The mid-term review of Horizon 2020 and the design of FP9
Position Paper of Italian universities (CRUI)

Take-away message

- Real breakthroughs with impact on our future life can only be reached by financing top fundamental research without looking prevalently at TRL
- Increasing funding to Universities and enlarging their participation into research topics definition will enable research with wider societal benefits and stronger interdisciplinary character
- Project calls with success rates around or below 5% represent a quite inefficient process because of the time spent by researchers for the preparation of unfunded proposals. Moreover, they give rise to important issues on project review processes and on soundness of the evaluation procedures
- Let a scientist/researcher focus on his expertise and mission, i.e. performing high quality research. Nowadays, proposals have too many sections and forms that have little to do with the scientific core of the project but often result decisive to be funded

Preliminary

Horizon 2020 (H2020), the Framework Programme for research and innovation of the European Union, is the main instrument for funding research activities, technological development, and innovation in Europe. In terms of budget, so far the Italian participation resulted in a financing of 1.413.616.904,00 € (GA until 30/09/2016), corresponding to the 38,99% of what obtained during the entire FP7 programme (3.625.295.741€). By Sept. 2016, Italy assumes provisionally the fifth position in the ranking of countries, with a return of 8,2% in the EU-28, behind Germany, Britain, France, and Spain. This is slightly above the result achieved in the whole Seventh Framework Programme (8,0% EU–28).
The Italian universities have significantly increased their participation in H2020 compared to FP7, but their success rate is lower. One of the main reasons is the very applied and industry-oriented activities of many of H2020 programmes. So far, the Italian universities have achieved 31.09% of the total return to their country, for a total amount of more than 439 million € (in the whole FP7 this has been 1.236.643.685€, corresponding to 34,11% of the total).

This document describes the joint position of the Italian Universities organized in the Conferenza dei Rettori delle Università Italiane (CRUI) with respect to Horizon2020 and contains some evaluations and suggestions for the next Framework Programme (FP9).

The role of Universities in FP9

Universities are the pulsing heart of knowledge as well as the key building blocks of the future of a Country. Generation, development, and transfer of knowledge have a time scale that is typically not varying as fast as that of commercial market, but are basic prerequisites. It is essential that the European Union will focus not only on the economic, but also on the social and cultural well-being of its citizens, and the dissemination of knowledge. These must be key objectives of the next Framework Programme (FP9). In this respect, it is highly desirable that the EU will significantly increase its investments in research and innovation to realize a better Europe in 20 years from now. A wider and expanded knowledge is not only required to sustain economic growth but also enables a better future with EU as a central actor. It is essential to address questions and challenges related to social and cultural issues since research and high education programmes break religious and political walls. In this process, the role of European Universities is central and cannot be underestimated. Universities have a fundamental role in creating a new model of European space, connecting Europe's generations of students, scholars, researchers and citizens. Universities not only generate knowledge, but transfer it to young generations, provide train in the skills necessary for future industries and achieve the next technological revolutions, support and encourage entrepreneurialism, facilitate understanding societal needs and societal changes, favor critical thinking, engage against inequalities, as well as help educating to openly debate about their problems and desires. In short, Universities are a key element in developing and establishing democracy. It would be a great mistake to undermine the role of European Universities in the next European Framework Programme.

More investment in fundamental research

With respect to FP7 and previous programmes, H2020 is creating a gap between the fundamental research, which is supposedly funded by local institutions at national level and by the 1st Pillar of Horizon2020 at the European level (European Research Council (ERC), and MSCA) and applied research. Horizon2020 strongly supports innovation, which is financed through social challenges and industrial leadership but there is a significant, largely unaddressed demand for basic research as demonstrated by the low success rates of the dedicated calls. In the next FP9 programme more funding should be allocated for collaborative projects at low-medium Technology Readiness Levels (TRL). It would be strategic to develop calls focused on high TRL as well as others more focused on connection between basic research and innovation, with lower TRLs. Europe's capacity to lead in frontier-led research is essential also for innovation. Real breakthroughs cannot be planned but are essential to human progress. Excellent science requires collaboration, communication, and competition. This should be integrated with more applied research objectives and with educational programmes (see below).

Presently, big projects with high TRL are developed mainly by big companies (often without participation or with marginal participation of Universities). This reduces the chances to have successful proposals in member states like Italy with an economy largely based on small-medium enterprises (SME). SME have a too small infrastructure to be really able to dedicate time and efforts to enter in the high risk/low gain competition for European funding. In many cases they could participate only in collaboration with Universities, which have dedicated infrastructures and personnel for shaping a project proposal. A programme that mainly favors big projects from big companies in FP9 will deepen European inequalities and marginalize the role of Universities and of Countries with companies which are too small to take the industrial leadership in the proposal.

