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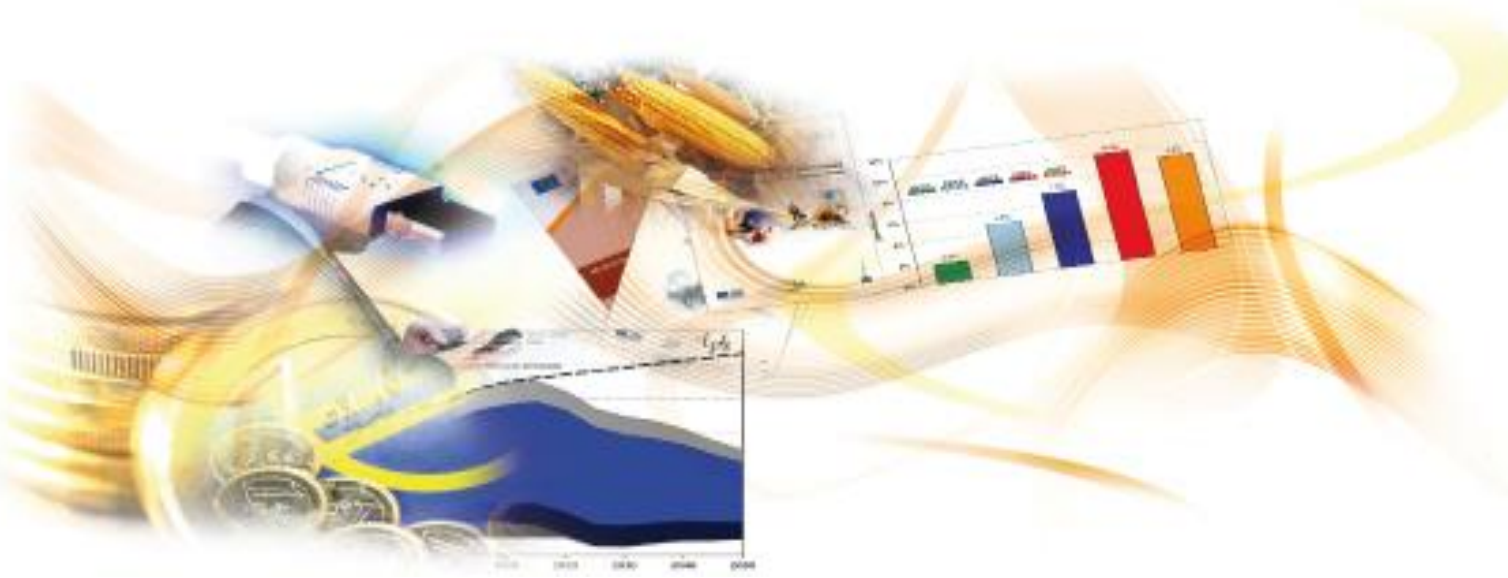

5th European Conference on Corporate R&D and Innovation – CONCORDi 2015

Industrial Research and Innovation: Evidence for Policy

Background Note

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Abstract
This background note offers first a synthesis of the main research questions addressed under the three topics of the 5th European Conference on Corporate R&D and Innovation - Industrial Research and Innovation: Evidence for Policy (CONCORDi 2015). Section II positions the selected papers in the current academic literature. It focuses on the extent to which the papers address the main issues, and on how they strengthen and challenge what we know about *evidence for industrial R&D and innovation policies*. Section III briefly presents the key priorities of the European innovation and industrial policy and some examples of current programs to support corporate R&D and innovation activities. Section IV raises a series of research and policy issues the Conference will address.
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European Commission
Joint Research Centre – Institute for Prospective Technological Studies

5th European Conference on Corporate R&D and Innovation:

Industrial Research and Innovation: Evidence for Policy
- CONCORDi 2015 - [1]

Background Note

Mafini Dosso, Fernando Hervás and Pietro Moncada-Paternò-Castello[2]

I. Introduction

The key role of an innovative industry for the creation of future jobs and growth have led policy makers at European, national and regional levels to design and implement specific policies to support industrial research and innovation. At the EU level, the Europe 2020 strategy and its Innovation Union and Industrial Policy flagship initiatives[3] constitute the main policy frames for such interventions. They put forward industrial R&D and innovation as key drivers of a smart, inclusive and sustainable growth (European Commission, 2010)[4].

The view of innovation as part of the solution to societal challenges and the scientific advances in the understanding of innovation have broadened the scope of innovation policy making. The mainstream rationale for public support to industrial research and innovation is anchored in the well-known market failures framework. Typically they refer to situations where firms' individual behaviours do not lead to socially desirable outcomes. In a pure market failures approach, innovation policy is only justified in order to ensure that markets will adjust back to the "equilibrium path". In this perspective, corrective public actions target the market deviations from the equilibrium resulting from the imperfect competition, the public nature of knowledge, information failures, negative externalities[5] and coordination failures. The market failures argument has favoured the early design of narrow innovation policies targeting R&D and patents-based indicators (Landry and Amara, 2012; Mazzucato et al., 2015). A now quite extensive corpus of studies, which stress together the importance to consider the micro

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[1] CONCORDi 2015 was organised by the European Commission, JRC-IPTS on 1-2 October 2015 in Seville (Spain). See the Conference website: http://iri.jrc.ec.europa.eu/concord/2015/index.html

[2] All authors are from the European Commission, Joint Research Centre – Institute for Prospective Technological Studies

[3] Section III provides a brief description of the key priorities under the Innovation Union and Industrial Policy flagship initiatives and some examples of the EU policy support to corporate R&D and innovation.

[4] In the context of this note, the *industrial and innovation policy* refers to the set(s) of policy instruments and programmes implemented mainly to support the R&D and innovation in manufacturing and services industries, acknowledging that both terms, "industrial" and "innovation" policies, may encompass a broader range of distinct topics and policy interventions.

5 Negative externalities occur when the activities of firms result in negative effects on other firms or individuals, such as air and water pollution or more generally the activities that threaten the environmental sustainability.

foundations and the institutional context of the innovation dynamics[6], has challenged the traditional approach to innovation policy making. These works mainly call for a more systemic approach to innovation and innovation policy that accounts for the many factors, interactions and the heterogeneity of actors that influence innovation activities and outcomes (Smits et al., 2010). These arguments have gradually echoed in policy circles. On the one hand, they have favoured the development of more systemic instruments and programs targeting the framework conditions for innovation, the interactions between actors, and more recently the diffusion and commercialization of firms' innovations (see for instance Horizon 2020, OECD countries reviews[7]). On the other hand, several efforts at the international and European levels have been implemented to develop standards in the measurement and interpretation of R&D and innovation as for instance, the Frascati manual of the OECD, the Community Innovation Surveys, and the OECD-Eurostat's Oslo manual. In parallel, continuous efforts to monitor innovation performances and to evaluate industrial and innovation policies are either planned or taking place (European Commission, 2011, 2013, 2014b, 2015b).

In spite of the knowledge accumulated so far on innovation, its processes in the industry, its measurements and on the evaluation of related policies, important issues remain open. The first issue relates to the capacity of current indicators and theoretical frames to account for the complexity of the innovation, their multiple determinants and effects. A second set of issues relate to the nature and scope of the evidence provided, or the extent to which they can adequately inform policy making in the area of industrial research and innovation. Third, the evidence and scientific findings themselves can be questioned on the grounds of, among others, their transferability and predictive value, the realism of underlying assumptions and the hierarchy of methodologies (i.e. randomized control trials, cross-industry studies, case studies, surveys, etc.). Also, the validity of traditional assessment tools and methods for policy purposes are subjected to closer scrutiny. Indeed the risks of misleading policy implications increases with the level of abstraction of complex real-world issues – here of the processes of corporate R&D and innovation (Nowotny, 2007; Aghion et al., 2009; Saltelli and Funtowicz, 2014). Another simple, although fundamental, question is how well-equipped is the academic community to address the industrial and innovation policy challenges. Last but not least, are the issues raised by the operationalization and the conditions to successfully translate evidence on corporate R&D and innovation into meaningful and successful innovation policies[8]. In a nutshell, turning evidence into policy is a difficult task. Consequently, calls for an evidence-based innovation policy are now widespread. And, the demand for adequate measurement frames and indicators for industrial R&D and innovation activities, their outcomes and for *ex-ante*, *intermediary* and *ex-post* innovation policy evaluations has never been so prominent.

