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Towards a New (European Research) Deal The Case for Enhanced Fiscal Policy Coordination on Research and Innovation*

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**The views expressed in this article are those of the author and do not necessarily reflect the official European Commission's view on the subject*

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Abstract

The paper reviews the evolution of research and innovation in the EU and assesses how current policies and programmes have influenced the development of Europe's research landscape. Based on existing literature, evaluation reports and practice, the paper critically examines the effectiveness of current European research funding instruments in a context of open innovation and in the presence of global spillovers. It therefore develops a subsidiarity test to assess whether current rationales still prove sufficient to justify policy intervention in this area.

The paper sheds light on how to improve the effectiveness of EU action by enriching it by the use of coordinated fiscal policy for research funding. This will constitute an incentive to genuine bottom-up research, development and innovation (R&D&I) and a stimulus to local investments in innovation. The paper also assesses the potentials of a reinforced open method of coordination as well as a review of state aid law in the field of research funding in the EU.

Keywords: research and technology, innovation, research policy, fiscal policy

JEL Codes: H1, H2, H3, H4, H5, L5, O3

Table of Contents

1. INTRODUCTION	4
2. GOING BEYOND THE CONCEPT OF "COMPARATIVE ADVANTAGE" IN RESEARCH?	5
2.1. OPEN AND USER CENTRIC INNOVATION.....	5
2.2. GLOBALISATION, GLOBAL CORPORATIONS AND GLOBAL RESEARCH SPILLOVERS	6
2.3. THE DISAPPEARANCE OF "FIRST MOVER" ADVANTAGES	7
3. ARE THE EU RESEARCH INSTRUMENTS FIT FOR THE PURPOSE?.....	8
3.1. <i>A SUBSIDIARITY TEST FOR RESEARCH POLICY IN EUROPE</i>	8
3.2. <i>CURRENT INSTRUMENTS FOR IMPLEMENTING RESEARCH POLICY IN EUROPE</i>	10
3.3. <i>EFFECTIVENESS OF EU RESEARCH AND INNOVATION NETWORKS</i>	11
3.3.1. <i>LINKING RESEARCH RESULTS AND COMPETITIVENESS</i>	12
3.3.2. <i>EFFECTIVENESS OF CURRENT INSTRUMENTS.</i>	14
4. TOWARDS A "NEW (EUROPEAN RESEARCH) DEAL" FOR THE 21ST CENTURY?	15
4.1. <i>A NEW MODEL TO BOOST RESEARCH AND INNOVATION IN EUROPE</i>	17
4.2. <i>HOW TO TUNE RESEARCH INSTRUMENTS FOR THE CHALLENGE?</i>	17
4.3. <i>TOWARDS FISCAL COORDINATION FOR RESEARCH: POSITIVE AND NEGATIVE INTEGRATION</i>	19
THE KEY CONCERN IS THE COMPATIBILITY OF TAX INCENTIVES WITH THE INTERNAL MARKET AND STATE AIDS RULES. SO FAR THE EUROPEAN COMMISSION HAS LIMITED ITSELF TO SET SOME GUIDING PRINCIPLES.	20
4.3.1. <i>STRENGTHENING THE OPEN METHOD OF COORDINATION (OMC) FOR FISCAL POLICY IN RESEARCH</i>	21
4.3.2. <i>THE POTENTIAL OF STATE AID LAW TO STRUCTURE THE EUROPEAN AREA OF RESEARCH</i>	24
4.4. <i>ADVANTAGES FOR NATIONAL GOVERNMENTS</i>	27
4.5. <i>ADVANTAGES FOR THE EUROPEAN COMMISSION</i>	28
4.6. <i>ADVANTAGES FOR THE RESEARCH COMMUNITY</i>	28
4.7. <i>INTERNATIONAL COOPERATION, GLOBAL CHALLENGES AND IPR</i>	29
5. CONCLUSIONS.....	30
6. BIBLIOGRAPHY.....	31

1. Introduction

After more than two decades of collaborative research at the EU level, European Research has moved qualitatively and quantitatively closer to the concept of an integrated area. The Framework Programmes for Research (FPs) have significantly contributed to this process and have brought together European partnerships in all fields of scientific investigation.

Despite this remarkable success, Europe's research still presents challenges in terms of fragmentation of efforts, insufficient coordination of research actors and disconnect with exploitation opportunities. This makes Europe overall less attractive than it might be for R&D investors and researchers.

The impact assessment of the 7th Framework Programme pointed out that the "way European research and innovation system is organised needs to be changed so that Europe becomes more attractive and efficient. Three aspects appear particularly relevant: The European R&D system must further open up; its framework conditions must become more coherent and conducive to private investment; and, finally, Europe must better co-ordinate its national research efforts"¹. The Report of the Independent Expert Group on R&D and innovation (chaired by Mr. Esko Aho) stated that "for companies, the principal barrier to investment in Europe is the lack of an innovation friendly market. In particular, the fragmentation of markets across the national boundaries of Member States provides a major disincentive for innovation"².

After assessing how research scenarios and cooperations have changed during the last decade, *the paper proposes a bottom-up approach to create the necessary market incentives for near-market research and innovation*. It holds that special

¹ European Commission, Staff Working Paper, SEC(2005) 430/3, Impact Assessment and ex-ante evaluation of the Proposal for the Council and European Parliament decisions on the 7th Framework Programme (EC and Euratom)

² European Commission, Aho Group Report, "Creating an Innovative Europe", 2006, http://ec.europa.eu/invest-in-research/action/2006_ahogroup_en.htm

attention should be given to *the use of fiscal policy to stimulate the creation of research and innovation clusters* and assesses opportunities for "*enhanced*" *Open Method of Coordination* or new *legal framework* in the area of research. It argues that the proposed options for improvement will encourage *new comers to approach the research field in Europe and market players to innovate for growth and jobs in target constituencies*. The paper also argues that governance of funding for innovation through tax breaks will require more coordination at EU level.

The proposed approaches of indirect funding to research and innovation, based on coordination of fiscal incentives, are complementary to the traditional EU mechanisms of direct funding. The paper attempts to analyse what could possibly be a fruitful contribution for leveraging research in ways that are effective, and conducive to the desired social and economic outcomes in the EU funding constituencies. It also sheds light on opportunities for the EU to focus on global market failures in the area of research and innovation (such as in fundamental and basic research or in innovative solutions requiring pan-European/global approaches), while encouraging Member States to focus resources in establishing the conditions for creativity and innovation in "near-market deployment".