More investment in interdisciplinary research

The peculiarity of contemporary research activity is in its focusing on problems rather than on disciplines. Despite that, H2020 work programmes sometimes refer to interdisciplinary research more as a keyword than as an actual systematics approach. Problem-focused FP9 calls should be included, supporting interdisciplinary and trans-disciplinary research at two different levels: by encouraging the setting up of project consortia composed of labs with different backgrounds and by pointing out topics and problems that can be addressed only by a genuinely multi-disciplinary approach.

Structure of the proposals and success rate

In general, the level of competition is simply too high and the rate of success too low. Even if selection is done following the most rigorous and robust procedures, low levels of success inevitably lead to concerns on the accuracy of the selection and the motivation for rejection. As a consequence, researchers are wondering if it is worth investing a lot of energies in an effort that has little chances of success. With success rates in some calls below 5%, this is a quite an inefficient process: the benefit to fund new projects is lost if compared with the time and cost in proposal writing, which keep researchers far from their primary activities and laboratories. This is particularly evident if we compare European situation with that of US and China, making the competition unfair. Moreover, it becomes very difficult to explain to the proponents why their project has not been funded. This is raising frustration, and is discouraging many researchers from applying. This can be overcome with more investment in research and with a different scheme of proposals submission. For instance, it can be beneficial to generalize the two-steps evaluation process in order to reduce the burden, provided that a sound and robust selection is done already in the first round.

Furthermore, there is too much emphasis in the proposals on aspects that have little to do with the excellent science and its impact on the society. Scientists are not only asked to perform excellent science: they must also engage with financial issues, social impact, technology transfer, education and internationalization, ethical issues, legal aspects, communication and dissemination, etc. While these aspects are clearly important, the impression is that their weight is becoming larger than that of the scientific and innovative content of the proposal. It cannot be expected that scientists and researchers are experts in all the fields mentioned above. Scholars have the feeling that it is not science that finally counts in the evaluation, but rather the inclusion of specific paragraphs, the definition of given general objectives, etc. Often, large parts of the proposal are written by dedicated companies, specialized in optimizing the non-scientific parts of proposals. These aspects of a project should be evaluated with a "Yes" or "No" procedure, while too often proposals are dismissed based on criticisms on aspects that are not central to the project idea. Instead of implementing these activities within every specific research proposal, one could envisage the creation of specialized teams active at national or local level in charge of all or part of these activities.

Meet societal challenges: integrate research and education

Horizon2020 has introduced the concept to strengthen the social impact of research and innovation. This is a positive and innovative aspect of European projects that should be further encouraged. However, the integration of social activities into research and technology projects

turns out to be more difficult than expected. This is evident in particular from economies based on SMEs which do not have the appropriate infrastructure and personnel to create and establish links with Universities. An increase of funding specifically devoted to analyze the social benefits of S&T projects could help reaching the objectives.

Along the same lines, a key role is that of educational activities. A better society cannot only growth economically and technologically. The future of the whole society, as well as of innovation and entrepreneurship, depends on students, and their education. The next FP9 must foster a closer connection between research and education programmes. For instance some form of integration of FP9 and Erasmus+ should be encouraged. Specific education platforms should be included within joint collaborative projects dedicated to research and innovation. This can be based on exchange of Master and Ph.D. students and creation of new courses and e-learning platforms. This would also strengthen the links between Universities, with strong expertise in high level education, and the system of companies, SMEs, and other research institutions. Reinforcing the ITN-MSCA programme would be a simple way to reach most of these objectives.

Involvement in Topic definitions

Universities have positioned themselves at the frontier of fundamental and applied research. Through international collaborations and participation to conferences, researchers are exposed to hottest topics and aligned with latest developments in fundamental and applied research. Universities also have the capability of providing multidisciplinary efforts as natural aggregators of competences. These facts suggest that Universities should be more actively involved in the definition of research topics for FP9 calls for suggesting new topics, establishing priorities, and paving the way to fundamental and interdisciplinary research. The present procedure of collecting contributions and comments to draft work programmes apparently seems limited to a manifestation of interest with minimal impact.

Engagement towards critical geographic areas

In this particular moment, it is important for Europe to be open towards collaboration with emerging economies and Countries, in particular in the basin of the Mediterranean Sea. Specific collaborative research actions should be supported to foster joint research programmes with North Africa and Middle-Est, favoring mobility of researchers from these countries to European research institutions. A simplified access to funding for collaborative research would enhance the role of Europe as a leading entity to promote social and cultural advances in these Regions. An European leadership in this context could also be beneficial for European institutions in terms of attraction of the best and more motivated researchers from these countries.

