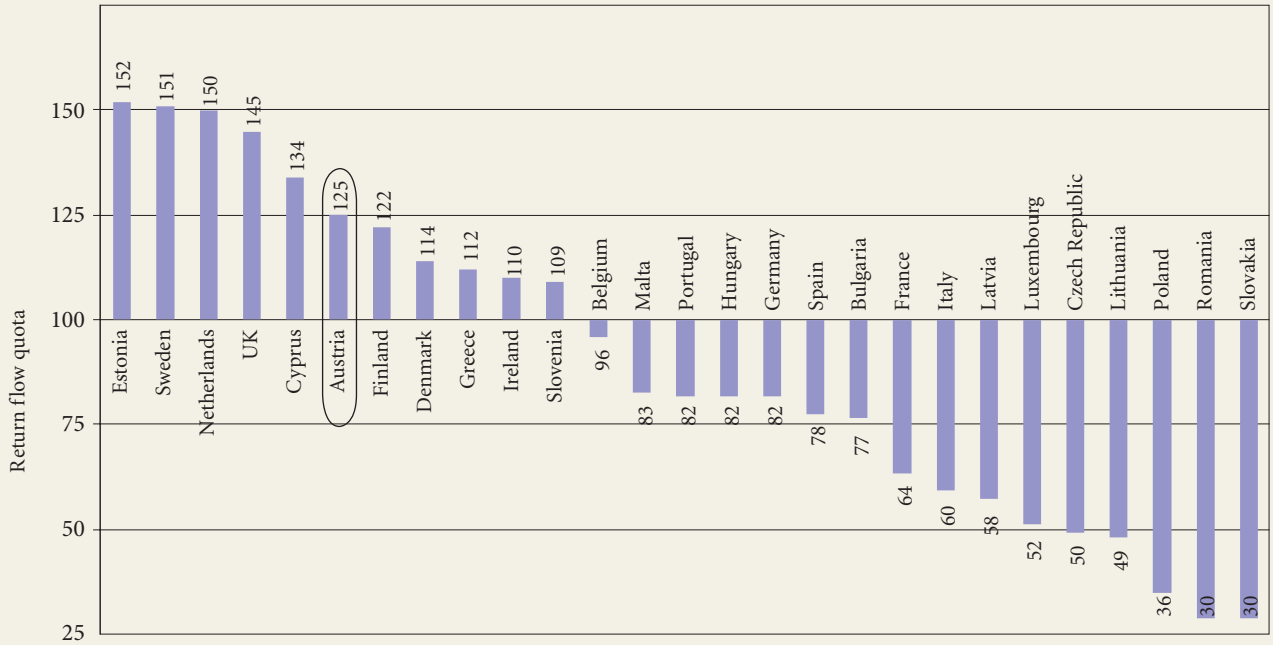
Despite the attempts at modernizing the innovation systems in these countries and introducing structural changes during the 1990s, the evaluation of the project proposals submitted under the first calls for proposals launched under FP5 in 1999 had a sobering effect on the optimists who believed that research in the Central European Countries could compete at a Western European level. The reasons why these countries came off badly in terms of successful participation in the European Framework Programmes were manifold, but were mainly rooted in structural weaknesses [*Andreff et al.,* 2000]. Analyses have shown that both the size and the quality of the economy as well as the research system influence the mobilisation of research communities to engage in FP proposals, and that 'quality' factors rather than 'size' factors have a distinctive influence on competitiveness measured in terms of success rates [*Schuch,* 2005]. GNP per capita as a proxy for a country's economic development level showed the highest influence, but other factors also proved to be highly relevant. GERD as a percentage of GDP, the proportion of researchers in the total labour force, as well as the absolute gross expenditure on R&D allocated to each individual researcher (which are all proxies for a country's research orientation) had a distinctive influence on the competitiveness of the Central European Countries under FP5 (measured in terms of success rates) [*Schuch*, 2005]. In general, economically more advanced countries tended to outperform their economically weaker neighbours in terms of European RTD competitiveness.

Participation of the 'new' EU member states in FP7

Almost 15 years later, the situation has only gradually improved. Given the importance which innovation policy has gained in the 'new' EU member states in

[3] Text taken mainly from [*Schuch,* 2005] referring to [UNESCO, 2000; Coopers and Lybrand et al., 1999; *van der Lande,* 1998].