2. Going beyond the concept of "comparative advantage" in research?

In recent years, research and innovation have been changing in three respects: the changed interaction between suppliers and users leading to the concept of open innovation; the increasing globalisation of research processes, the way research results are appropriated,.

2.1. Open and user centric innovation

In almost all areas of research, "closed" innovation cycles based on keeping discoveries highly secretive within the company, have been replaced by "open innovation". This move is the result of the adaptation of innovation cycles from

research, design, prototyping and testing to a more widely distributed knowledge, where companies cannot afford to rely entirely on their own research, but instead buy or license processes or inventions (i.e. patents) from other companies. In addition, internal inventions not used in a firm's business should be taken outside the company (e.g., through licensing, joint ventures, spin-offs).

Networks of open innovation accelerate research spillovers across global value chains and reduce time-to-market for research results. They also lessen the traditional comparative advantage of “first mover” research, since the diffusion of know-how will be faster. By the same token, if private returns to open innovation are not properly rewarded through a solid and possibly uniform system of intellectual property rights, private incentives to invest in research will be reduced by the propensity of research to spill over to other companies and individuals.³

User innovation or co-creation adds up to the concept of open innovation and refers to innovations developed by consumers and end users, rather than manufacturers. Products and services are actually developed by users, who then give ideas to manufacturers or increasingly co-design their products and services. These processes are encouraged by the use of information and communication technologies (ICT) allowing “collective intelligence” to emerge through interactive web tools (e.g. web 2.0 applications).

2.2. Globalisation, global corporations and global research spillovers

Growth, competitiveness and employment are critically dependent on product and process innovation, which itself depends crucially on investment in research. The importance of investing in research is reflected in economic theory (through the neo-classical, endogenous and evolutionary models of economic growth). But there is also empirical support for its positive impacts. Estimates of private

³ Tobias Fredberg, Maria Elmquist & Susanne Ollila, Chalmers University of Technology, 2008, *Managing Open Innovation - Present Findings and Future Directions*, p. 20, Vinnova, Swedish Governmental Agency for Innovation Systems, <http://www.openinnovation.eu/download/vr-08-02.pdf>

returns to firms' own investment in R&D still produce varying figures, but there is an emerging consensus that gross returns between 20 and 30 percent are common and plausible. Microeconomic studies confirm the existence of significant spillovers of knowledge from the firms performing R&D to other firms and industries. Spillovers typically raise the estimated gross rate of return on business investment by a range of 30 to 40 percent⁴.

In open economies, spillovers are not exclusively European. They are increasingly global. This implies that investments in research pursued in Europe do not necessarily result into economic growth for the continent only but rather into innovative advantages for the global economy. Letting aside the case for international responsibility in research and innovation activities especially in areas characterised by “global public goods” (e.g. the ITER project⁵), this trend raises concerns of “*just return on the investments*” for countries investing in collaborative research efforts and especially in smaller size economies.

2.3. The disappearance of “first mover” advantages

In the fast-moving landscape of global economies, traditional concepts of technological advantage need a revision. Over the last decades, the principle of “*first mover*” advantage in R&D has been considered as one of the key goals for companies to ensure a lead-market position ahead of foreign competitors. This principle has often inspired industrial policies for competitiveness.

This type of advantage is certainly not disappearing in research-intense businesses. However, it has been tremendously reduced when technological replication is particularly fast, such as in ICT. Even when first-mover advantages survive, there is a high risk that they could shift elsewhere, due to better framework conditions for exploitation of research in third countries and enhanced mobility of researchers.

⁴ European Commission, Staff Working Paper, SEC(2005) 430/3, *ibidem*

⁵ ITER is a joint international research and development project that aims to demonstrate the scientific and technical feasibility of fusion power

3. Are the EU research instruments fit for the purpose?

One of the major reasons for funding research and innovation through the public purse is to cope with a number of market failures that apply in these areas as well as to raise the competitiveness conditions of the funding constituencies in terms of growth and jobs. From a public policy perspective, the phenomena described above lead us to ask the *question of what could be the most appropriate instruments to keep the results of research and innovation efforts as close as possible to the investing constituency, while fostering its economic competitiveness.*

To this purpose a subsidiarity test on why research and innovation are funded at EU level will be performed together with an assessment of currently used instruments and their effectiveness to attain policy objectives of enhanced competitiveness. A proposal to complement them with the use of coordinated fiscal policies for research will be finally introduced.

3.1. A subsidiarity test for research policy in Europe

A subsidiarity test⁶ in five steps can shed light on the role of EU research policy while highlighting its justification. It also provides for a methodology to assess how to make best use of implementation instruments (including fiscal policies)⁷.

In line with the legal bases of the Treaties, research falls in the area of concurrent competencies. Direct funding of research and innovation in Europe finds its legal basis in Art. 166 of the Treaty (step 1 of the subsidiarity test). The key rationale for policy action on research at the EU level is linked to the existence of *market failures* in addressing research (step 2) mainly related to high risks and costs associated with it and the long time lags necessary for market exploitation of its

⁶ Article 5 of the Treaty prescribes that: "In areas which do not fall within its exclusive competence, the Community shall take action, in accordance with the principle of subsidiarity, only if and in so far as the objectives of the proposed actions cannot be sufficiently achieved by the member states and can therefore, by reason of the scale or effects of the proposed action, be better achieved by the Community. Any action by the Community shall not go beyond what is necessary to achieve the objectives of the Treaty"

⁷ J.M. Sun, J. Pelmans, 1995, Regulatory Competition in the Internal Market, Journal of Common Market Studies

outcomes. Furthermore, due to their nature, not all research results can be entirely appropriated by funding entities, thus generating *spillovers* across research communities without clear territorial boundaries. In many research endeavours, the use of large scale facilities as well as the need for adequate size of markets for exploitation make a large part of associated investments *sunk* (not recoverable upon exit).

Voluntary but credible co-ordination among member states does not automatically yield expected outcomes (step 3). Despite efforts to reduce duplication of research, potential overlaps in performing similar research in different Member States make a strong case for EU action in this area.

