



From the old ERA to a new era of “Open Knowledge Creation in Europe”

Policy Brief by the Research, Innovation, and Science
Policy Experts (RISE)

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This brief explains the dynamics behind the transition from the old policy narrative of European Research Area (ERA) to the new approach to be followed in Research and Innovation policy, namely "Open Knowledge Creation in Europe". The brief describes the origins of ERA policy, highlighting the importance of supply-side instruments and focus on collaborations followed on initial stages of policy development. It goes on to explain the new concept, elaborating on the notion of "openness", its international dimension and focus on science and innovation, and discussing it taking into account the development of digital single market, service innovation and disruptive technologies.

FROM THE OLD ERA TO A NEW ERA OF "OPEN KNOWLEDGE CREATION IN EUROPE"

This brief introduces the three RISE papers produced for the discussion with Commissioner Moedas (18th June 2015) under the overall policy narrative of the shift from ERA towards a new era in Europe of "Open Knowledge Creation".

The old ERA viewed in retrospect

ERA was in many ways a direct response to the need to restructure the internal European research market following the ambitions as expressed in the Lisbon strategy.

It focused on the physical space of Europe – "l'espace européen" – on the supply side of research – with the Barcelona 3% R&D intensity as public and private investment target – and on internal complementarities and mobility – with the portability of (ERC) grants and jointly with Member States (MS) research and technology programs/initiatives as new features. As a result, the creation of, and progress towards an ERA was, and at that time correctly so, by and large dominated by supply-side concerns, but also diffused – in the sense that one was supporting at European level a little bit of everything: ultimately a small fraction of what most, and in particular the large, MS were spending nationally – and obsessed with increasing collaborations across Europe.

As highlighted in the first RISE paper (Weber *et al.* 2015¹), after 2007 non-funding policy elements were added with the 5 dimensions of ERA, which included also reflexions on the funding instruments (e.g. implementing agencies, competitive funding, etc.) and on knowledge transfer. With the concept of an Innovation Union introduced in 2011, the role of the so-called framework conditions (mostly IPR, standards, VC rules) were now also becoming more explicitly recognized but without a clear view as to what one would be able to achieve with these policies mostly not in the remit of DG RTD. With the advent of H2020, a three pillar strategy was defined aiming at excellence, industrial leadership and most novel: societal challenges. In terms of instruments, the standard 'collaborative' instruments were enriched with new ones: ERC grants, JTIs, JPIs, ERA-NETs, PCPs, etc.

In a nutshell, over the last decade, DG RTD defined 'implicitly' its R&I policy by structuring its funding and developing new funding instruments². Recent discussions in the Council regarding the ERA Roadmap show that MS are willing to commit to the implementation of the ERA. However, there are uncertainties, e.g. about targets and the time-table. On the other hand there is also an opportunity to use the willingness of MS to move forward towards a new 'ERA'.

However, as highlighted in the three RISE papers there is now an opportunity to define more 'explicitly' a new R&I policy framework for the EU while taking more fully into account the existence of MS policies and their funding. Again there seem to be two options: a continuation of what DG RTD currently 'implicitly' supports: broad objectives in terms of excellence, industrial leadership and societal challenges under 'an efficiency constraint' but without the ambition of monitoring how these efforts add to national efforts in the pursuit of EU-wide objectives; or something more ambitious, where RTD efforts are seen as the 'means' to a much broader end and where synergies and complementarities with MS efforts are monitored and assessed.

A new era of "Open Knowledge Creation in Europe"

Three concepts are central in the proposed "new era" as described in the three RISE papers.

1. First and foremost "**openness**". Openness to the rest of the world as the Tsipouri *et al.* RISE paper³ highlights, but also openness in science with the emergence of "open science" and openness in innovation with the more common notions of "open" and "disruptive" innovation.
 - a) The world today is indeed very different from what it was in 2000, or in 2007 just before the financial crisis. In 2000, the year of the Lisbon strategy, the EU invested in total a similar amount on research as the US; today the EU spends 40% less. 80% of world R&D is spent today outside Europe. While many European policy makers were already hoping for a new "digital era" boosting growth and employment in Europe in the first decade of this

¹ Weber, M, Andree, D, Llerana, P. "A new role for EU Research and Innovation in the benefit of citizens: Towards an open and transformative R&I policy", RISE Working paper, June 2015.