Figure 1. **Ranking of EU Member States according to their theoretical FP7 *juste-retour* rate (%)**



Explanation: the y-axis shows the theoretical FP7 *juste-retour* ('net recipients' are above 100% and 'net contributors' below 100%). Data provided as of November 2013.

Source: [PROVISO, 2014, p. 58].

the 2000s as compared to the 1990s — as evidenced by for example, the availability of much structural funding, the adoption of innovation tools from more developed countries (facilitated by an organized community of practices, the ERAWATCH repository or STI policy mix peer reviews), and the organizational system changes implemented (such as the 'agencyfication', the adoption of the Bologna process etc.) — this might come as another sobering hiccup.

By measuring the '*juste retour*' share of a country in FP7 through its relative contribution to the EU budget – assuming that this EU budget share is also the theoretical FP7 budget share of the country – only Estonia, Cyprus and Slovenia are FP7 'net recipients' (together with the high-R&D performing countries Sweden, the Netherlands, the UK, Austria, Finland, as well as the two FP7-savvy cohesion countries, Greece and Ireland) [PROVISO, 2014]. The most affected 'net contributors' (in relative terms) are Slovakia, Romania, Poland, Lithuania and the Czech Republic (see Figure 1).

In terms of total absolute figures of successful beneficiaries, statistics also show that all EU13, with the exception of Poland, which mobilised more successful beneficiaries than Ireland and Portugal, performed poorly in comparison with EU15 countries. However, even a small country such as Austria had almost 50% more beneficiaries in FP7 than Poland, one of the largest countries in the EU. In total, ten times more EU15 organizations have been awarded FP7 funding compared to EU13 organizations. In terms of the numbers of participants, the EU13 countries Poland, Hungary and the Czech Republic together have 51% of the EU13 total.

By comparing the 'market share' of the EU13 — measured in terms of FP7 participation — with the four 'old EU' cohesion countries (i.e. Greece, Ireland, Portugal, Spain) included in the EU15, the three countries (i.e. Austria, Finland and Sweden) that joined last to form the EU15[4] and the 8 remaining EU15 countries

[4] As a reminder, the key dates of EU enlargement as of the 1980s were: 1981 — Greece; 1986 — Spain and Portugal; 1995 — Austria, Finland and Sweden; 2004 — Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia; 2007 — Bulgaria and Romania; 2013 — Croatia.

(i.e. Belgium, Denmark, France, Germany, Italy, Luxembourg, the Netherlands and the UK) across time from FP5 to FP7, one can see that the share of the EU13 has increased most but starting from a rather low level and still only amounting to roughly 10% (see Table 1).

All EU13 countries, except Slovakia, have increased their 'market share' in the European Framework Programmes from FP5 to FP7 (e.g. Poland, the country with the largest 'market share' of the EU13, has increased its market share - measured in terms of relative participation — from 1.84% in FP5 to 2.16% in FP7)[5]. The share of the EU13 within the different FP7 programmes varies considerably between 5% for the Health priority and 16% for Social Sciences and Humanities. In relative terms, the EU13 are lagging behind the EU28 average, in particular in 'Health' and 'ICT', the two most frequented and largest 'thematic programmes' in FP7.

As far as coordinators are concerned, the EU13 combined have a 'market share' (number of coordinators from EU13 as a percentage of all FP7 coordinators) of only 4.74% in FP7 (compared to 4.07% in FP5) and are therefore bottom of the league in Europe. PROVISO data show that the smallest share of coordinators in all FP7 participation by country is to be found in the Czech Republic (3.0% share of Czech coordinators out of all Czech participation in FP7), followed by Romania (3.9%), Slovenia (4.0%) and Bulgaria (4.1%) [PROVISO, 2014, p. 19]. This indicates insufficient technical and managerial coordination capacities.

According to statistics published by DG Research and Innovation on August 2013 [European Commission, 2013], no single EU12 country[6] was above the EU15 average of 21.91% in terms of success rate (compared to an average success rate of 18.48% of the EU12). Latvia, Estonia, Hungary, Lithuania and the Czech Republic were closest to the EU27 average, ahead of Spain, Luxembourg, Portugal, Italy, and Greece. Malta, Poland and Slovakia were still ahead of Italy and Greece, while Bulgaria, Slovenia, Cyprus and Romania clearly lagged behind.