When coordination failure occurs, and other conditions are satisfied, there is a case for the EU initiative (step 4). This can be for example the case of a necessary EU framework for intellectual property rights. Especially in basic or fundamental research, as well as in the area of open innovation, the difficult retention of intellectual property rights linked to the absence of a coherent approach for patenting inventions in the EU, discourage private entities to bear the necessary investments⁸. Strengthening an effective system of returns to public investments is therefore necessary and a more coherent policy for patenting inventions and protecting intellectual property rights more consistently is a *conditio sine qua non* for stimulating this type of research as well as creating the rewards to it. This necessarily calls for a stronger coordination (if not, legislation) at EU level.

The role and types of legal and financial instruments for the EU to implement, monitor and enforce the envisaged EU action is determined in accordance with the principle of proportionality (step 5). Notwithstanding the recognition of clear market failures justifying EU action in (especially basic) research at EU level, the more research activities gets closer to market exploitation, the more publicly-funded research risks becoming a controversial area from a point of view of

⁸ Not all companies however refuse to invest in basic research (e.g. pharmaceutical companies are one example)

effectiveness, flexibility and retention of outcomes, as arguments related to industrial and competitiveness policy apply in this area more profoundly⁹. This is the area where a fine-tuning between policy objectives and policy instruments becomes relevant and necessary with a twofold objective: a) improving the effectiveness of research spent in terms of outcomes and innovation possibilities; b) enhancing competitiveness, growth and jobs in funding constituencies.

3.2. Current instruments for implementing research policy in Europe

Direct funding of research and innovation in Europe has been implemented through several legal and budgetary instruments throughout the years. The main one is constituted by the framework programmes for research and technological development (FP-RTD). Framework programmes cover basic as well as application research in areas defined by the co-decision procedure under Art. 251 and detailed in Specific (Implementation) Programmes.

Besides framework programmes, art. 169 defines joint research frameworks where the EU complement national direct funding for research by fostering coordination of efforts through multi-annual joint programmes , or specific coordination initiatives (such as the ERANETS actions).

Within the scope of art. 171, European Technology Platforms (ETPs) provide a scheme for addressing major technological challenges and focus on areas of significant economic and societal relevance where there is high public interest and scope for a European level response. Joint Technology Initiatives (JTIs) involve a legal public-private partnership to implement a clearly defined research objective and can, therefore, serve to implement a specific part or the entirety of a European Technology Platform.

Within the revised Lisbon Strategy for growth and jobs, the EU has also attempted to strengthen the role of structural and cohesion funds to fund for innovation projects. Between 2000 and 2006, approximately €13 billion – around

⁹ See: Stephen Martin, 2004, *Industrial Organisation: A European Perspective*, Oxford

6% of the EU Structural Funds – would have been spent on research infrastructures and networks, innovative business start-ups and the modernisation of SMEs. This approach is reflected in the Commission's Strategic Guidelines for Cohesion Policy¹⁰. In this case, programming for direct funding is done at regional level and there is a limited scope to avoid possibilities of wasteful duplication of efforts. However, structural and cohesion funds offer great opportunities for spreading innovation at regional level.

3.3. Effectiveness of EU research and innovation networks

Networks of research and innovation have become of critical importance for innovation processes as they allow for access to resources, capabilities, and markets. Forms of trans-national research collaboration have a long history (think about the Renaissance!) and have been a centre-piece for critical developments long before European research frameworks were established. However, evidence from recent studies¹¹ has shown that framework programmes have been paramount in structuring these networks in Europe and increasing the speed with which knowledge circulates across research entities.

In standard network phenomenology, the average number of steps for connecting two random entities is six (*six degrees of separation*)¹². Recent studies on framework programmes and their "imposed" contractual requirements have brought these steps down to 2,1-2,5 steps. That is to say that any research entity is only 2,5 steps from any other entities in the European research scene. That this amounts to better knowledge transfer has also been shown by overlap of European networks with the worldwide patent networks and a good statistical significance has been found, although European entities tend to patent less.

¹⁰ Council of the European Union, Council Decision on Community strategic guidelines on cohesion, (2006/702/EC) in OJ L 291/11

¹¹ European Commission, 2006, Study by CESPRI, Networks of Innovation in Information Society: Development and Deployment in Europe

¹² A.-L. Barabási, 2002, Linked: The New Science of Networks, Perseus, Cambridge, MA

The same evidence also found that European research networks (as all self-organising networks) rely on the key function of so-called "gatekeepers". Those are research entities of long-established history that "organise" research in Europe. Gatekeepers guarantee the solidity of the network and its attraction for researchers. However, this structure also has disadvantages, especially when "newcomers" are discouraged by entering the research network due to bureaucratic burden or the rather "conservative structure" of research networks in Europe.

EU framework programmes have overall been rather successful so far. But will they also be in the future? Five years after the last single largest enlargement and twenty years from the launch of the programmes- research entities from "New Europe" and Small and Medium-sized Enterprises (SMEs) feel discouraged by doing research within the schemes of the framework programme. Besides, the *complexity of rules for participation add to current dysfunctions*. "The costs of joining (research) networks, particularly for smaller institutions, can be a barrier to participation. In particular, bureaucracy and difficulty in coordination constitute important obstacles to the use of (research) networks. This issue is already well-known to the European Commission. Further efforts to ameliorate this problem should be considered"¹³.

3.3.1. Linking research results and competitiveness

The final goal for an economy to be "competitive" is to enhance productivity growth leading to an increase in standards of living. Many factors determine productivity performance. Among these are the ability to innovate through increased investment in R&D and human capital development¹⁴.

When the goal of competitiveness is included in the rationale of public intervention in application research, an assessment of the chain linking

¹³ European Commission, Cespri Report, *ibidem*. Parentheses are by the author

¹⁴ European Commission, COM(2003) 704 final, Some Key Issues in Europe's Competitiveness – Towards an Integrated Approach

application research to competitive outcomes must be performed and a comparison between the desired *vs.* realised outcomes needs to be made. Interconnected research communities and markets are conditions for global *spillovers* and are powerful levers for global growth. This is not bad. On the contrary, it is proof that shared and sustainable growth through innovation on a global dimension is possible.

Investments for research at EU level combined with the "participation rules" of framework programmes are key incentives for structuring the European research area and create the conditions for more connectedness. The expected results from this scenario are a larger stock of research occurring in the EU and possibly entering the positive cycle of patenting and exploitation in the EU territory. According to standard growth models, by stimulating investments in research, increased knowledge stock and technology capital will stimulate growth in the funding constituency through patenting and exploitation channels.