² A very similar process took place in many MS development of national research and innovation policies.

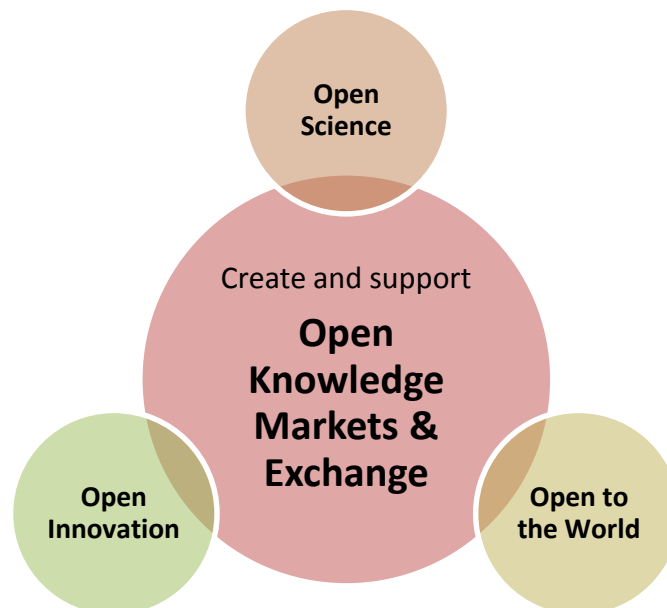
³ Tsipouri, L. "ERA Open to the World. EU R&I strategy responding to globalization", RISE Working Paper, June 2015.

Millennium, it is only now with the signing of the Digital Single Market that businesses and citizens are likely to witness the benefits. The European digital single market was, and is, a pre-condition for a “vibrant open knowledge-based society” at the basis of creativity not just in research and science but also in innovation.

- b) Opportunities to capture value from “service” innovation are almost endless. Outsourcing trends create a constant demand for services with the Internet opening up opportunities to capture value on a global scale. And while significant efforts have been made to support service innovation on a national level, little has been done to make full use of the potential on a European level. At the same time, digital technologies have more than ever brought to the forefront the disruptive nature of innovation challenging the incumbents to reinvent themselves. Value creation has become based on combinations where technologies are bundled together with intangible value creation leading to new business models. These recombination and fragmentation processes are global in nature, as highlighted in the Tsipouri *et al.* RISE paper.
- c) At the same time, digital technologies create similar disruptive impacts on the organisation of research both within and outside Europe. Effectively, the world has become a potential source of networking, sharing, accessing and producing information with the emergence of new ways of data mining: e.g. mining elements of tacit knowledge such as experience sharing, social bookmarking, etc. that were not undertaken until very recent times. Science and research, from scientific research infrastructure to the education and training of researchers; the mobility of researchers and of ideas, research outcomes and experiments; as well as innovation have been equally transformed by digital technologies, as reflected today in the notion of “open science”.

As illustrated in Figure 1 below, these changes have dramatically transformed the way research and innovation are carried out today at global level and in Europe.

Figure 1: Open Knowledge Markets and Exchange



2. The second concept “**knowledge**” is of course at the centre of what DG RTD is all about. However, as highlighted in Georgiou’s *et al.* RISE paper⁴, it is important to realize that the value to society of science, research, and more broadly knowledge, goes far beyond the purely “economic value” represented in economic models by research’s measurable contribution to Gross Domestic Product (GDP). Science involves the search for better, more comprehensive explanations, often driven by curiosity and the need to understand unexplained phenomena. Science often acts as a guidepost in that regard: it helps solve problems of society.

R&I generate in other words value in multiple ways and within different time frames. The “openness” of science and innovation has implications for the speed at which the development of

⁴ Georgiou. L. “Value of Research”, RISE Working Paper, June 2015.

new research inventions result in new products, applications and services. Furthermore some of these will come from unexpected sectors and/or disciplines challenging existing knowledge; some of these will come from new research centres less connected to existing research excellence places, even individual citizens such as in the case of citizen science and citizen innovation. In many areas knowledge development is today an interactive process depending on input from various users and the wide availability of common international platforms. At the same time, while the development of new marketable products and services will be essential for Europe's long term competitiveness, it will be more difficult to separate out such contributions from contributions to solve much broader societal problems, bring about new life styles, change the behaviour of citizens with the emergence of more active and demanding citizens, etc. It is the contribution to this invisible change, the "invisible Europe" in the sense of not being statistically captured in our economic measures, which is also crucial in designing and implementing EU policies with respect to R&I.