By correlating the number of participations in FP7 per 1,000 researchers[7] by country, which measures the **efficiency of the national research communities in acquiring FP7 projects**, a slightly different picture emerges. We see a trend towards a negative correlation for the larger EU countries (size effect).[8] In this respect [PROVISO, 2014][9], Greece – a cohesion country – is tradition-

Table 1. **FP 'market share' development of selected country groupings from FP5 to FP7**

Country Grouping	Percentage of FP 'market share'			FP7/FP5
	FP5	FP6	FP7	
EU13	7.61	14.41	10.25	1.35
4EU15	15.59	15.20	16.70	1.07
3EU15	9.48	10.13	9.67	1.02
8EU15	67.31	60.51	63.36	0.94

Explanation: Market share is defined as the share of participation from EU MS x out of the total number of participation from all EU MS.

Source: [MIRRIS, 2014, p. 18].

[5] For comparison and positioning purposes: Austria increased its respective share from 2.88% in FP5 to 3.30% in FP7.

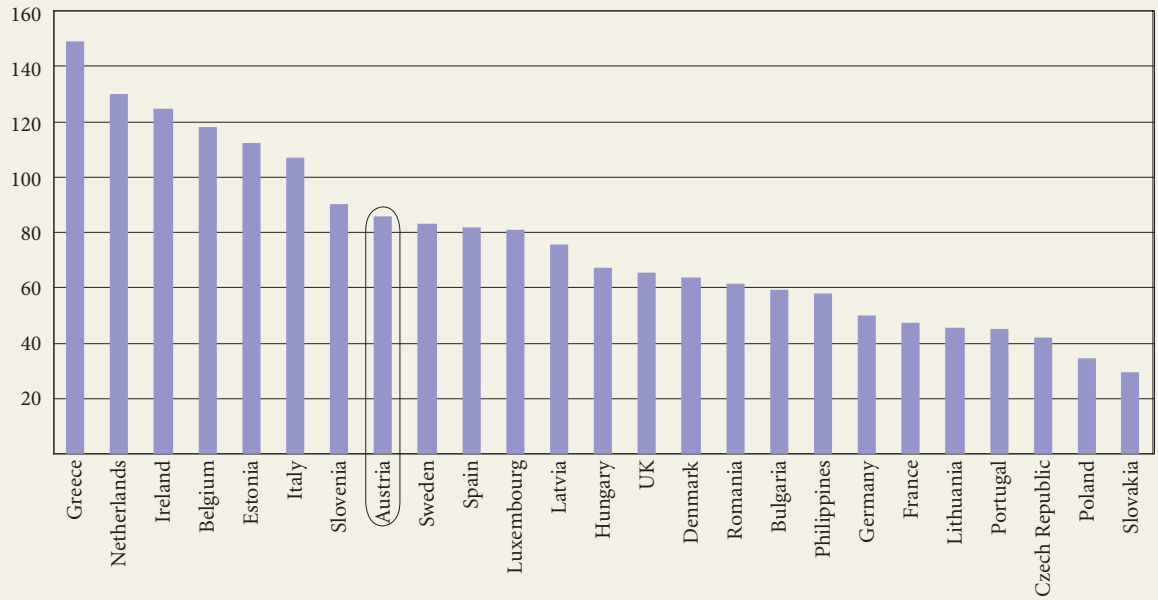
[6] EU12 = the 10 Central European Member States, plus Cyprus and Malta but without Croatia

[7] According to the Frascati Manual [OECD, 2002].

[8] This negatively correlated size effect might be due to larger domestic research markets and a more differentiated national research system. It is comparable to business-based export quotas, where smaller countries also usually show higher export quotas than large countries which have more absorptive domestic markets in scope and scale.

[9] June 2014.

Figure 2. **Number of approved FP7 participations per 1,000 researchers by country**



Source: [PROVISO, 2014, p. 16].

ally in the lead with 149.1 participations per 1,000 researchers, followed by the Netherlands and Ireland (see Figure 2). Estonia is ranked 5th and Slovenia 7th, just before Austria. Among the five 'least efficient' research communities, however, are four EU12 countries, namely Lithuania (ranked 21st), Czech Republic (ranked 23rd), Poland (24th) and Slovakia (25th). With the exception of Poland, these are countries with limited domestic (research) market sizes. This points again towards structural problems, because the 'size effect' cannot be used as a justification for these smaller countries.