However, what seems to occur is a possible *decoupling* between desired policy outcomes at EU level and perceived trends in global research. In global research and innovation networks, stimuli pursued in the EU do not exclusively result into increased competitiveness in the EU but in global spillovers. As the Aho Report puts it, "it is well known that several major European firms no longer site new R&D initiatives in Europe".¹⁵

Evidence also shows that foreign R&D has a higher impact on domestic Total Factor Productivity than domestic R&D¹⁶. This is due to the existence of global value chains that allow research and production to be distributed across the world¹⁷. Through markets for technology (licensing contracts, mobility of skilled

¹⁵ European Commission, Aho Group Report, *Ibidem*

¹⁶ http://ec.europa.eu/information_society/events/wks_eco_impact/documents/ICTR&DBrusselsApril2008.pdf

¹⁷ The 2007 OECD Scoreboard notes a sharp rise in the globalisation of innovation. International co-authorship of scientific publications tripled between 1995 and 2005. Cross-border co-operation on inventions nearly doubled as a share of total inventions worldwide between 1991-93 and 2001-03. Foreign ownership of domestic patents increased by 50% between the early 1990s and the early 2000s. European Union countries interact most often with each other and are less globalised than the United States, while Japan and Korea are less

labour, patenting) knowledge can be absorbed. Therefore, *the correspondence between directly-funded R&D and competitiveness is less and less direct and less and less bound to the funding constituency.*

From a public policy point of view two questions arise:

- on the one hand, how to link EU funding (which finally tax-payer money) to returns on investment in collaborative research in terms of growth and jobs in the EU funding constituencies?
- on the other hand, if a degree of international spillover is accepted (outside the EU), what are the most appropriate means to internalise them? Should reciprocity clauses be introduced? Should international collaboration be enhanced? And what would the most appropriate and flexible means be?

3.3.2. Effectiveness of current instruments.

The rationale for funding research and innovation still holds true¹⁸. The social, environmental and economic benefits stemming from research are undisputed and the merits of public intervention have been positively assessed in many evaluation exercises¹⁹. The typical rationale for funding research at levels beyond national constituencies is relying on economies of scale and internationalisation of research. The *highlighted developments however impose a reflection on whether the currently used instruments for funding research at EU level are still up to the challenge of future innovation needs and whether they respond to a logic of linking tax-payer investment for research to desired outcomes of competitiveness, growth and jobs.*

The research evaluation community has recognised the “structuring” effect of these instruments on European research and their contribution to the European Research Area. They have also highlighted the top-down nature of most of these

internationalised overall, the report finds. OECD, 2007, OECD Science, Technology and Industry Scoreboard, <http://www.oecd.org/dataoecd/61/50/39525781.pdf>

¹⁸ Impact Assessment of the 7th Research Framework Programme

¹⁹ Aho Report, 2006

instruments with the exception of measures under art. 169 and partially under art. 171, which encourage Member States' coordination.

Several evaluations however have also pointed out that key research is often performed outside framework programmes²⁰ due to a number of reasons such as:

- competition over market exploitation of research outcomes and uncertainty on IPR protection. This discourages commercial entities from sharing research investments in application areas;
- the "red tape" of framework programmes especially hindering SMEs from participating and implying high costs to larger research entities in the three phases of proposal submission, negotiation and project reporting;
- Literature also debates on the ability of FPs to connect a number of "peripheral research entities" to the wider research community in the EU and globally through "research gatekeepers", which is a positive phenomenon from a point of view of territorial cohesion and budget redistribution. However, this also often implies weakening the pursuit of research excellence.²¹

4. Towards a "New (European Research) Deal" for the 21st Century?

In the current economic context more than ever investments in research and innovation need being encouraged as they have the potential to open up opportunities for new markets and enhanced productivity. However, many European economies are still far from reaching the target of 3% of annual GDP invested for research²². Some critiques are voiced on the use of such a numerical

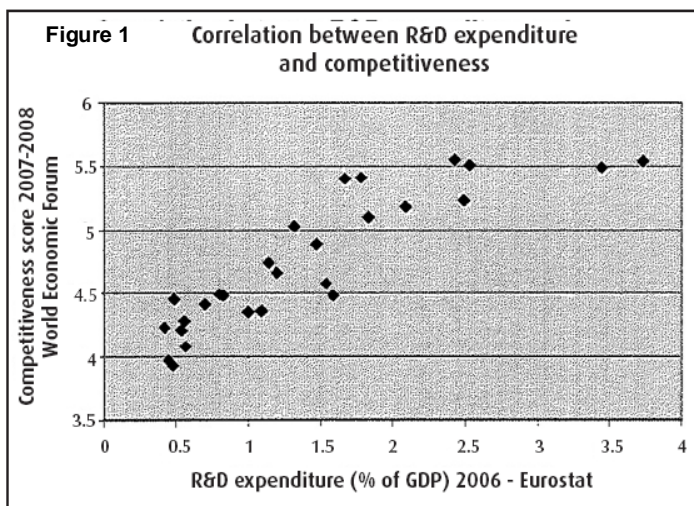
²⁰ European Commission, 2004, Five Year Assessment of IST-RTD (1999-2003), Panel Report chaired by Professor José Mariano Gago

²¹ European Commission, 15 September 2008, Hearing on cohesion policy and regional innovation; Report Hearing Paper 2,

http://ec.europa.eu/regional_policy/policy/future/pdf/2_hearing_on_cohesion_policy_and_regional_innovation_15-09-08.pdf see also European Commission, 2007, 4th Cohesion Report: Growing Regions, Growing Europe

²² The Barcelona European Council in 2002 reviewed progress towards the Lisbon goal agreed that investment in European research and development (R&D) must be increased with the aim of approaching 3 % of GDP by 2010, it also called for an increase of the level of business funding to two-thirds of total R&D investment.

target as the key objective for "all" Member States²³. Numerical targets of this type are often seen as inappropriate to measure research investments in different contexts, with different initial stocks of research capital and with different industrial structures. In a context of global innovation, a need emerges to measure progress towards long-term shared research agendas and to assess the impact on the competitiveness and research output in funding constituencies.



However, it holds true that underinvestment in research translates into lower competitiveness and its causes are to be found in poor framework conditions discouraging research and innovation. The current European framework and

national programmes for research still represent a fraction of what is needed, despite their positive *leverage effect* on national and private funding.²⁴

Efforts have been made through the introduction of the Competitiveness and Innovation Framework (CIP) to better link research to innovation and exploitation cycles²⁵. However, this funding instrument is rather modest compared to the challenge.