Simplification

We acknowledge and appreciate the simplification achieved with Horizon 2020, with respect to the previous programmes. One example is the participant portal, a useful tool that allows coordinators and partners to act easily and quickly during all phases of the project. We suggest to pursue simplification and boost this process as much as possible. In particular, there is a need to unburden the administrative work in terms of reporting but also in terms of procedure.[1]

[1] For example it should be crucial to make available to coordinators the up to date bank account coordinates of all partners. This information is on Participant Portal and is essential for the coordinator that has to transfer money to

Horizon 2020 proposers are those that can provide the most convincing projects and at the same time can afford the burden of the procedure and burocracy that goes along with the proposal's activity itself. There is a sort of 'unwritten rule' that says that only those who can afford the administrative burden will participate. Even if Universities are well prepared for this job and have people trained to accomplish all the formalities and procedures foreseen by the programme, the amount of work required is nevertheless awesome. This of course implies a lot of time-consuming work that ends up with the fact that part of the amount granted to projects is actually spent on people dedicated to administrative activities.

Synergies among different programmes should be encouraged to simplify the identification of the best call to apply. For example Erasmus+ and Horizon (first pillar). To have all coordinators, partners and administrative staff work together on FP9 programmes and properly understand the procedures, and become familiar with terms and with last published updates, it is essential to schedule frequent on line trainings and webinars. A good example to be followed are 'coordinator's day' that are well organized and can be attended remotely.

An additional action to be considered is to modify the CORDIS project database to make it more accessible and facilitate external analysis allowing to download in a suitable format (Excel, ASCII, etc.) the main information concerning the funded projects (Subject, Programme, Beneficiaries and Countries). A unified website providing information for all EU open calls (FP9, Erasmus+, Interreg, etc) would also be very appreciated, especially if allowing to download the major information (deadlines, available budget, subject, topics keywords, website link, etc) in ASCII format for an automatic preparation of internal call bulletins within the Universities.

Research Infrastructures

With reference to the Research Infrastructures we agree with the proposal of the association Science Europe that recommends that calls 'should cater for the different stages of the Research Infrastructure lifecycle'. Established European Research Infrastructure Consortia (ERIC) must be supported (including their transition into legal entities) in order to permit access to their facilities and benefit from their strong expertise. However, actions for implementing novel ERIC should be also planned since science is dynamic and can not be constrained in strict frames for long periods, but is expected to require new infrastructures to respond to novel, interdisciplinary challenges and support emerging communities.

Structural Funds and FP9

Depending on the scenario[2] that will be realized in Europe in the coming years, balancing cohesion without losing excellence might be an important trade off to be addressed (even more important than it is now).

Excellence must remain the core value and criterion but at the same time, it is important not to forget that balancing and cohesion are necessary policies to be followed in order to help the less developed European Countries to catch up. This is not in a philanthropy context, but in the logic that 'Europe continues to derive its strengths from the cultural diversity of its regions'.[3] The

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partners as quickly as possible once received from the commission. At the moment the procedure is carried on outside PP and renewed every time there is the need to transfer amounts, due to the fact that bank coordinates may vary.

[2]https://ec.europa.eu/commission/white-paper-future-europe-reflections-and-scenarios-eu27_en _ 'White paper on the future of Europe' 01 March 2017

[3] http://www.the-guild.eu/news/2017/guild-fp9-vision.pdf The Guild 'Serving Europe's Societies: Research, Innovation, and the Future of Europe' - March 2017

participation gap leads to brain drain, which is the opposite of the researchers' mobility that we should booster.

With this idea, a closer linkage between FP9 and Structural funds might be planned.[4] In particular, part of the Structural funds could be dedicated for funding projects, which were evaluated eligible in EU calls and received a seal of excellence (for the research activities planned in the eligible regions). This action would facilitate to close the gap with the most developed areas allowing the beneficiaries to enforce their EU network of collaborations and competitiveness and favoring success in future competitive EU calls. Moreover, this action would also drive excellence and a more effective use of the available budget within the Structural Funds. Currently, similar policies are already possible but were rarely realized while they should be actively promoted and encouraged.

European Innovation Council (EIC)

Activities should build-up on excellent science, with a focus on research-driven innovation. Bottom-up initiatives should be given a particular relevance, especially when there is a potential for disruptive innovation even on a medium to long-term basis. Activities should be funded starting from a small level of TRL. It is important than the EIC will recognize universities as central actors in innovation, beside research centers and companies. This means that adequate representation must be given to Universities in the governing body of EIC. Very important in constructing this new institution is also a survey of the activities performed so far by the European Institute of Technology, in particular via the instrument of the Knowledge and Innovation Communities (KIC). It remains to be understood and qualified also the level of integration or overlap of EIC and EIT.

[4] http://ec.europa.eu/regional_policy/sources/docgener/work/2015_03_impact_crisis.pdf