The EU contribution received on an aggregated level also shows that the EU12 countries have been awarded significantly fewer funds than the EU15. Only Luxembourg — the smallest of the EU15 — did worse in absolute budgetary terms than any EU12 country, with the exception of Malta. At the applicant level, EU12 applicants receive EUR 167k per beneficiary on average, while the average for EU15 beneficiaries was EUR 340k.

EU measures to Enhance 'Widening'

Despite serious efforts deployed at the national and at European level during the last few years (especially through the use of European Regional Development Fund (ERDF) funding in the EU12 since 2004), there are still striking internal EU disparities in terms of research and innovation performance, as also identified in the Innovation Union Scoreboard. These trends are further exacerbated by the continuing severe financial crisis, and the subsequent adverse effects on public research and innovation budgets.[10]

To address these disparities, the EC has introduced a number of targeted, comparatively small, activities within the competitive framework of the European Framework Programme, such as the 'REGPOT' approach in FP7, aiming at 'unlocking and developing existing or emerging excellence in the EU's convergence and outermost regions.' HORIZON 2020 introduces further specific measures for spreading excellence and widening participation. These measures are tar-

[10] Taken from http://ec.europa.eu/programmes/horizon2020/en/h2020-section/spreading-excellence-and-widening-participation, accessed 16.06.2014.

geted at Member States[11] and countries that are associated with HORIZON 2020 and low-performing in terms of research and innovation; the measures will be implemented by the states most in need of a new cohesion policy for the 2014–2020 programming period.[12]

- The **Teaming** action (associating advanced research institutions with other institutions, agencies or regions for the creation or upgrading of existing centres of excellence) is a new feature under HORIZON 2020. It provides new growth opportunities for the involved parties, by tapping into new collaboration and development patterns, including the establishment of new scientific networks, links with local clusters and opening up access to new markets. Teaming actions offer new possibilities for exploitation and value creation for national and local research, aiming to boost the innovation potential of the countries involved.
- **Twinning** aims to strengthen a defined field of research in a knowledge institution by linking it to at least two internationally leading counterparts in Europe.
- The **ERA Chairs** scheme is designed to provide support for universities and other research institutions by attracting and maintaining high quality human resources and implementing structural changes necessary to achieve excellence on a sustainable basis.
- The **Policy Support Facility** aims to improve the design, implementation and evaluation of national/regional research and innovation policies. It offers expert advice to public authorities at the national or regional level on a voluntary basis, covering the need to access a relevant body of knowledge, benefit from the insights of international experts, use state of the art methodologies and tools, and receive tailor-made advice.

In addition, established measures from previous Framework Programmes which were not specifically designed to promote the widening agenda but which can be used for that purpose, are continued. Examples of these are **COST**, which supports access to international thematic networks, or support provided by the European Commission (EC) to **National Contact Points (NCP)**, whose administrative and operational capacities will be further strengthened to ensure a better flow of information between researchers and HORIZON 2020. An innovative example of this is the targeted COST network **BESTPRAC**[13], which aims to advance the state of the art work via excellent administration of transnational research projects by creating a network of research administrators. Several coordination and support actions also aim to overcome research and innovation disparities in the EU. An example of a support project explicitly dedicated to the widening participation agenda is **MIRRIS**[14], which aims to mobilise institutional reforms in the research and innovation systems of the EU13 by implementing a structured policy dialogue in each EU13 country. The tangible outcome of the policy dialogue should be an action plan with a roadmap, as well as a list of prioritised interventions designed to increase the participation of researchers,

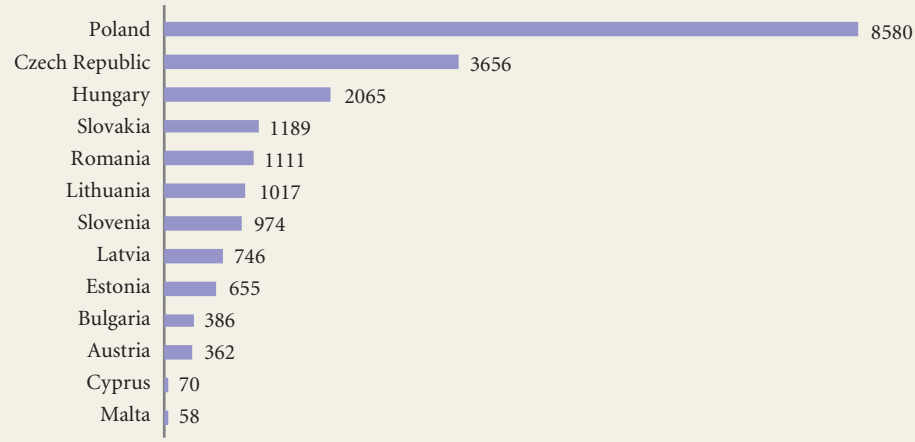
[11] As outlined in the work programme [European Commission, 2014a] applicant organizations for the 'Spreading Excellence and Widening Participation' programme of HORIZON 2020 will be organizations from Member States as well as Associated Countries ranked below 70% of the EU27 average of a composite indicator on Research Excellence, which actually defines a different set of Member States (The EU13 Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia but also Portugal and Luxembourg from the EU15) and — based on the association agreements signed so far — also Albania, Bosnia and Herzegovina, Former Yugoslav Republic of Macedonia, Moldova, Montenegro, Serbia and Turkey [European Commission, 2014b]. Research organizations from these Associated Countries (as well as Faroe Islands and Liechtenstein subject to future association agreements) are eligible to submit proposals.