Other attempts include a declared willingness to better link the research phases to exploitation opportunities through public procurement, enhanced public private partnerships, venture capital and an improved synergy with structural funds. An

²³ EPC, 2008, Tackling Europe's innovation deficit, <http://www.weforum.org/pdf/GCR08/GCR08.pdf>

²⁴ It is estimated that direct funding from the EU represents between 4 and 5 per cent of research investments in the EU which overall still falls short of the estimated target 3 per cent of GDP. See Aho Group Report, *ibidem* and Gago Panel Report, *ibidem*

²⁵ European Commission, 2005, SEC(2005) 433, Commission Staff Working Document, Proposal for a Decision of the European Parliament and of the Council establishing a Competitiveness and Innovation Framework Programme (2007-2013), http://ec.europa.eu/cip/docs/sec_433.pdf

adaptation of current instruments, for coping with the changed nature of global research, is probably necessary at this stage.²⁶

4.1. A new model to boost research and innovation in Europe

As direct funding to research seems to progressively decrease in Member States ("direct government funding financed an average of 7% of business R&D in 2005, down from 11% in 1995"²⁷), the use of fiscal policy and tax-breaks is increasingly considered in order to reach the target of 3% GDP expenditure in research investments. Fiscal policies are also seen as better ensuring appropriate flexibility in rewarding innovation.

Within the current economic cycle a more active role of governments in the economy is likely to emerge. This can be an opportunity, if it will provide Europe with the chance of structural investments for competitiveness and innovation in the medium-run. It can also be a challenge if this process is not well managed in order to preserve the well functioning of the internal market, allocate government resources efficiently, and avoid anti-competitive behaviour.

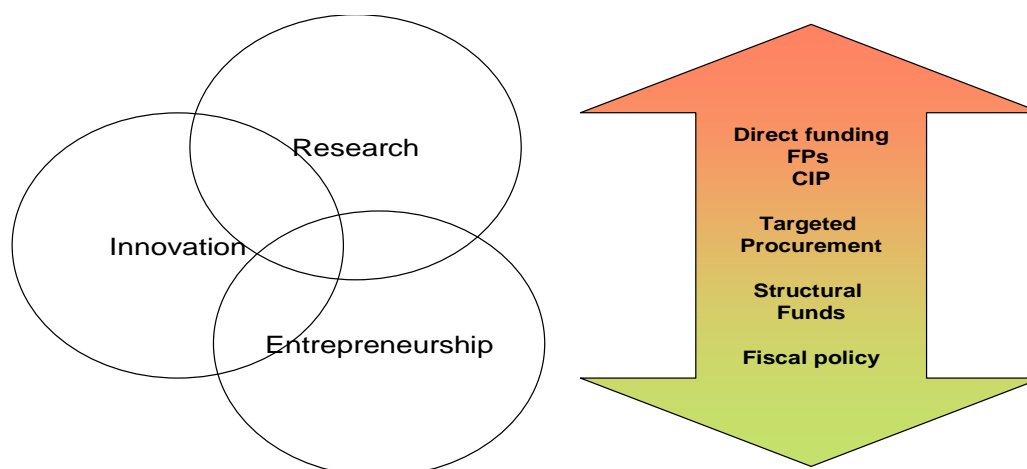
4.2. How to tune research instruments for the challenge?

Globalisation and new technological breakthroughs have reshaped the way research is performed. Increasingly companies look at research in systemic and holistic ways shifting from a focus on components to a focus on platforms and systemic solutions. Therefore, research/innovation ecosystems become key elements for promoting successful development and uptake of technologies.

²⁶ European Commission, 2009, COM(2009)116, A Strategy for ICT R&D and Innovation in Europe: Raising the Game, http://ec.europa.eu/information_society/tl/research/documents/ict-rdi-strategy.pdf

²⁷ OECD, 2007, *ibidem*

Figure 2: In the drive to reach competitiveness objectives of growth and jobs, research and innovation efforts need be linked to open innovation and entrepreneurship in funding constituencies. This would require a better fine-tuning of available instruments at EU level as well as better coordinated fiscal policies for research on the ground



This process has blurred the traditional division between the phases of research, innovation and entrepreneurial exploitation which are increasingly linked in a *continuum*.²⁸ Besides, in terms of developing competitive positions greater focus is given to entrepreneurship and creativity as key factors for innovation.

The EU has moved towards accommodating these needs by introducing a systematic approach in the framework programmes, establishing coherence in the small-sized actions in innovation (through the CIP) and in encouraging coordinated pre-commercial procurement at national and regional level (e.g. through the *lead market initiatives*).

Efforts have also concentrated on better exploiting the synergies between the EU's Seventh Framework Programme (FP7) and Structural Funds. The last CREST report²⁹ stated that "these instruments can help to mobilise research and technological development potential at regional, national and European level, and contribute to regional economic and social development much more effectively than if they were employed separately. Thus coordinated use of the Structural

²⁸ Intel, 2008, *Ibidem*

²⁹ CREST (1203/07, 2007, Guidelines on Coordinating the Research Framework Programme and the Structural Funds to support research and development

Funds and the Framework Programme for Research and Technological Development can help to achieve the aims of the Lisbon Strategy".

When coherently covering innovation ecosystems, *some initial attention has been paid to fiscal policies as a genuine bottom-up incentive scheme to undertake research, exploit innovation and create the conditions for competitiveness and job creation in the funding constituencies*. In a 2006 Communication³⁰ the European Commission has recognised the importance of fiscal policies to stimulate research. It also warned that "the growing diversity of R&D tax incentives risks further fragmenting the European corporate fiscal landscape and could lead to their less than optimal cross-border use. Therefore, a certain degree of coordination is needed to foster the effective use of R&D tax incentives across the EU and improve trans-national research cooperation given the increasing globalisation of R&D activities".

Fiscal policies for research would therefore require striking a balance between the need to better coordinate the *use of "automatic funding instruments" (such as tax breaks) to let innovation ecosystems emerge, while avoiding distorting the internal market*.