Against this background, CONCORDi 2015 aims at discussing the role of scientific analyses in the design and implementation of an EU industrial policy based on research, innovation and technological advancement. The use of scientific evidence to support policy is a topic of high policy relevance in the context of the EU better regulation agenda, which calls for the best evidence to support policy design, implementation and evaluation (ESF, 2012; European Commission 2014a, 2015a). The budgetary constraints, especially following the crisis, and the recognition of innovation as a complex process of value creation, have accentuated the need for more comprehensive, effective and evidence-based innovation policies.

[6] See the early seminal works of Nelson and Winter (1982), Dosi (1988) on the microeconomic characteristics of innovation processes and of Lundvall et al. (1992), Cooke (1996) and Edquist et al. (1997) on the systems of innovation.

[7] See the official site of the European innovation funding program Horizon 2020 at http://ec.europa.eu/programmes/horizon2020/en/what-horizon-2020 and the OECD's series on the Governance of innovation systems and Reviews of innovation policies at http://www.oecd.org/sti/sci-tech/governanceofinnovationsystemsvol1synthesisreport.htm

[8] See also Landry and Amara (2012) for a series of concrete examples of typical dilemma faced by policy makers in the implementation of innovation policies and the related theoretical arguments.

In line with the importance of evidence-based approach for a better regulation, the discussion will take place against the policy frame of a renewed EU agenda to boost Jobs, Growth and Investment as highlighted in Juncker Commission's top priorities and to the related 'Industrial Policy' agenda (European Commission, 2014c, d). Drawing on the experience accumulated from internal monitoring and analyses[9] on the dynamics of corporate R&D and innovation, the key broad issues identified to frame the debates are:

(i) What are the current and up-coming EU policy challenges in the area of corporate R&D and innovation for its contribution to industrial competitiveness, employment and social well-being?

(ii) To what extent can the evidence on corporate R&D and innovation support policy-makers to address such challenges?

(iii) How to provide a proper assessment of the impact of industrial R&D and innovation policies on competitiveness, employment and well-being?

These issues were identified following the call for papers of CONCORDi 2015 released earlier this year. Nine papers out of more than fifty submissions were selected by the Scientific Committee of CONCORDi 2015. In addition of these selections, two keynote paper presentations, and the six invited papers, all from the Scientific Committee, have been integrated in order to structure the Conference into thematic sessions.

The Conference will address the main issues in three thematic Plenary Sessions[10].

Plenary Session I will address key issues on the theory, measurement and evidence on corporate R&D and innovation dynamics and on their relevance for policy making purposes. Particularly, the importance of adequate theoretical and analytical frameworks and of proper access and use of firm level data will be discussed. **Plenary Session II** will tackle issues related to the role of entrepreneurship, to firms' behaviour and performances, and to the current implementation of territorial innovation policies. It will aim at an in-depth reflection on the underlying assumptions and expectations of the existing conceptual policy frames and programmes. **Plenary Session III** will discuss the use of evaluation in policy making, focusing on the assessment of the additionality of public interventions supporting corporate R&D and innovation.

This background note offers first a synthesis of the main research questions addressed under the three topics of the Conference. Part II positions the selected papers in the current academic literature. It focuses on the extent to which the papers address the main issues underlined above and strengthen or challenge the prevailing knowledge on the topic. Part III briefly presents the key priorities of the European innovation and industrial policy and some examples of current programs to support corporate R&D and innovation activities. Part IV raises a series of research and policy issues to be addressed in the Conference.

II. State of the Art

2.1 Theory, measurement and evidence on corporate R&D and innovation dynamics

The importance of the policy support to enhance knowledge and innovation supply primarily reflects the wide spread theoretical argument that under uncertainty, expectations of firms are

[9] The Economics of Industrial Research and Innovation (IRI) scientific project carried-out by the Joint Research Centre of the European Commission provides the EU policy-makers and the business and academic communities with robust empirical evidence and analysis on the contribution of private-sector R&D to the growth and employment of the European economy. The main activities of the mentioned IRI project are a result of a close co-operation between the Joint Research Centre (JRC) and Research & Innovation (DG-RTD) Directorates-General of the European Commission.
See at http://iri.jrc.ec.europa.eu/home for detailed information on the works of IRI.

[10] The annex I provides texts-based highlights of the invited and accepted papers/abstracts. The annex II gives the programme of the Conference and annexes III and IV contains the members of the scientific and steering committees and bios.

rather timid, primarily due to the limited appropriability, non-rival nature and indivisibility of knowledge (Arrow, 1962; Antonelli, 2009). This rationale has also for long influenced the way initial indicators and empirical settings, reflecting the determinants and the processes of knowledge creation and innovation, have been conceived (Aghion, 2009; Mazzucato, 2015). Despite their limitations, traditional R&D-based measures serve as the main basis for assessing corporate innovation inputs and for international comparisons. However the importance of R&D intensity greatly depends on the industry context (Mathieu and van Pottelsberghe de la Potterie, 2010; Moncada-Paternò-Castello, 2010). In addition, this indicator misses the transformation of inputs into outputs, which may lead to an overestimation of unproductive R&D. Likewise the consequences of R&D activities are still often captured through the measurement of narrow output indicators (e.g. patent counts) and direct economic outcomes[11]. Paradoxically, on the one hand, it is recognized that the determinants of innovation are multiple, interrelated and yet, many are still to be identified (Edquist, 1997). On the other hand, the effects of R&D and innovation extend well beyond changes in firms or country socio-economic performances and are fundamentally of a multidimensional nature. For instance, the widely accepted labour-friendly effects of innovation are not straightforward, as other opposite forces might be at play depending on the type of innovation and the industry (Harrison et al., 2014; Vivarelli, 2014).

More, industrial innovation policies interact with other areas of policy regulation and intervention (labour markets, human capital formation, environment, taxes, standardisation, etc.), thus increasing the difficulty to assess their effects and the likelihood of unexpected effects.

Furthermore, R&D and innovation intensity indicators are increasingly employed also in the formulation of targets for policies stimulating research and innovation to economies at different stages of development. However in this respect, national policymakers have to take into account that often the bulk of R&D and innovation is conducted by companies that mostly operate on a global scale (Moncada-Paternò-Castello and Smith, 2009). The international comparisons should be based on appropriate indicators and statistics leading to solid evidence-based policy making. Unfortunately, the statistical coverage of financial and knowledge flows managed by multinational enterprises (MNEs) involved in R&D and innovation, outsourcing/off–shoring is often very poor or non-existent (Perani and Cozza, 2006)

Much progress has been achieved both in the collection of micro level data and the updates of econometric methodologies in order to better account for heterogeneity and endogeneity associated to the modelling of R&D, innovation activities and their effects. However so far commonly used indicators and theoretical approaches still bear many limitations. Unfortunately, such tools and frames are likely to lead to or encourage short-sighted innovation and industrial policies or policies doomed to be confined in the boundaries set by the prevailing techno-economic paradigm (Mazzucato, 2015). The availability of adequate data and conceptual approaches of innovation dynamics and effects are of primary importance for the design, implementation and evaluation of industrial research and innovation policies. Particularly, for the latter, this would include the access to and use of quantitative and qualitative firm level data on innovation and complementary aspects of firms' behaviours, attributes and strategies that still remain to be identified and/or measured.