[12] The following paragraphs are taken from http://cordis.europa.eu/programme/acronym/FP7-REGPOT_en.html, accessed 16.06.2014.

[13] Available at: http://www.cost.eu/about_cost/strategy/targeted_networks/bestprac, accessed 17.06.2014.

[14] Available at: http://www.mirris.eu/SitePages/default.aspx, accessed 17.06.2014.

Figure 3. **ERDF budget earmarked for R&D 2007-2013 (in million euros)**



Source: DG Research and DG Regional Policy – Cohesion Policy 2007–2013: Research and Innovation; quoted in [MIRRIS, 2014, p. 36].

research organizations and enterprises from the above-mentioned countries in HORIZON 2020 [*Schuch et al.*, 2013].

Having said that, the potentially most significant EU support measure for modernising research and innovation in the cohesion countries which can positively impact both the widening agenda and the excellence creation agenda comes from outside the Framework Programme and covers the ERDF budget earmarked for R&D. Synergies between FP and ERDF funding have been on many stakeholders' agenda for many years, but problems in strategically using or even aligning these schemes also have a long tradition. Figure 3 shows the planned[15] ERDF budget for R&D for the EU12 countries compared to Austria.

It is worth noting that countries such as Denmark, Belgium, Ireland, the Netherlands, Sweden, and also Austria have received more money from FP7 than from ERDF R&D supporting activities. Not surprisingly, all these countries belong to the best-performing countries in terms of research and innovation in Europe. On the part of the EU12, the relation between FP7 funding and ERDF funding for R&D is most imbalanced in Lithuania, Latvia, Poland, Slovakia, and the Czech Republic, the latter having the greatest divide between a high ERDF budget and a low amount of FP7 funds received. Given how high ERDF spending for R&D activities in these countries is in absolute terms, substantial increases in R&D capacities can be expected in these countries in the coming years, provided that they also manage to supply (or attract) the necessary excellent human capital.

However, some experts even argue that the comparatively 'easily' accessible, national administered, but EC co-financed, ERDF funding might — at least initially — distract the attention of universities and research institutes in the cohesion countries away from the more competitive HORIZON 2020 programme.

Conclusions and Recommendations

As evidenced by previous research [*Schuch*, 2005; *Andreef et al.*, 2000], the 'widening approach' cannot be separated from the 'excellence creation approach' because excellent organizations are needed to compete and perform successfully in HORIZON 2020. This holds true not only for the cohesion countries but also for FP frontrunners such as Austria, especially given the assumption that competition in HORIZON 2020 will become even more severe compared to the already high level of competition in FP7. This is due to austerity policies in the EU member states which also affect public R&D spending at the national level, and the increased diversion effect towards HORIZON 2020 this entails.

[15] The current final data are not yet available.

Excellence, however, is structurally and even culturally embedded in established local and national research and innovation systems [*Loudin, Schuch,* 2009; *Reith et al.,* 2006] which only change slowly and need critical mass. Moreover, 'excellence' is not an abstract, externally defined standalone category, but needs to be translated into national and local environments, absorption capacities and absorption needs. Excellence should not be confined to academic benchmarks but coupled with economic and social relevance [*Radosevic,* 2014]. One can be excellent at different levels, but the emphasis of the EU13's innovation policies in the last 15 years was highly oriented towards high-tech and over-emphasised linear linkage policies from lab to market [*Suurna, Kattel,* 2010], the results of which were meagre '*due mainly to an uncritical application of conventional policy in the context of 'catching up' and 'laggard' economies*' [*Radosevic*, 2011, p. 378].