4.3. Towards fiscal coordination for research: positive and negative integration

Many OECD countries are increasingly turning to fiscal policy and tax breaks to fund research. The recent OECD Technology Scoreboard³¹ states that more and more member governments are giving firms tax breaks to drive innovation while cutting their direct spending on business research and development, and are also encouraging public research organisations to commercialise their inventions through tax incentives. However, fiscal incentives are still far from being used to

³⁰ European Commission, COM(2006) 728 final, Towards a more effective use of tax incentives in favour of R&D, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2006:0728:FIN:EN:PDF>

³¹ OECD, 2007 *ibidem*

structure the European research area as their coordination is rather limited despite enormous potentials.

In Europe, Spain is the country providing the largest tax break. However, the UK and the Netherlands are particularly generous to SMEs. For the UK, R&D tax credits are at the heart of the Government's strategy to raise levels of business investment in R&D and encourage business innovation by providing a tax incentive. The only country not using tax credits for research seems to be Germany.

The key concern is the compatibility of tax incentives with the internal market and state aids rules. So far the European Commission has limited itself to set some guiding principles.

What are R&D tax credits

“R&D tax credits” are measures which give companies additional tax relief for expenditure on R&D, beyond what they would be entitled to under the general principles of the tax system.

R&D tax credits vary – they may for example take the form of a reduction in the amount of tax payable (which might be received instead as a cash payment if the company is making a loss) or of a deduction from taxable income. They may be focussed on staff costs, or drawn more widely. And they can depend on the total spend on R&D (“volume” credits) or on some other measure, such as the rate of at which that spending increases (“incremental” credits).

A significant body of international evidence suggests that such R&D tax credits are successful in stimulating R&D spending by companies, not least because they leave investment decisions in the hands of companies themselves.

The type of tax subsidies available varies from country to country but include an immediate write-off of current R&D spending, as well as tax relief or allowances against taxable income.

Source: http://www.hmrc.gov.uk/ria/randd_largecompanies.pdf

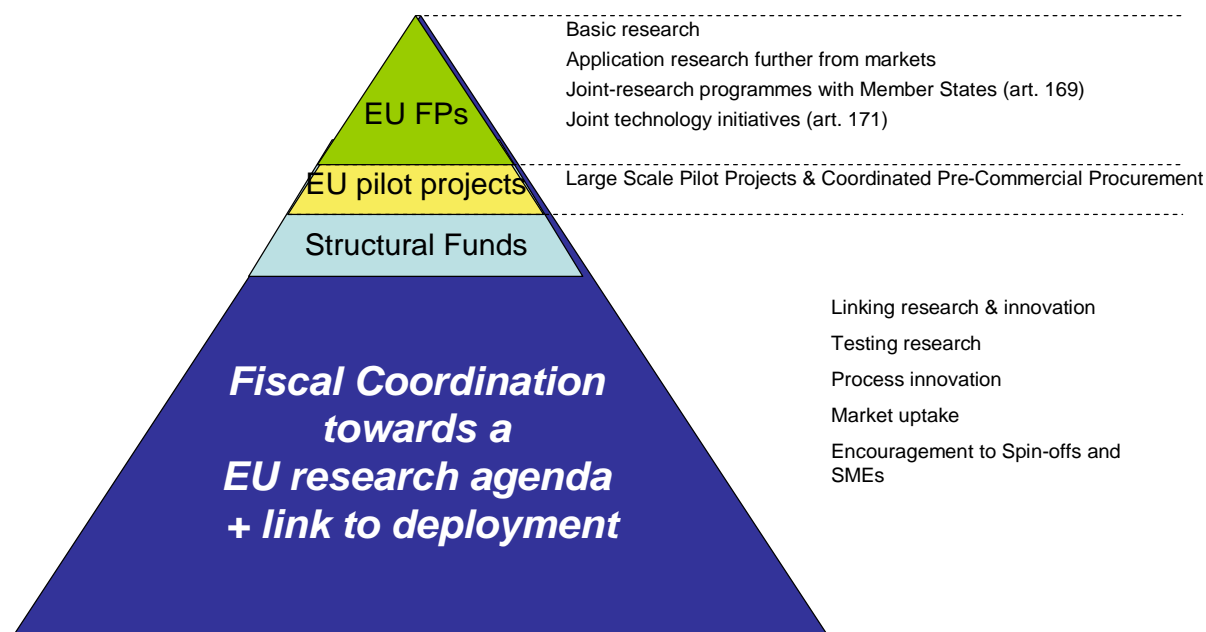
4.3.1. Strengthening the Open Method of Coordination (OMC) for fiscal policy in research

A case for reinforcing coordination capabilities at EU level therefore emerges together with the need to fine-tuning available direct funding with a more coherent use of fiscal incentives. Article 165 of the EC Treaty stipulates that "The Community and the Member States shall coordinate their research and

technological development activities so as to ensure that national policies and Community policy are mutually consistent. In close cooperation with the Member State, the Commission may take any useful initiative to promote (this) coordination (...)". This article constitutes the legal basis for a reinforced coordination in research efforts across the EU and can pave the way towards more enhanced fiscal coordination in funding research efforts. The framework for this type of coordination is provided by the existing "OMC in support of the Barcelona target" to improve and increase investment in research to 3% of GDP by 2010.

If fiscal policy is recognised as a key instrument for stimulating research, development and innovation, *the challenge will be in the coordination of this potentially large "pool of financial" resources into a coherent research effort in line with shared European priorities.*

Figure 3: The pyramid of research instruments. In seeking ways to better gauge research efforts and linking them to competitiveness outcomes EU policy should recognise the potential and complementarity of fiscal coordination.



I

n the meaning of regulatory economics, a policy of "*negative integration*"³² is established whereby Member States remove barriers for the establishment of cross-border initiatives. In the area of fiscal measures for research this would equal to allowing fiscal incentives to taxable entities while improving the coordination of their strategies and the monitoring of results.

An improved OMC in the use of fiscal policy for research has the potential to:

- Increase the effectiveness and flexibility of funding, while avoiding duplication of efforts at EU level, and adapting to near-to-market research and innovation needs;
- Achieve the necessary scale of research investments by incentivising large and small private research investments;

³² Positive integration is the approach based on new policy actions (including regulatory) aimed at structuring markets and providing economic and legal incentives. Negative integration refers to the removal of barriers or the voluntary cooperation in establishing a level playing field without introducing new measures. See: Jacques Pelkmans, 2006, *European Integration: Methods and Economic Analysis*, Third edition, Pearson Education - quoting Jan Tinbergen, 1954, *International Economic Integration*, North-Holland

- Encourage SMEs and smaller actors to invest in research and innovation.