As emphasized in the Weber *et al.* RISE paper, many societal, so-called "Grand Challenges" raise a multitude of very different challenges at the policy level. Some are connected to existing national and/or international regulation; some involve the need for long-term, more radical change transformations, so-called "transitions"; some will depend on new scientific and technological breakthroughs, while others depend on connecting existing science, business and NGO's in some form of co-creation; some will have to involve strong citizen participation but remain at the same time the primacy of government.

It is important to note that addressing "Grand Challenges" is not only a matter of direct benefit to society but, when appropriately dealt with, can foster competitiveness and generate growth, even if often invisible in economic statistics. Europe, because of its regulatory diversity, can actually take advantage of that: addressing Grand Challenges early is an opportunity for experimenting with regulatory "free zones": for the business sector to experiment, gain knowledge and adopt standards in areas where other countries might follow. The examples of Germany's early move in solar energy and Denmark's in wind energy provide support for such experimentation. The EU Lead Market Initiatives, even though limited to pilots, demonstrate that this is an approach one can improve upon and can further pursue in the future combining social benefits and potential breakthroughs in new markets. Such initiatives could have the benefit of leveraging public procurement funds (in the form of public demand-side policies) to complement supply-side R&D funding.

3. The third concept "**Creation in Europe**" highlights in particular the need for a more dramatic shift in R&I policy in Europe, and in particular at the EC level, towards the demand side of knowledge. "**Creation**" should be viewed here, and again in line with the two previous notions of openness and knowledge, as a broad concept, including the novel development of ideas, inventions, organizations, business models, apps, as well as the re-use, absorption of knowledge in all its forms from different sectors, disciplines or regions in the world. It is undoubtedly the weakest part of European implementation since the Lisbon strategy.

As the Weber *et al.* RISE paper highlights "**creation in Europe**" is hampered by various regulatory barriers; by lack of scale advantages in public procurement, and particularly in lead markets; by the dominance of relatively small countries in Europe each with their own, small public budgets in research and innovation support programs.

Digital technologies have dramatically altered though the creative opportunities for disruptive innovation; for new forms of internal and/or external organisation of creating value, visible as well as invisible; for locational advantages based on "smart specialisation" with digital technologies breaking down geographical barriers but also sectoral distinctions. The fragmentation of value chains has created similar scale impacts on both the organisation of research and the way in which innovation takes place. In all these cases the shift from the old simple Internet technologies to WEB 2 whereby information processes are being organized differently implies often, new disruptive innovation processes often with individual and/or collective end-user involvement.

The "**in Europe**" part of these changes has been generally speaking, insufficiently addressed even though it is absolutely essential from the perspective of European growth, value added creation and employment. "Openness, knowledge and creation" have with digital technologies become footloose. The challenge today is how to guarantee local anchorage and efficiency gains of such "**Open Knowledge Creation/markets**". Notions such as "circular economy", reindustrialisation or smart factory/industry 4.0, sustainable and social innovation appear of particular relevance. Issues which RISE so far has not yet addressed, but which we would be keen in doing so.

While the rationale for promoting a "circular economy" transition are linked to a number of global drivers, such as global pressure on resources; global technological change such as the internet of things and additive manufacturing; global implementation of sharing economy business models, this transition is likely to enable also the reindustrialisation of Europe based on models of mass-

customisation rather than mass production. Such transition requires a systemic approach to innovation, an eco-system of initiatives, a family of actions combining technological/technical innovation with innovation in business models, co-design or co-creation with stakeholders and end-users, financial innovation, regulatory reform, governance, skills as well as social innovation. All these forms of innovation will need to be integrated and addressed together.