Departing from these fundamental issues, the invited and selected papers in the **Plenary Session I** offer relevant alternative theoretical and empirical perspectives to rethink some important conceptual and measurement aspects of knowledge, corporate R&D and innovation dynamics and outcomes.

The first invited paper (by Antonelli) deals with a fundamental property of knowledge, its limited appropriability, and brings light on the related misleading assumptions of under-supply of knowledge. Policy implications point to the importance of supporting the diffusion of knowledge and enhancing the knowledge connectivity of the system. The second invited paper

[11] See Hall et al., 2010 for a review.

(by Moncada-Paternò-Castello) takes grounds on the so-called EU-US corporate R&D intensity gap. The paper proposes an empirical assessment of the intrinsic and structural causes of the R&D intensity differences between companies of the Triad. It further relates the sectoral dynamics with the specific demographics of top R&D investing firms. Analysis of such data allows for international comparisons of R&D performance at the micro-level during the last decade, and suggests possible policy implications.

The first selected paper (by Andries, Hoskens, Janger, Rammer and Schubert) discusses the relevance of the new Innovation Output Indicator developed by the European Commission. In a comparative perspective, the analysis is grounded on the difficulty to measure innovation outcomes and the limitations this may entails in informing innovation policy making. Avenues for improvements are also suggested. The second selected paper (by Van Roy, Vertesy and Vivarelli,) tackles the issues of the job creation effects of innovation in a EU-wide panel dataset of firms. Policy implications related to the sectoral heterogeneity and the importance of the quality of innovation are underlined. Exploiting firm level data from the CIS, the third selected paper (by Blind and Rainville) focuses on demand side innovation policies and sheds light on the individual and interactive effects of innovation and standardisation as determinants of public procurement receipts in Germany.

2.2 Entrepreneurship, firms' performance and territorial innovation policies

The concept of knowledge-based economy emphasizes the role of intangible assets as key engines of the competitiveness and growth of territories. On the one hand, this has challenged the traditional role of knowledge-oriented actors, such as universities and higher education organizations, and has increased the demand for a market-oriented knowledge production (Lester, 2005; Mowery and Sampat, 2006). Partly in response to their new missions, universities have undergone deep transformations including the development of applied programs and a greater involvement into the diffusion and commercialization of university research for instance, through clusters and science parks, technology and knowledge transfer units, collaborations with the industry and academic entrepreneurship. Universities are now seen as a key contributor to local economy development (Tödtling, 2006).

On the other hand, the idea of the knowledge economy has translated into specific innovation policies aiming to further enlarge the corporate intangibles assets and facilitate their diffusion and exploitation. Several governments have already or are implementing favourable tax treatments for R&D and patenting activities (e.g. R&D tax credits, patents subsidies and patent boxes) in order to foster and attract knowledge-intensive activities on their territories. The support to knowledge creation and firms' intangibles in general reflects the no-less-strong belief that these stimuli would accelerate the creation and diffusion of innovations and the development of high-growth, and supposedly profitable, innovative firms or entrepreneurial successes. This in turn would bring more employment and growth in the local economies.

Few arguments to nuance this reasoning should be underlined. First, at the firm level, the link between innovation and growth are not straightforward and can be asymmetric (Geroski and Mazzucato, 2002; Audretsch et al., 2014). Beyond the more philosophical question of "what do entrepreneurs and firms want?", the mixed evidence call for a careful attention on how firm innovation dimensions and growth (e.g. sales, employment, profits, market value, etc.) are apprehended and how the aggregated effects are estimated. A related fundamental issue concerns the risks for a misuse or misinterpretation of the existing evidence in the policy frameworks and decision making or the lack of appropriate evidence-based frameworks in the evaluation, design and implementation of innovation policies. Last but not least, there is the issue of how to anticipate and prevent the negative effects that individual corporate innovative behaviours and strategies might have in the attainment of policy desirable social outcomes.

The papers in the **Plenary Session II** tackle these issues from different perspectives. They offer relevant contributions to our understanding of the performances, the dynamics and the complexity of innovation dynamics, and of the (mis)use of evidence in territorial innovation policy making frames and concepts.

The first invited paper (by Audretsch) focuses on the new market-oriented missions of universities and discusses the conditions for the entrepreneurial university to contribute to the development of regional innovation systems. Policy conclusions relate to the importance of entrepreneurial universities with porous boundaries. The second invited paper (by Brännback) addresses fundamental issues about the misinterpretation of evidence and the shortcomings of innovation policy assumptions and frameworks in the context of firm growth and entrepreneurship.

The first selected paper (by Alstadsæter, Barrios, Nicodeme, Skonieczna and Vezzani) provides an original assessment of the effects of patent boxes regimes on corporate patenting strategies, in the European context. Relying on a sample of top R&D investors worldwide, the study disentangles the effects associated with different patent boxes modalities. At the policy level the findings support the introduction of development conditions to guarantee that research activities are effectively undertaken, balancing tax motivations. The second selected paper (by Bianchini, Pellegrino and Tamagni) exploits the Spanish Technological Innovation Panel (PITEC) and a wide set of innovation indicators. It contributes to the literature by adopting a richer set of innovation dimensions and up-to-date quantile regression techniques. The study provides novel empirical evidence on the relationships between success on the market and innovation inputs, outputs and new knowledge sourcing modes. The third selected paper (by Dosso and Hardeman) addresses the conceptual challenges and shortcomings in the operationalization of the innovation policy concept of Smart Specialisation from an evidence-based perspective. Building upon the prior reflections on evidence-based policy and its antecedent, evidence-based medicine, the paper discusses the challenges of an evidence-based research and innovation policy and underlines important implications for the science-policy interface.

2.3 Impact of public policies and their additionality in supporting corporate R&D and innovation

The higher demand for public funds and the budgetary constraints have increased the pressure on governments to ensure that public policies generate demonstrated returns. The effectiveness and efficiency of innovation policies greatly depend on adequate and systematic evaluations undertaken at the different stages of the policy cycle. Evaluation is now considered as a necessary condition for the design of evidence-based public policies in general (EC, 2015a), and in the area of industrial research and innovation, in particular (OECD, 2010). Evaluations should inform policy makers not only on what works, but also on what does not work and the conditions under which interventions work or under which they do not work.

Earlier impact assessments of innovation policies have focused either on the input or the output additionality of public support to R&D and innovation activities. Additionality occurs when the government intervention leads to an increase in the innovative activities of firms. Input additionality refers to the changes in private R&D investments while output additionality reflects the increase in innovation outputs (e.g. patents) or outcomes (e.g. sales). In other words, there is additionality if the increase would not have taken place in the absence of public R&D support. This definition intrinsically implies that a key methodological issue in the additionally literature relates to the ability to assess also the counterfactual (Georgiou, 2002; Söderblom et al., 2015). Based on the neoclassical rationale for public intervention, the focus on the resources and results effects entails several limitations that may result into unappropriated policy recommendations or instruments. Two important issues concern the failures to apprehend the non-linearity in the innovation investments-output relationships and the lack of a consensual approach to output additionality (Clarysse et al., 2009). Not less relevant limitations include

their inaptitude to inform on the intermediary steps between the R&D and innovation or to account for the potential impact of different corporate R&D management processes. An additional limitation results from the failure to account for the indirect and more complex effects of innovation policies.

Partly in response to this dichotomous approach to additionality, a flourishing literature in the evolutionary tradition has focused on the behavioural additionality of innovation policies. In this perspective, public support may give rise to complementary effects besides increases in resources and results, and the impact can extend beyond short term effects. These effects reflect the changes in the behaviour[12] of firms following public R&D support (Bruissenet et al., 1995). Indeed innovation policies can also influence the firms' capabilities and learning curves, the economic signals they face, as well as their interactive behaviour (OECD, 2006; Edler et al., 2013; Cimoli et al., 2015). In this framework, the concerns for governments are not limited to the additional spending incurred by innovation policies, but include also the way their different actions influence corporate behaviours and strategies (e.g. R&D management, cooperative behaviour, etc.). For these concerns, traditional evaluations cannot do much (OECD, 2006).