Greenfield investments, if not properly embedded in usually complex networks, transaction and support systems, will hardly pay off in the short and medium term, if at all. Additionally, it seems essential to nurture and provide a high level of qualified human capital and provide sufficiently attractive conditions for the human capital to stay in the country; otherwise the most modern research infrastructure will generate only limited impact. According to the Times Higher Education World University Rankings 2013–2014,[16] there is not a single university from the EU13 among the top-listed 300 universities worldwide. Thus it is not surprising that to date, no EU13 university ranks among the Top 50 universities to have participated in FP7 projects, and only one EU13 research organization (Institut Jozef Stefan in Slovenia, which was involved in 114 projects) appears in the Top 50 list of research organisations that have participated in FP7 projects. In addition, only one Top 50-ranked large enterprise originates from the EU13 ('Ustav Jaderneho Vyzkumu Rez. A.S.' in the Czech Republic).

Investments in R&D and innovation, with or without ERDF, or in the future with European Structural and Investment Funds, have to be carefully conceptualized. To put more money into 'old' structures which have already underperformed in the past seems to be a waste of resources. Investments have to be accompanied by structural institutional reforms in research and innovation systems at national and local levels. When analysing the National Reform Programmes, it seems, however that EU12 countries are focussing less on the reform of their R&D activities than EU15 countries [MIRRIS, 2014].

Another approach to prepare for advanced competition at EU level, especially in HORIZON 2020, could be by participating in joint initiatives such as ERA-NETs, JPIs, JTIs and Article 185. Participation in joint initiatives can be seen as a means for international networking and co-creation and as an important step on the 'stairway to excellence'. However, participation from the EU12 in such activities remains low (see Table 3).

In the 9 JPIs for which data were available in mid-July 2013 (Table 2), only a few EU12 countries were represented in the governance of these JPIs. Two JPIs even had no participation from the EU12. In the two joint undertaking projects taken into account, only six EU12 countries are involved. The Czech Republic and Poland participate in both projects. As for the Ambient Assisted Living initiative managed under Article 185, only five EU12 countries are involved but not even each year. All EU12 are members in Eurostars, but SME participation in Eurostars is particularly low in Bulgaria and Malta compared to their SME potential [MIRRIS, 2014].

The impact of structural investments takes time, and supposed quick-fixes[17] are not sufficient. However, even within less structural but simpler short-term

[16] Available at: http://www.timeshighereducation.co.uk/world-university-rankings/2013-14/world-ranking/region/europe, accessed 19.06.2014.

[17] Such as additional remuneration (bonuses) of up to EUR 8,000 per year to be reimbursed in HORIZON 2020 projects as part of personnel costs, if this is the normal practice of an organization; this instrument is heavily in demand by the newer Member States' governments.

Table 2. **EU12 participation in FP7 joint initiatives**

Initiative	Country											
	Bulgaria	Czech Republic	Cyprus	Estonia	Hungary	Lithuania	Latvia	Malta	Poland	Romania	Slovakia	Slovenia
Alzheimer and other neurodegenerative diseases (JPND)		X			X				X		X	X
Agriculture, food security and climate change (FACCE)		X	X	X					X			X
Healthy diet for a healthy life												
Cultural heritage and global change		X	X			X			X	X	X	X
Connecting climate knowledge for Europe												
Anti-microbial resistance		X							X	X		
Healthy and productive seas and oceans							X		X	X		
More years, better lives												
Urban Europe		X	X					X				
TOTAL	0	4	3	1	1	1	1	1	5	3	2	3
Joint undertakings												
Artemis		X					X		X			X
Fuel cells and hydrogen		X				X			X	X		
Article 185 Initiative												
Ambient Assisting Living			X		X				X	X		X
Eurostars: Eureka/FP7	X	X	X	X	X	X	X	X	X	X	X	X

Source: [MIRRIS, 2014, p. 24].

awareness raising and information provision activities, a more systematic approach is often needed to help potential or strategic stakeholders access HORIZON 2020 funding. The MIRRIS project identified several actions which can inspire the EU13 to mirror their own current practices, or to develop some equivalent tools, such as:

- signposting pre-information regarding future potential calls
- awareness-raising, information and advice on accessing HORIZON 2020 funding;
- the creation of sectoral or cross-sectoral interest groups;
- the promotion of local academia-industry cooperation and their cross-border networking;
- advice and quick checks of project ideas;
- support in searching for international partners;
- grants for exploring project feasibility and validation of project ideas;
- grants to seek advice from specialized consultants;
- the provision of training to potential EU project managers;
- support for ERA-Net projects on strategic topics. These projects are excellent springboards for regional actors' participation in HORIZON 2020;
- the provision of mentoring and coaching to potential EU project partners (taken from MIRRIS, 2014).