Regulatory innovation will be even more crucial here because it will influence not just the uptake and diffusion of new technological and organisational innovations, but also determine to a large extent the success in financing innovation. What often holds back investment is not the lack of money, but the regulatory uncertainty and/or unpredictability. Different finance models are responding to different business models that are emerging in the circular economy: B2B, as in the case of leasing instead of buying copier machines – there is endless innovation potential and economic gains in such models. Firms known for selling lighting equipment, selling today lighting services, something which entails a strong incentive for innovation and resource efficiency – or B2C as in the case of consumers no longer buying a washing machine but having access to tailored washing services at home, through equipment owned by the service provider who can monitor performance in real-time; or C2C in the typical sharing economy framework thanks to peer-to-peer platforms such as AirBnB or C2B as in the case of consumers generating energy which they sell back to business – 3D printing is likely to amplify this latter trend. And the financing of such business models will also vary: when an innovation is technology-based, equity is likely to be the most appropriate model due to the high risk involved; when an innovation is community-based, crowd-funding may be most adapted; for large stand-alone projects, asset financing may be more suitable; for cross-sectoral supply chain innovation (e.g. industrial symbiosis where the waste of one becomes the feedstock of another), green bonds may be suited; and overall, the provision of financial guarantees (public and/or private) is likely to become much more important.

Policy discussion on the position of DG RTD

Most of the discussion with Commissioner Moedas focused on the three brainstorming RISE papers which could be interpreted as building blocks for the proposed new “**Open Knowledge Creation in Europe**” R&I policy framework outlined here.

As highlighted in the Weber *et al.* RISE paper, while the EU has today a large set of tools and instruments for the supply of R&I (i.e. Horizon 2020 and Structural Funds, see table 1 in their paper), there doesn't seem a coherent policy framework putting those instruments into a context. As a result there appears today a lack of a long-term stable approach, a weak connection to other policies, and no clear benchmarks for assessing progress/results.

In retrospect, RISE experts consider that the instrument-led focus of EU R&I policy might well have hampered the impact of such investments because: first, such programmes appeared sometimes disconnected from a broader policy purpose; second, implementation triggered conservatism; and thirdly, this was actually rarely detected as the assessment of performance ignored often the quality of outputs and real success. For RISE, R&I policy will have in the future to link closer to the other EU policies, defining concrete missions in the realm of a broader EU energy policy, transport policy, environment policy, etc.

Ultimately DG RTD finds itself thorn between two policy extremes: on the one hand to further implement and perfect a 'pure supply-side R&I policy', exclusively bottom-up, following the ERC model, where scientists compete for funding on the basis of excellence and where one 'hopes for the best' with respect to the valorisation of the knowledge thus generated (i.e. one hopes that market actors will find what they need from the pool of knowledge). Or on the other hand a 'pure demand-side R&I policy': generic, pursuing the single (digital) market and stimulating firms with non-oriented tax incentives. Both of these extreme strands have a function, but what appears lacking is coordination and synergies between such extreme supply and demand positions. For this, in view of RISE the supply-side will need to be more mission-oriented, in the sense of engaging in resolute action addressing major societal challenges; while the demand-side will have to smarter, allowing disruptive innovations reaching out to the single market. Bottlenecks and the existing regulatory framework, as highlighted in the Weber *et al.* RISE paper, block disruptive innovation and prevent new business models to develop, for instance those responding to the sharing economy. A more focused demand-side policy would therefore have to address regulatory barriers and incentives for disruptive innovation, as a first priority.

However, DG RTD is limited by its existing instruments and seems over time to have been pushed back into a supply corner. The other DGs perceive it in many ways as a pure supply-side funder: “you have the instruments”. One should try to get out of this internal “cornering”. From this perspective DG RTD should provide support to R&I in the framework of an integrated strategy

linking supply and demand. That implies strategic interaction with the other DGs. This is actually also the real notion of mission⁵. DG RTD should hence work with other DGs towards long-term targets, e.g. public transport and disruptive innovation, and develop the corresponding integrated strategies.

Maastricht,

June 18th, 2015.

⁵ An example of a more mission-oriented supply in the PPPs is the one for future internet, financed by DG CNCT. The approach is based on clause 41, obliging projects to work with each other for a broader goal. At the same time, there is a sequencing of projects into three phases, where the latter is very close to market, funding accelerators throughout Europe where innovative SMEs can get finance.

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Studies and reports