Building upon these new challenges, the papers in the **Plenary Session III** adopt a broader perspective on the effects of industrial and innovation policies. They contribute to enhance our knowledge on the use of evaluation for policy making and on the wider additionality effects of public support to R&D and innovation.

The first invited paper (by Borrás) adopts a novel and complementary perspective on the issue of research and innovation policies' evaluation. Contributing to the vacuum of the literature on policy makers learning, it discusses the use of evidence from evaluation studies and elaborates an analytical framework from the policy learners' perspective. Policy messages stress the importance of different learning modalities and their implications for the use and value of research evaluation. The second invited paper (by Edquist) tackles the conditions for the public involvement into corporate innovation funding, i.e. for additionality to take place. Drawing upon the Swedish experience, the paper points at typical failures in the governance of public risk capital funds; that is when duplication or crowding out effects are taking place. Corrective policy actions are suggested in order to enhance early-stages private capital, and shift or adjust the intervention stage of public funding.

The first selected paper (by Demeulemeester and Hottenrott) uses a panel dataset of R&D and non-R&D performing firms to assess the effects of government R&D subsidies on the cost of debt. Different types of effects are disentangled including the resources, certification and formation effects. In line with the findings, the paper brings further support to the additionality effects of public R&D policies, and suggests continuity in the provision of research subsidies to small and young firms. The second selected paper (by Radicic, Pugh and Douglas) addresses the issue of cooperation additionality. It assesses the impact of public support on different types of firms' innovation cooperation in a dataset of Europe-based SMEs. In addition, of matching estimation, the paper introduces sensitivity analysis to assess the robustness of identified effects. The findings point to a broader policy support for SME cooperation for innovation. The third selected paper (by Neicu) considers the additionality effects of innovation policy mixes. It assesses the effects of a combination of R&D tax credits and subsidies in a sample of Belgian firms. Policy implications highlight the potential effectiveness of firms' combination of direct and indirect R&D support.

[12] See OECD (2006) for the multiple dimensions of behavioural additionality and country case-studies.

III. Key priorities of the European innovation and industrial policy

The support to corporate R&D and innovation activities is a major element of the **Europe 2020** strategy, which aims at stimulating smart, sustainable and inclusive growth in Europe. The European growth strategy is outlined around five main Headline targets in the areas of employment, R&D investment, energy/climate, education and poverty. In addition, seven flagship initiatives are defined under the priority themes. They include the '*Innovation Union'*, '*Youth on the move*', '*A digital agenda for Europe'*, '*Resources efficient Europe'*, '*An industrial policy for the globalisation era'*, '*An agenda for new skills and jobs'* and the '*European platform against poverty'* (European Commission, 2010).

In line with the main focus of the CONCORDi 2015 Conference "Industrial Research and Innovation: Evidence for Policy", this section briefly recalls the priorities of the European innovation and industrial policies and some examples of the EU innovation policy instruments. The focus will therefore be put on the concrete subsets of measures targeting the support of corporate R&D and innovation activities as presented in the main corresponding flagships, the 'Innovation Union' and 'An industrial policy for the globalisation era', as well as the new Investment Plan launched under the auspices of president Juncker. The objective and challenge is to make all these initiatives work together, as part of the comprehensive agenda to support jobs, growth and investment in Europe.

The **Innovation Union** considers the R&D and innovation activities as the privileged and smart path to respond to the grand societal challenges. The Innovation Union aims at creating an innovation-friendly environment that facilitates the commercialization of new ideas and innovations in order to foster growth and jobs. Several actions targeting corporate R&D and innovative activities are already undertaken or planned to be implemented. Most of them are reflected in the commitments of the European Commission (EC 2010), which aim to:

- ✓ Stimulate the increase in private innovation activities mainly through the funding support provided in the EU research and innovation programme, Horizon 2020 (see examples in box 1 below);
- ✓ Improve the framework conditions for innovation;
- ✓ Support the uptake or commercialization of innovations on the markets;
- ✓ Foster the entrepreneurship, the investments in start-ups and the involvement of SMEs in EU research and innovation programs;
- ✓ Promote the knowledge diffusion, the cooperation and networking for innovation;
- ✓ Strengthen the industry-academy collaborations and knowledge and technology transfer;
- ✓ Stimulate the corporate innovation activities through public procurement for innovation;
- ✓ Accelerate the standards setting to enable interoperability and foster innovation in fast-growing markets.

The **Industrial policy flagship** defines the European policy strategy for a more dynamic, competitive, sustainable and modern EU industry. The main priorities for the industrial policy are set out in the communication "For a European Industrial Renaissance" (European Commission, 2014c). They reflect the Commission commitment for an "Industrial Renaissance" that requires the modernisation of Europe's industrial base across all industrial sectors. The priorities can be underlined as follows:

- ✓ Improve the market integration through better integrated information, energy and transport network, markets for goods and services and the business and regulatory environments;
- ✓ Modernize the EU industry through the investment in innovation, production inputs and the upgrading of skills. Under this priority, six strategic priorities have also been identified including advanced manufacturing, Key Enabling technologies (KETs), bio-based products, clean vehicles and vessels, sustainable construction and raw materials and smart grids and digital infrastructure. The EU industry modernization also aims at a better productivity and resources efficiency of the EU industry and at an improved access to affordable finance, energy and raw materials;
- ✓ Support to SMEs and entrepreneurship through the reduction of regulatory and administrative costs, of the barriers to growth, a better integration into excellence clusters and global value chains as well as dedicated entrepreneurial training;
- ✓ Promote the internationalization of EU firms through a better access to world markets and the support to standards setting and regulatory cooperation.

The EU overall strategy for jobs and growth will also be supported by the recently launched **Investment Plan** (European Commission, 2014d) and the establishment of a new European Fund for Strategic Investments (EFSI) aiming at mobilising public and private resources to be invested in strategic areas including among others research, innovation and education, as well as risk finance for small businesses. Other priorities of the Juncker Commission will also contribute to support a strong and modern industrial innovation agenda, such as the establishment of a Digital Single Market, and of an Energy Union.

Horizon 2020 is the main EU Research and Innovation programme for the period 2014-2020, which targets the excellence in science, the industrial leadership and the development of solutions to the grand challenges. Horizon 2020 is the main financial instrument for the implementation of the Innovation Union flagship. Under the programme, dedicated support has been designed to foster the corporate R&D and innovation activities. Some of them are described in Box 1 (next page).

In addition, the European Structural and Investment Funds[13] (ESIF) will devote important financial resources to support EU research and innovation policy priorities in the context of the EU structural and cohesion policy. In order to benefit from such investments, national and regional authorities have been requested to prepare Research and Innovation Strategies for Smart Specialisation (RIS3 strategies). RIS3 are integrated, place-based economic transformation agendas which aim at focusing policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development. In this context they support technological as well as practice-based innovation and aim to stimulate private sector investment.

In the context of this extense policy agenda, the proper monitoring and evaluation of EU and Member States' research and innovation policies acquire strong relevance. As part of the yearly cycle of economic policy coordination called the **European Semester,** the implementation of the Europe 2020 and its related flagship initiatives is monitored. The progress at the EU level is evaluated and national reform programmes, which include research and innovation policies, are evaluated and, when required, country specific recommendations are provided.

[13] See at http://ec.europa.eu/contracts_grants/funds_en.htm

Box 1 - Examples of corporate R&D and innovation support at the European level under the Horizon 2020 program

- **Fast Track to Innovation (FTI)** finances the commercialisation process and encompasses the demonstration stage, including piloting, test-beds, systems validation in real world/working conditions, validation of business models, pre-normative research, and standard-setting. It targets relatively mature new technologies, concepts, processes and business models that need a last development step to reach the market and achieve wider deployment.