Within a framework aimed to remove obstacles in the provision of tax breaks accompanied by a reinforced Open Method of Coordination, principles of achieving strategic goals of economic growth and competitiveness should prime over a focus on "blaming & shaming" non-performing countries under "arbitrary numerical targets"³³.

The framework of cooperation should be enriched by the definition of shared European research priorities which is now a mature exercise already performed for the Framework Programmes. Similar activities might be foreseen for extending the exercise to establish a common thematic agenda for fiscal cooperation in research. Given the scale of resources obtainable through fiscal cooperation, this instrument could focus on key challenges and priorities for Europe in adapting to the new global reality (for example priorities might be focusing on renewable energy, climate change, research for service solutions near to the users etc.).

4.3.2. The potential of State Aid law to structure the European Area of Research

A reinforced OMC on research however risks not being sufficient without the establishment of sound "boundary conditions" needed for a fiscal action to be deemed in EU interest. An enhanced OMC would have to look at ways to execute and monitor implementation of fiscal breaks to meet the goals of an agreed research agenda. Besides, in order to make use of fiscal policies to better structure the European research area and trans-national collaborations, the OMC will have to allow for simultaneous yet coordinated use of fiscal incentives to entities jointly investing in research efforts.

The temptation and need to use state aids in a period of recession or for national industrial aims is large, thus questioning the grounds for successful voluntary

³³ EPC, 2008 *Ibidem*

coordination among Member States (step 3 of subsidiarity test). State aid policy therefore need be vigilant so as to ensure level-playing-field among players in the internal market. Working on the "governance" aspects of fiscal policies for research and necessary coordination tools (*positive integration*, step 5 of subsidiarity test) is necessary from an internal market perspective in order to ensure conditions for level-playing field³⁴. It is especially suitable in order to achieve best synergies at EU level.

In order to achieve these targets, *negative integration* measures and a renewed OMC should be complemented by *positive integration measures* (including regulatory) capable of ensuring:

- the definition of a European Research Agenda in line with core policies and societal needs (e.g. in energy and climate change, ICT, health);
- the use of well defined common instruments setting the boundary conditions for application of tax breaks. These could materialise within the context of state aid rules on research;
- an effective monitoring system in terms of clearance of received fiscal incentives as well as in terms of assessment of achieved research targets.

It has been demonstrated that the way contracts are devised in Framework Programmes has helped structuring of research in Europe and has been the foundation for the European Research Area. These rules are based on the obligation for research entities to team up in groups comprising organisations from at least three European countries.

This system, despite its rigidities, has proved rather effective in creating multi-national consortia and leveraging private funding for research. The application of similar rules can also inspire the way "coordinated tax-breaks for research" in the

³⁴ In 2006 EU Court of First Instance judge Bo Vesterdorf warned on the use of tax laws to avoid EU investigation powers in state aids
http://www.era.int/web/en/html/nodes_main/4_1649_459/4_2153_462/events_0000_External_Press_Releases/5_2_508_3272.htm

forms of state aids are provided by Member States under specified boundary conditions (*positive* integration).

Current state aid legislation on research³⁵ sets out the conditions under which aid provided by Member States to foster research, development and innovation can be declared compatible. In particular aid must address a well defined market failure; it must be well targeted: it must be an appropriate instrument, as the aid measure must have an incentive effect and must be proportionate to the problem tackled; the distortions to competition and trade resulting from the aid measure must be limited³⁶.

However, the *above mentioned exemption falls short of possible use of fiscal incentives* (in the form of state aids) *as a means to help structuring the European research area* and encourage research results to be taken up in funding constituencies. To this purpose, adding some more specifications in the application of state aids law might prove fruitful.

More particularly, besides conditions imposed by current European legislation on state aids, a possible exemption may also include obligations for research entities to:

- Pursue research in line with the agreed EU research agenda "together with entities outside the national boundaries and within the EU";
- (Pre-)patent research results by reserving the right to patent inventions upon preliminary results. This would enhance the incentive to patent (which is lower in the EU). It will also protect intellectual property

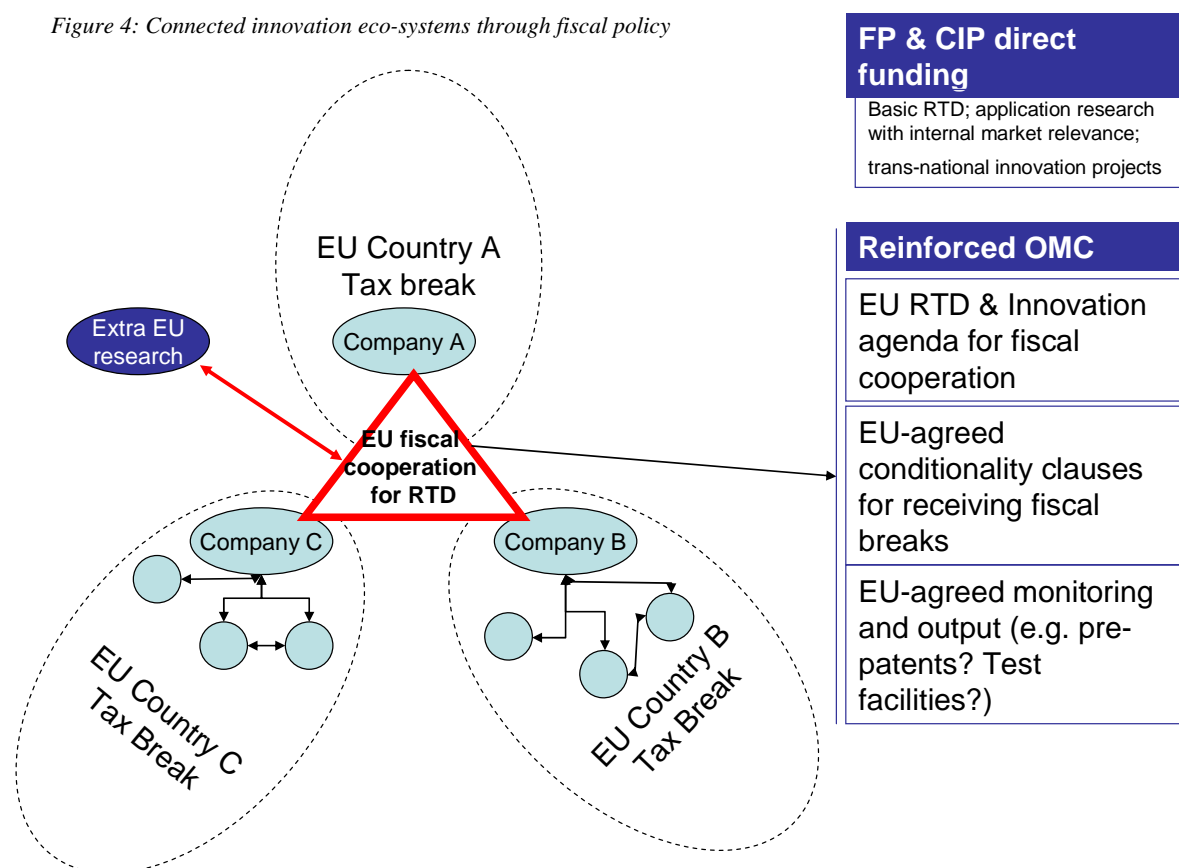
³⁵ European Commission, OJ C 323 of 30.12.2006, p. 1, Community framework for state aid for research and development and innovation, [http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52006XC1230\(01\):EN:NOT](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52006XC1230(01):EN:NOT)