Such activities are often performed by NCP systems. They can help to mobilise 'dormant' research communities, and perhaps upgrade a proposal from one level to the next through professional advice. Nonetheless, they can neither generate excellent ideas nor write outstanding research proposals which are needed to successfully compete in HORIZON 2020. NCP systems can neither balance structural deficiencies of national innovation and research systems, nor replace forward-looking STI policy-making. F

Andreff W., Eleftheriou A., Horvat M., Krickau-Richter L., Nolan T., Pilotti A.-M., Ribeiro da Silva N. (2000) *1999 Five-Year Assessment Related to the Specific Programme INCO*, Brussels: European Commission.

Biegelbauer P. (2000) *130 Years of Catching Up with the West. A Comparative Perspective on Hungarian Industry, Science and Technology Policy-Making since Industrialisation*, Aldershot: Ashgate.

Biegelbauer P., Griessler E., Leuthold M. (2001) *The Impact of Foreign Direct Investment on the Knowledge Base of Central and Eastern European Countries. Reihe Politikwissenschaft 77*, Vienna: Institute for Advanced Studies.

Bucar M., Stare M. (2002) Slovenian Innovation Policy: Underexploited Potential for Growth. *Journal of International Relations and Development*, vol. 5, no 4, pp. 427–448.

Bulgarian Ministry of Education and Science (2002) *Attracting Young Scientists — Strategies against Brain Drain*, Sofia: Bulgarian Ministry of Education and Science.

Coopers & Lybrand, CIRCA Group, C'EST (1999) *Impact of the Enlargement of the European Union towards the Associated Central and Eastern European Countries on RTD-Innovation and Structural Policies*, Luxembourg: Office for Official Publications of the European Commission.

CORDIS (2002) Erfolgsrate Sloweniens bei RP5-Vorschlägen in den Ländern Mittel- und Osteuropas (MOEL) am höchsten. *Cordis focus*, no 205, p. 10.

Dyker D. (1999) Foreign Direct Investment in the Former Communist World: A Key Vehicle for Technological Upgrading? *Innovation*, vol. 12, no 3, pp. 345–352.

European Commission (2013) *6th FP7 Monitoring Report*, Brussels: European Commission. Available at: http://ec.europa.eu/research/evaluations/pdf/archive/fp7_monitoring_reports/6th_fp7_monitoring_report.pdf#view%3Dfit%26pagemode%3Dnone, accessed 19.06.2014.

European Commission (2014a) *Spreading Excellence and Widening Participation. HORIZON 2020 Work Programme 2014 – 2015 Part 15 (Revised)*, Brussels: European Commission. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-sewp_en.pdf, accessed 18.07.2014.

European Commission (2014b) *Horizon 2020: Associated Countries (version 1.4), Brussels: European Commission*, Brussels: European Commission. Available at: http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/3cpart/h2020-hi-list-ac_en.pdf, accessed 18.07.2014.

Gachter A. (2001) *Return to Bulgaria* (Working Paper), Vienna: Institute for Advanced Studies.

Gaponenko N., Gokhberg L., Mindeli L. (1995) Transformation der Wissenschaft Russlands. *Tranformation mittel- und osteuropaischer Wissenschaftssysteme* (eds. R. Mayntz, U. Schimank, P. Weingart), Opladen: Leske und Budrich, pp. 382–569.

Havas A. (1999) A long way to go: The Hungarian science and technology policy in transition. *Institutional Change and Industrial Development in Central and Eastern Europe* (eds. A. Lorentzen, B. Widmaier, M. Laki), Aldershot: Ashgate, pp. 221–248.

Havas A. (2002) Does innovation policy matter in a transition country? The case of Hungary. *Journal of International Relations and Development,* vol. 5, no 4, pp. 357–379.

ICCR (1997) *Conference Summary on the 2nd Semmering Science and Technology Forum: East-West Cooperation in Science & Technology at the Eve of the European Union's Eastern Enlargement. Semmering (Austria), November 13–14, 1997*, Vienna: ICCR.