- **SME INSTRUMENT** targets highly innovative SMEs to enhance their growth potential. It offers lump sums for feasibility studies, grants for an innovation project's main phase (demonstration, prototyping, testing, application development...) and provides facilitated access to debt and equity financial instruments for the commercialization. Under this instrument, examples of funding lines include ***(i)*** SMEs efforts for the development - deployment and market replication of innovative solutions for blue growth; ***(ii)*** Open Disruptive Innovation Scheme*;* ***(iii)*** SME business model innovation ; ***(iv)*** and several technology-oriented themes in nanotechnologies, biotechnologies, diagnostic medical devices, advanced materials or advanced manufacturing and processing technologies, energy and raw materials, transport and urban infrastructure, etc.

- The **contractual Public-Private Partnerships (cPPP)** aim at triggering additional private investments to develop new technologies, products and services. The 8 cPPP target the following strategic areas: Factories of the Future, Energy-efficient Buildings, European Green Vehicles Initiative, Sustainable Process Industry, Photonics, Robotics, High Performance Computing and Advanced 5G networks for the Future Internet.

- The **Joint Technology Initiatives*** **(JTI)** are part of the Investment package which aims at leveraging private investment in strategic areas for the EU. The new JTI are active in: Innovative Medicines 2 (IMI2), Fuel Cells and Hydrogen 2 (FCH2), Clean Sky 2 (CS2), Bio-based Industries (BBI), Electronic Components and Systems for European Leadership (ECSEL) and Single European Sky ATM Research (SESAR) 2020.

For more information on the HORIZON 2020 program, see at
http://ec.europa.eu/programmes/horizon2020/

* *http://ec.europa.eu/research/jti/index_en.cfm?pg=home*

In the area of research and innovation policies, one important priority is to increase the impact and value for money of public intervention. A series of priority axes for reform of Member State's research and innovation systems has been established (European Commission, 2014a) and specific instruments to provide support to the implementation of these agendas has been established (such as the Policy Support Facility established in the context of Horizon 2020 and including technical assistance, peer reviews and mutual learning).

All this monitoring and assessment process requires adequate data and information. This includes the establishment of a set of indicators to monitor the implementation of the Innovation Union (Innovation Union Scoreboard[14]). It is also in this context that the above referred Industrial Research and Innovation project (which includes the EU Industrial R&D Scoreboard[15]) is implemented and the CONCORDi conferences are organised.

The following section concludes with some of the main research and policy questions to be addressed in CONCORDi 2015 Conference.

[14] European Commission (2015b)

[15] European Commission (2014e)

IV. Open research and policy questions for CONCORDi 2015

Drawing on the invited and selected papers for the Conference (see in the Annex the text-based highlights of the selected papers), the posters to be presented and the discussions they will set in motion, CONCORDi-2015 aims to address a number of open research and policy issues. Some of the questions are proposed in the following paragraphs.

IV.1 Research issues

- Which are the shortcomings of current theoretical and analytical frames in providing evidence for industrial research and innovation policy?
- To which extent evidence can inform about the territorial level or levels at which policies can usefully be designed and implemented?
- What is the present and future of industrial dynamics and how research and innovation can better boost EU corporate competitiveness and growth?
- Which indicators could be more adequate to measure corporate innovation inputs, processes and outcomes?
- Which data and level(s) of data disaggregation are the most appropriate in addressing the different of levels of policy making?
- To which extent and how the hierarchy of evidence and/or methodologies (e.g. randomized control trials, cross-industry studies, case studies, surveys, etc.) shall be accounted for in the innovation policy design and implementation?
- How to properly assess the multiple additionality effects of public innovation policies on corporate R&D and innovation activities?
- To which extent the evidence on additionality effects of public policies can inform on the effectiveness of innovation policy instruments?
- What type of evidence and evaluations would be needed to inform policy making on the contextual circumstances for failures and successes of the public support to industrial innovation?

IV.2 Policy questions

- What are the current and upcoming challenges of EU policy making in the area of corporate R&D and innovation?
- Which kinds of evidence would be expected to best contribute to the design and implementation of industrial research and innovation policies?
- How to reinforce the use of scientific evidence in the EU corporate innovation policy making?
- Is there a room for policy testing and experimentation before introducing measures tailored to corporate R&D and innovation at larger scale?
- To which extent innovation policy concepts and frames are evidence-based and provide relevant policy prescriptions to foster innovation?
- How evaluation studies can be used to inform on or limit government failures in innovation policy making and implementation?
- How to design appropriate regional, national and European research and innovation policies for knowledge-intensive firms that aim at increasing their international scope?
- How to improve the coordination of evidence-based policy frames and practices between Member States systems?

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Annex I
Texts-based highlights of the invited and accepted papers/abstracts

KEYNOTE PRESENTATIONS

[Day 1 – Opening Plenary] Evidence-based policy: The holy grail? Or a snare and a delusion?

by Martin, B. R.

"*The paper examines the driving-forces behind the rise of evidence-based policy and other related developments. It analyses what evidence-based policy requires in order to be put into operation, and the conditions under which evidence is most likely to influence policy. A number of examples of where researchers in the field of science policy and innovation studies have had a major impact on policy are considered, along with the factors that appear to have contributed to the successful impact."*

[Day 2 – Closing Plenary] Europe's twin deficits: excellence and innovation in new sectors

by Sachwald, F.

"*This paper argues that the diagnosis on the European innovation performance should be thoroughly re-examined: the EU suffers from twin deficits, in research excellence and in innovation in new sectors. The EU is insufficiently R&D intensive to a large extent because its structure is not that of a knowledge-based economy. And this is not only about manufacturing, but also about the digital economy and knowledge intensive services. (…).The identification of the EU's innovation twin deficits calls for a renewed reflection on the mix of public policies to stimulate research and innovation. These policies would benefit from more precise and detailed evidence on the interactions between research and innovation across scientific disciplines, technological areas and industrial sectors."*

SESSION I. Theory, measurement and evidence on corporate R&D and innovation dynamics

[1.1] ***Knowledge appropriability and economic policy,***

by Antonelli, C.

"*The aim of the paper is to explore the full range of consequences of the limited appropriability of knowledge. It calls attention on the interplay between its negative effects in terms of missing incentives to its generation and on its positive effects on the levels of pecuniary knowledge externalities, the recombinant generation of knowledge, the consequent secular decline of its cost and hence on the augmented supply of new technological knowledge.(…) Along these metaphoric lines, the quality of the institutional set of an economic system from the viewpoint of the most effective use of technological knowledge seems to consist in the architectural design of the distribution of mirrors that is able to maximize the amount of light produced by each candle."*

[1.2] ***Evolution of EU corporate R&D: intensity gap, sector dynamics and firms demographics,***

by Moncada-Paternò-Castello, P.

"*This study provides new insides on the evolution of corporate R&D, by searching one of the foundations which originated for the EU 3% R&D investment policy target. The investigation contributes to the existing literature on the subject (…), by (a) verifying whether the EU corporate R&D investment gap vis-à-vis competing economies is due to an "intrinsic" or to a "structural" effect (…) and allowing to analyse how the EU corporate R&D intensity gap has changed in the last decade (…). Furthermore, (b) the analysis investigates the distribution of R&D by sectors and firms, and (c) the link between R&D sectoral dynamics and the demographics of top R&D investing firms*".

[1.3] ***The new EU 2020 innovation indicator: A step forward in measuring innovation output?,***

by Andries, P., Hoskens, M., Janger, J., Rammer, C. and Schubert, T.