³⁶ See also European Commission, OJ C83 of 07.04.2009, Communication from the Commission - Temporary framework for State aid measures to support access to finance in the current financial and economic crisis (consolidated version), allowing Member States to grant a lump sum of aid up to €500,000 per company until end of 2010, for certain categories of research and innovation (e.g. on environmental sustainability) without notification to the European Commission. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2009:083:0001:0015:EN:PDF>

rights on research results. It will also allow for better monitoring research developments justifying tax-breaks;

- Engage in "testing for innovation" and "exploitation" of research within the territory of the fiscal constituency. This would enhance the incentive to exploit research in local markets and produce conditions for enhancing competitiveness where research efforts are funded.

Figure 4: Connected innovation eco-systems through fiscal policy



4.4. Advantages for national governments

EU Member States are already using fiscal incentives for research and innovation and, as shown by recent evidence (OECD, 2007), this type of indirect funding is in some cases becoming the main one. Fostering improved coordination at EU level in the way fiscal incentives are provided to research entities will not necessarily translate into larger fiscal liabilities for the public purse. On the

contrary it will reduce the risk of technological duplications if incentives are provided for similar solutions without coordination in different member states³⁷.

Furthermore, if boundary conditions for the provision of fiscal incentives under state aid legislation are strengthened as suggested, measures will be introduced to encourage exploitation of research and innovation investments in the funding constituency with a more direct link to growth and jobs (which is not necessarily the case as regards direct funding for research).

4.5. Advantages for the European Commission

Some of the dividends from adopting the proposed approach would be on:

- Reducing "red-tape" associated with the management of complex contractual structures in the EU framework programmes. This might also allow to free resources from "near-to-market" research (in a changed "open research" environment) and devote more funding to basic research stimulating "technological breakthroughs";
- Creating the condition for best "leverage" and "coordination" of research expenditure in Europe by better tuning direct-funding to fiscally-supported research.

4.6. Advantages for the research community

The research community in Europe is varied and multi-faceted in terms of areas covered, local conditions for research, access to funding and dimensioning (e.g. spin-off SME vs. large corporations).

Framework Programmes have often the ambition of using a "one-fits-all" logic that does not respond to the needs of the many research and innovation players. Besides, the largest part of competitiveness-oriented RTD occur at the boundaries between application research, innovation and market exploitation.

³⁷ As for innovation, incentives can prove useful to share and replicate successful technological experiences from other EU countries

A research strategy based on the use of "a *EU common framework for coordinated fiscal breaks*" has the advantage to tailor strategic research needs to the means and needs of market players independently of their size and their positioning across value-chains. This would make research incentives more accessible to SMEs with enormous economic benefits as well as inject a "philosophy for innovation" within the European economic system.

4.7. International cooperation, global challenges and IPR

The described system can also be designed so as to enhance international cooperation in research on areas that concern global challenges (such as for climate change). In many areas, it is vital for the EU to link its research and innovation communities to major global research endeavours³⁸. This can occur through:

- The determination of agendas for international cooperation in basic research to be best suited at the EU level (e.g. the case of ITER)
- Encouraging "coordinated fiscal cooperation" for funding research links with third countries in specific areas deemed strategic for the EU.

An improved European IPR protection and patenting system is also a key element for delivering better incentives for research, even more so in a context which relies on the use of fiscal breaks. In this regard, the promotion of the EU "*fifth freedom* (mobility of knowledge)" also "needs a more ambitious agenda. Enabling researchers to move more freely around the EU and creating the European Research Area are only first steps. Preparing the Single Market for the knowledge economy requires much more fundamental change, recognising the importance of knowledge as the underlying asset and driver of future growth"³⁹.

³⁸ For example, billions of Euro are currently being spent in the US, Gulf countries, China and India to demonstrate renewable energy technologies

³⁹ EPC, 2008, *ibidem*. In this regard, the Commission adopted, on 20 March 2009, a Recommendation to the Council to authorise the Commission to open negotiations for the adoption of an Agreement creating a Unified Patent Litigation System. See: Council of the European Union, Progress Report 9549/09, 8 May 2009, <http://register.consilium.europa.eu/pdf/en/09/st09/st09549.en09.pdf>

5. Conclusions

The research environment in Europe is rapidly changing welcoming new ways of conducting research and innovation at a global scale and in an "open and user-centric" fashion.

The current recessionary cycle might ask for active economic stimulus from the EU and national governments. A fruitful way to provide for long-lasting structural innovation is through investment in research.

In order to cope with the changed nature of research patterns, a greater case for a "coordinated fiscal policy" for research is emerging and can prove flexible enough to adapt to the needs of new research and innovation patterns, while providing new economic impetus.

Such a system would call for measures based on a strengthened Open Method of Coordination and on improved state aids rules for research investments. The combination of both would yield the assurance of "level-playing-field" at EU level in terms of fiscal incentives for research, a functioning European Research Area, a good exploitation of research results and competitive outcomes in funding constituencies.

This would allow the EU to reduce red-tape in the management of existing framework-programmes while concentrating on the establishment and maintenance of the EU Research Agenda, on break-through research in areas which are furthest from markets and on projects clearly enhancing the internal market for products and services.

At the same time such a system would allow for more flexible configurations of private research actors in near-to-market research while promoting the link to innovation and entrepreneurship in funding constituencies.

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