Inzelt A. (1999) *Transformation role of the FDI in R&D: Analysis based on databank*. Paper presented at the 2nd International Conference on Technology Policy and Innovation, Lisbon, August 3–5, 1998.

Josephson P.R. (1994) The political economy of Soviet science from Lenin to Gorbachev. *Scientists and the State. Domestic structures and the international context* (ed. E. Solingen), Michigan: The University of Michigan Press. P. 145–169.

Le Masne D. (2001) *Report on the 2nd Parallel Session (RTD Systems) of the 8–9 March Seminar on Integration of the Candidate Countries into ERA (March 2001)*, Brussels: European Commission.

Loudin J., Schuch K. (2009) (eds.) *Innovation Cultures – Challenge and Learning Strategy,* Prague: Filosofia.

Mickiewicz T., Radosevic S. (2001) *Innovation capabilities of the six EU candidate countries: Comparative data based analysis* (Study commissioned by the Directorate General for Enterprise – European Commission), London: University College London.

MIRRIS (2014) *Scoping Paper. Participation of EU13 countries in FP7* (prepared and compiled by C. Seublens), Eurada.

Nauwelaers C., Reid A. (2002) Learning innovation policy in a market-based context: Process, issues and challenges for EU candidate-countries. *Journal of International Relations and Development*, vol. 5, no 4, pp. 357–380.

Nedeva M. (1999) When David met Goliath: Research collaboration in the context of changing political realities. *Innovation*, vol. 12, no 3, pp. 305–322.

OECD (1994) *Science and Technology Policy. Review and Outlook 1994*, Paris: OECD.

OECD (2002) *Frascati Manual: Proposed Standard Practice for Surveys on Research and Experimental Development* (6th ed.), Paris: OECD.

PROVISO (2014) *7. EU-Rahmenprogramm für Forschung, technologische Entwicklung und Demonstration (2007-2013), PROVISO Bericht, Juni 2014* (prepared and compiled by M. Ehardt-Schmiederer, J. Brücker, D. Milovanovic, V. Postl, C. Kobel, F. Hackl, L. Schleicher, A. Antúnez), Wien.

Radosevic S. (2011) Science-industry links in Central and Eastern Europe and the Commonwealth of Independent States: Conventional policy wisdom facing reality. *Science and Public Policy*, vol. 38, no 5, pp. 365–378.

Radosevic S. (2014) Technology Upgrading and RTD Challenges in Western Balkan Region: Issues and Policy Options. Synopsis of Keynote Presentation. *R&D and Innovation in Western Balkans. Moving Towards 2020* (eds. I. Marinkovic, E. Dall), Vienna: Centre for Social Innovation.

Reid A., Radosevic S., Nauwelaers C. (2001) *Innovation policy issues in six candidate countries: The challenges*, Luxembourg: Office for Official Publications of the European Communities.

Reith R., Pichler R., Dirninger C. (2006) (eds.) *Innovationskultur in historischer und ökonomischer Perspektive. Modelle, Indikatoren und regionale Entwicklungslinien,* Innsbruck: StudienVerlag.

Schuch K. (2005) *The Integration of Central Europe into the European System of Research*, Wien: Guthmann-Peterson.

Schuch K., Dall E., Scheck H. (2013) *MIRRIS Policy Dialogue Methodology* (Deliverable 2.2, November 2013), Wien.

Suurna M., Kattel R. (2010) Europeanization of innovation policy in Central and Eastern Europe. *Science and Public Policy*, vol. 37, № 9, pp. 646–664.

Svarc J. (2006) Socio-political factors and the failure of innovation policy in Croatia as a country in transition. *Research Policy*, vol. 35, no 1, pp. 144–159.

UNESCO (1999) *Report from a meeting of ministers and senior officials responsible for science policies in Central and Eastern European Countries*, Venice: UNESCO Regional Office for Science and Technology for Europe.

UNESCO (2000) *European S&T policy and the EU enlargement. Report from a workshop of experts from preaccession CEEC and EUROPOLIS project group*, Venice: UNESCO Regional Office for Science and Technology for Europe.

van der Lande R. (1998) Innovation in Eastern European Countries. *Cohesion, competitiveness and RTDI: Their impact on regions* (ed. J. Cobbenhagen), Maastricht: Publishing House of the Town Hall, pp. 66–75.