"*The aim of this paper is to evaluate this new innovation output indicator, based on advancing our conceptual understanding of notoriously difficult innovation output measurement. (…). In a nutshell, in the following we argue that measuring innovation output and outcome in a comprehensive way based on indicators requires a balanced approach. First, one should consider both radical and incremental innovations since both contribute to economic benefits. Second, one should combine a micro and a meso perspective, i.e. consider changes in the behaviour of economic actors within existing industries towards higher innovation content of output (which we will label "structural upgrading"), as well as structural change towards more innovation- or knowledge intensive industries (which we will label "structural change") "*

[1.4] ***Innovation and employment in patenting firms: empirical evidence from Europe,***

by Van Roy, V., Vertesy, D. and Vivarelli, M.

"This paper differs from prior work from different perspectives. Firstly, we measure the impact of innovation from a "quality" perspective; for this purpose, we rely on forward-citation weighted patent counts that reflect the technological importance of patents for the development of subsequent technologies (…). Secondly, we contribute to the existing literature by analyzing the effects of innovation on labor demand using a large EU wide panel dataset, while most of previous studies rely on single country databases. Thirdly, we present evidence for separately manufacturing and services and for high-tech versus low-tech manufacturing sectors and so we are able to disentangle the emergence (or the absence) of job-creating effects across the different economic sectors."

[1.5] ***Innovation and standardization as drivers of companies' success in public procurement – An empirical analysis,***

by Blind, K. and Rainville, A.

"*No research has looked both at the innovativeness of companies and their involvement in standardization as a potential success factor in the receipt of contracts. (…). Simultaneously analyzing companies' engagement in standardization at standards developing organizations (SDOs), which create many standards that are also relevant to public procurement and companies' innovation activities is required to provide additional insights into how to optimize the interaction between innovation, standardization and public procurement in order to push their impacts on growth. This paper provides a first attempt to do so*."

SESSION II. Entrepreneurship, firms' performance and territorial innovation policies

[2.1] ***Scientist entrepreneurship and the strategic management of places?,***

by Audretsch, D.B.

"*The ability of a region to absorb university-based knowledge also contributes to the effectiveness of university spillovers. Such absorptive capacity mechanisms exist outside of the university and include the existence of complementary research oriented large and small firms, non-profit organizations with a mandate to generate links between the regional economy and the university, and a rich set of entrepreneurial networks constituting the basis for vibrant entrepreneurship capital.(…) By creating linkages, interactions and networks across all of these boundaries, policy can make a vital contribution to facilitating the spillover of knowledge that generates growth and employment."*

[2.2] ***Data as basis for assumptions underlying policy measures with respect to high growth entrepreneurship,***

by Brännback, M.

"*Entrepreneurship and innovation have been shown to be two important sources of national wealth creation. In fact there are those who will argue at great length that without innovation there is no entrepreneurship and without entrepreneurship there is no innovation.(…) Another widely held assumption is that wealth creation is the reason for creating a venture and becoming an entrepreneur.(…) A third assumption with respect to entrepreneurship is related to job creation.(…) Why are assumptions and reality worlds apart? In this paper I will show that the data underlying some of our key assumptions are not coherent because we confuse absolute and relative measures, we use data from different levels of analysis and we fail to accommodate for individual entrepreneurial desires in considering national interests."*

[2.3] ***Patent boxes design, patents location and local R&D,***

by Alstadsæter, A., Barrios, S., Nicodeme, G., Skonieczna, A. and Vezzani, A.

"*In this paper, we provide novel empirical evidence on the determinants of the geographical distribution of patent applications made by the 2,000 top corporate R&D investors. (…) Our sample covers 33 countries (the EU28, the USA, Canada, Switzerland, the Republic of Korea and China) and three sectors of activity (the pharmaceutical industry, the car industry and the Information and Communications Technology, ICT), (…). We disentangle the general effects of the corporate income tax (CIT) rate from tax and non-tax characteristics of patent boxes such as their scope and eligibility conditions, and investigate whether or not these characteristics influence local research activity. (…) To the best of our knowledge, this is the first attempt to analyse the various specific designs of patent boxes and to test their impacts on patent location and local inventorship."*

[2.4] ***Innovation strategies and firm growth: New longitudinal evidence from Spanish firms,***

by Bianchini, S., Pellegrino, G. and Tamagni, F.

"*Innovation is the search for, and the discovery, development, improvement, adoption and commercialization of, new processes, new products and new organizational structures and procedures. It involves indeed uncertainty, risk taking, probing and re-probing, experimenting and testing. Thus the process of innovation itself, and its ensuing effects on various aspects of firm performance, can be extremely heterogeneous and difficult to predict. (…) This paper, by taking advantage of a rich panel on innovation activity of Spanish manufacturing firms, provides new evidence on the relationships between success on the market, in terms of sales growth, and a richer set of innovation dimensions, capturing innovation inputs and outputs as well as different modes of sourcing new knowledge."*

[2.5] ***Current status and future prospects of evidence-based research and innovation policy: the case of Smart Specialisation,***

by Dosso, M. and Hardeman, S.

"*Despite a call for evidence-based research & innovation policy (EBR&IP) becoming ever more vocal, its meaning and prospects remain more often than not in the midst. Going from its main antecedents, evidence-based medicine and evidence-based policy at large, this paper first seeks to clarify the potential for and challenges of EBR&IP. Particularly from an evidence-based perspective, it addresses the conceptual challenges and the shortcomings in the operationalization the Smart Specialization Strategies (S3) concept. (…), the paper supports the development of an evidence-based heuristics for the S3 policy approach, (…); this is even more relevant as the S3 approach claims to be evidence-driven."*

SESSION III. Impact of public policies and their additionality in supporting corporate R&D and innovation

[3.1] ***Research evaluation: who and how is learning from it?***

by Borrás, S.

"*In spite the large literature on research evaluation, little is still known about the use that policy makers do of the evaluations, and the learning processes associated to that. This presentation digs into this gap in the literature, elaborates an analytical framework based on the learners' perspective, and studies some relevant cases of policy learning from research evaluation exercises, showing the modalities of learning and the prospects in that."*

[3.2] ***Public innovation policy and firm innovation strategies: public risk capital funding should be seed funding – but additionality is not there! ,***

by Edquist, C.

"*The paper will address that kind of public financing, i.e. policy that is directly related to the adoption and transformation of knowledge into new products (and processes) by firms through commercialization. (…) We will use considerable effort to discuss where (in which situations) private funding is not available and why this is so. The reason is that such unavailability means that public involvement is justified, i.e. additionality is at hand. (…)If private capital is available, there is, of course, no need for public risk capital funding. (…)This means that private initiatives shall not be duplicated or crowded out. The additionality criteria will be developed in detail in the paper. "*

[3.3] ***R&D subsidies and firms' cost of debt,***

by Demeulemeester, S. and Hottenrott, H.

"*The major aim of this study is therefore to investigate how a firms' cost of debt is affected by the receipt of an R&D grant. (…)This paper contributes to the existing literature on the certification effect of R&D grants in two ways. First, while most studies examine whether the receipt of R&D subsidies increases a firm's ability to raise debt levels, no study has investigated the impact on the cost of debt capital. Second, scholars generally attribute the effect to quality signaling, albeit only few attempts have been made to identify multiple effects of obtaining the public support on external financing."*

[3.4] ***Additionality effects of public support programmes on cooperation for innovation: evidence from European manufacturing SMEs***

by Radicic, D., Pugh, G. and Douglas, D.

"*We draw on a unique dataset of SMEs mainly in six manufacturing industries across seven EU regions, and employ several matching estimators to investigate the impact of public support measures on cooperation for innovation. (…) In general, public intervention can result in additionality (or complementarity) of public funding and firms' private innovation activities, or it might produce a crowding-out effect, whereby public funding substitutes firms' own privately funded activities (…).This study departs from existing empirical literature by focusing on the behavioural additionality in SMEs as well as by conducting sensitivity analysis to indirectly test one of the main assumptions underlying matching estimators*."

[3.5] ***Mix and match: evaluating the additionality of the R&D policy mix,***

by Neicu, D.

"*In a bid to build on these two streams of literature, my paper addresses behavioural additionality induced in Belgian firms by subsidies and tax credits for R&D from a systemic perspective, comparing different mixes to draw a more comprehensive picture. Specifically, I test whether using both measures – direct R&D grants and a partial exemption on researchers' wage withholding tax – changes the way in which firms manage R&D projects in terms of increasing or shifting funds between applied and fundamental research or development activities. Moreover, I use a rich dataset to compare the two policies with each other in order to reveal whether heterogeneous support translates into heterogeneous effects on the R&D behaviour of companies.*"

Annex II
Programme of CONCORDi-2015

5TH EUROPEAN CONFERENCE ON CORPORATE R&D AND INNOVATION: CONCORDI 2015

INDUSTRIAL RESEARCH AND INNOVATION: EVIDENCE FOR POLICY

Organised by the Joint Research Centre's
Institute for Prospective Technological Studies of the European Commission

Seville, 1-2 October 2015

Conference Venue: Escuela de Organización Industrial (EOI)
Calle Leonardo da Vinci, 41092 Isla de la Cartuja, Seville (Spain)

PROGRAMME

Thursday, 1 October 2015

OPENING

8h00 – 8h50 Registration

8h50 – 9h00 Opening: John Bensted-Smith (Director, European Commission JRC- IPTS, ES)

9h00 – 9h15 Welcome speech: José Domínguez Abascal (Chief Technology Officer, ABENGOA, ES)

9h15 – 9h45 Keynote speech: ***Evidence-based policy***, Ben Martin (Professor of Science and Technology Policy, Sussex University, UK)

9h45 – 10h00 Open discussion

10h00-10h30 Coffee break and Poster session

10h30 – 12h30 PLENARY SESSION I

Theory, measurement and evidence on corporate R&D and innovation dynamics

Chair: Reinhilde Veugelers (Katholieke Universiteit Leuven, BE)

➔ *Knowledge appropriability and economic policy* by Cristiano Antonelli (University of Torino, IT)

➔ *Evolution of EU corporate R&D: intensity gap, sector dynamics and firms demographics* by Pietro Moncada-Paternò-Castello (European Commission, ES)

➔ *The new EU 2020 innovation indicator: a step forward in measuring innovation output?* by Petra Andries (University Ghent, BE) Machteld Hoskens (Katholieke Universiteit Leuven, BE), Jürgen Janger (Austrian Institute for Economic Research, AT), Christian Rammer (Centre for European Economic Research, DE), Torben Schubert (University of Lund, SE)

➔ *Innovation and employment in patenting firms: empirical evidence from Europe* by Vincent Van Roy (European Commission, IT), Daniel Vertesy (European Commission, IT) and Marco Vivarelli (Università Cattolica del Sacro Cuore, IT)

➔ *Innovation and standardization as drivers of companies' success in public procurement – An empirical analysis* by Knut Blind (Technische Universität Berlin, DE) and Anne Rainville.

12h30-13h30 Lunch and Poster session

13h30 – 15h30 PLENARY SESSION II

Entrepreneurship, firms' performance and territorial innovation policies

Chair: Mariagrazia Squicciarini (Organisation for Economic Co-operation and Development, FR)

➔ *Scientist entrepreneurship and the strategic management of places?* by David B. Audretsch (Indiana University, USA)

➔ *Data as basis for assumptions underlying policy measures with respect to high growth entrepreneurship* by Malin Brännback (Åbo Akademi University, FI)

➔ *Patent boxes design, patents location and local R&D* by Annette Alstadsæter (University of Oslo, NO), Salvador Barrios (European Commission, ES), Gaetan Nicodeme (European Commission, BE), Agnieszka Skonieczna (European Commission, BE) and Antonio Vezzani (European Commission, ES)

➔ *Innovation strategies and firm growth: new longitudinal evidence from Spanish firms* by Stefano Bianchini (University of Strasbourg, FR), Gabriele Pellegrino (WIPO and EPFL, CH) and Federico Tamagni (Scuola Superiore Sant'Anna, IT)

➔ *Current status and future prospects of evidence-based research and innovation policy: the case of Smart Specialisation* by Mafini Dosso (European Commission, ES) and Sjoerd Hardeman (CPB Netherlands Bureau for Economic Policy Analysis, NL).

15h30-16h00 Coffee break and Poster Session

16h00 – 18h00 PLENARY SESSION III

Impacts of public policies and their additionality in supporting corporate R&D and innovation

Chair: Bronwyn Hall (University of California, Berkeley, USA; and University of Maastricht, NL)

- ➔ *Research evaluation: who and how is learning from it?* by Susana Borrás (Copenhagen Business School, DK)
- ➔ *Public innovation policy and firm innovation strategies: public risk capital funding should be seed funding – but additionally is not there!* by Charles Edquist (Lund University, SE)
- ➔ *R&D subsidies and firms' cost of debt* by Sarah Demeulemeester and Hanna Hottenrott (Katholieke Universiteit Leuven, BE)
- ➔ *Additionality effects of public support programmes on cooperation for innovation: evidence from European manufacturing SMEs* by Dragana Radicic (Bournemouth University School of Management, UK), Geoffrey Pugh (Staffordshire University Business School, UK) and David Douglas (Leeds Beckett University Business School, UK)
- ➔ *Mix and match: evaluating the additionality of the R&D policy mix* by Daniel Neicu (Katholieke Universiteit Leuven, BE).

18h00 End of the first day

20h30 COCKTAIL DINNER AND BEST PAPER AWARD CEREMONY

Venue: Casa Palacio Condesa de Lebrija – Address: Calle Cuna, No. 8; 41003 Seville, Spain

Friday, 2 October 2015

CLOSING

8h30-8h45 Welcome

Francisco J. Velasco Cabello (Director, Escuela de Organización Industrial Andalucía, ES)

8h45-8h50 Opening of the second day

John Bensted-Smith (Director, European Commission JRC- IPTS, ES)

8h50-9h20 Keynote speech: ***Europe's twin deficits: Excellence and Innovation in new sectors***

Frédérique Sachwald (Deputy head of the Transfer and Innovation Division, Ministry of Education, Higher Education and Research, FR): *Europe's twin deficits: excellence and innovation in new sectors*

9h20 -10h15 Summary of the scientific output of the Conference

Cristiano Antonelli (University of Torino, IT)

David B. Audretsch (Indiana University, USA)

Susana Borrás (Copenhagen Business School, DK)

10h15 – 11h00 Scientific round table discussion

Chair: **Pietro Moncada-Paternò-Castello** (European Commission, ES)

Panellists:

Chairs of Plenary Sessions I-III and Members of the Scientific Committee

11h00-11h30 Coffee break

11h30-13h00 Statements and round table discussion by Policy Stakeholders

Chair: **Alessandro Rainoldi** (European Commission – JRC, Unit J.2: Knowledge for Growth)

Panellists:

Richard Deiss (European Commission – Directorate-General for Research and Innovation, Unit A.4: Analysis and monitoring of national research policies)

Markus Berndt (European Investment Bank – Economics Directorate, Policy and Strategy Division)

Isabel Grilo (European Commission – Directorate-General for Economic and Financial Affairs, Unit B.2: Product Market Reforms)

Kamil Kiljanski (European Commission – Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, Unit 01: Economic Analysis)

Nicola Pesaresi (European Commission – Directorate-General for Competition, Unit A.3: State Aid Strategy)

Agnieszka Skonieczna (European Commission – Directorate-General for Taxation and Customs, Unit D4: Economic analysis, Evaluation and Impact assessment support)

Colin Wolfe (European Commission – Directorate-General for Regional and Urban Policy, Unit DGA2.G1: Competence Centre for Smart and Sustainable growth)

13h00-13h30 Concluding remarks

Annette Borchsenius (Ministry for Science and Innovation and Higher Education – DK, and Member of the JRC Board of Governors)

John Bensted-Smith (Director, European Commission JRC- IPTS, ES)

13h30 End of the conference

POSTERS

Author(s)	Affiliation(s)	Poster title
Alex Coad, Mercedes Teruel and Agustí Segarra	Science and Technology Policy Research Unit (SPRU), Brighton, UK	Innovation and firm growth: Does firm age play a role?
Hugo Pinto and Tiago Santos Pereira	Centre for Social Studies University of Coimbra & Faculty of Economics, University of Algarve, PT	Resilience, persistence and innovation under the economic turmoil: Insights from the Portuguese CIS Data
Michele Cincera, Virginie Maghe and Anabela Santos	iCite – Solvay Brussels School of Economics and Management Université Libre de Bruxelles, BE	Impact of environmental factors on public R&D spending efficiency: Stochastic Frontier Analysis
Dina Pereira and João Leitão	Universidade da Beira Interior Faculdade de Ciências Sociais e Humanas Departamento de Gestão e Economia, PT	Absorptive capacity and firms' generation of innovation: Revisiting Zahra and George's Model
Antoine Schoen, Patricia Laurens, Lionel Villard	Université Paris-Est, Lisis, Ifris, FR	The value of internationalisation of industrial R&D
Maria Elena Bontempi, Luca Lambertini, Erica Medeossi	Department of Economics, University of Bologna, IT	Market power and duration of R&D investment
Petra Turkama	Center for Knowledge and Innovation Research (CKIR), Aalto University School of Business, FI	Discussion on the renewed dynamics of policy, science and industry in digitalization
Néstor Duch-Brown and Ibrahim Kholilul Rohman	European Commission JRC-IPTS, ES	Determinants of R&D, barriers to innovation and productivity in the ICT-producing sector: Evidence from Spain

Annex III
Members of the Scientific and Steering Committees

Scientific Committee

Cristiano Antonelli (University of Torino, IT)
David B. Audretsch (Indiana University, USA)
Susana Borrás (Copenhagen Business School, DK)
Malin Brännback (Åbo Akademi University, FI)
Charles Edquist (Lund University, SE)
Ben Martin (University of Sussex, UK)
Pietro Moncada-Paternò-Castello (European Commission, ES)
Frédérique Sachwald (Ministry of Education, Higher Education and Research, FR)
(Bios in the Annex)

Steering Committee (European Commission, Joint Research Centre)

Mafini Dosso
Petros Gkotsis
Fernando Hervás
Pietro Moncada-Paternò-Castello (*Coordinator*)
Alessandro Rainoldi
Rosy Rueda

Contact

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Information on previous editions of CONCORDi can be found here:
http://iri.jrc.ec.europa.eu/concord.html

Annex IV
BIOs of the Scientific Committee Members

CRISTIANO ANTONELLI

Cristiano Antonelli holds the chair of Political Economy of the University of Torino. He is editor of the Economics of Innovation and New Technology journal, President of the International Center for Economic Research (ICER) and the Director of BRICK (Bureau of Research on Innovation, Complexity and Knowledge) of the Collegio Carlo Alberto. He is an Advisor to the Ufficio Studi of the Banca d'Italia. He is a member of the Board of Trustees of the Fondazione CRT. He has been the Director of the Department of Economics Cognetti de Martiis. He has been a Rockefeller Fellow at the MIT (1982-1985) and a junior economist at the OECD (1978-1980). He has been a member of the Board of Telecom Italia (1998 and 1999), and of the Scientific Board of ENEA (from 1999 to 2003). He has held appointments at the Victoria University of Manchester, the University of Paris-Dauphine, the University of Nice, the Federal University of Rio de Janeiro and the University of Aix-en-Provence. He has been vice-president of the International Schumpeter Society in the years 2000-2004. The main results of his recent research are now available in 'Localized technological change. Towards the economics of complexity' (London, Routledge, 2008) as well in his previous books 'The Microeconomics of Technological Systems' (Oxford University Press, Oxford, 2001), 'The Economics of Innovation, New Technologies and Structural Change' (Routledge, London, 2003) and 'The Path Dependent Complexity of Localized Technological Change: Ingredients, Governance and Processes' (Routledge, London, 2007 forthcoming).

DAVID AUDRETSCH

David Audretsch is Professor and Ameritech Chair of Economic Development at Indiana University, where he also serves as Director of the Institute for Development Strategies. He also is an Honorary Professor of Industrial Economics and Entrepreneurship. He is member of the Advisory Board to a number of international research and policy institutes, including the Deutsches Institut fuer Wirtschaftsforschung (German Institute for Economic Analysis). He is presently Editor of the following Journals: Small Business Economics: An Entrepreneurship Journal; Foundations and Trends in Entrepreneurship (with Zoltan Acs); International Entrepreneurship and Management Journal; International Journal of Entrepreneurship Education.

SUSANA BORRÁS

Susana Borrás is Professor of innovation and governance at Copenhagen Business School, Denmark. She is currently serving as the Head of the Department of Business and Politics at the same university. She conducts research on the interaction between governments and innovation. As a social scientist expert on public policy, two of her leading questions are, what governments can do to foster and to improve socio-technical innovation in the economy, and what makes some decisions regarding socio-technical and innovation change to be democratically legitimate and others not. Her comparative analyses show the importance that socially and

governmentally-defined institutions have on innovation performance and on democratic legitimacy of science and technology. Her main attention is in the European Union, both at the supra-national level as well as national and local (cluster) levels. In particular she studies the complex interactions between public and private realms, which have been recently called 'new modes of governance'.

MALIN BRÄNNBACK

Malin Brännback is currently Dean of Faculty of Social Sciences and Economics at Åbo Akademi University (2015-2018) and Chaired Professor (international business) at Åbo Akademi University. Moreover, she does many additional activities as for example the supervision of an average of 7 under graduate theses per year, board member, ad hoc reviewer of manuscripts, chair and scientific committee member, among others. She has reached 196 publications up to now and she speaks five languages: Swedish, Finnish, English, French and German.

CHARLES EDQUIST

Charles Edquist is the holder of the Ruben Rausing Chair in Innovation Research at CIRCLE, Lund University, Sweden, since February 2003 and has previously held a Chair at the University of Linköping. His publications include books and articles on innovation processes, innovation systems and innovation policy. Of these, the edited volumes "Systems of Innovation: Technologies, Institutions and Organizations" (1997) and "Small Country Innovation Systems: Globalization, Change and Policy in Asia and Europe" (2008; in 2012 also in Chinese) constitute contributions to the development of the so-called Systems of Innovation (SI) Approach. So does the chapter "Systems of Innovation: Perspectives and Challenges" (2005), in the Oxford Handbook of Innovation. He has made many contributions to the field of innovation policy and governance of innovation systems, the latest being articles in Research Policy (2012) and Industrial and Corporate Change (2011). The fact that he is among the 50 (or so) most cited innovation researchers (out of 6 – 7 000) in the world is testimony to the impact of his research. His most cited book is on public procurement for innovation. He was given the award for best paper for "Competence Building: A Systemic Approach to Innovation Policy" at the Atlanta Conference of Science & Innovation Policy, Georgia, USA, 26-28 September 2013.

BEN MARTIN

Ben Martin, SPRU Chief editor of Research Policy, Professor of Science and Technology Policy Studies BA (first class honours) degree in Natural Sciences, University of Cambridge, and Kitchener Scholar (Churchill College, Cambridge); MSc ('The Structure and Organisation of Science and Technology'), University of Manchester. Professor Ben Martin studied physics as an undergraduate at Cambridge and science policy as a postgraduate at Manchester. He has carried out research for 30 years in the field of science policy, serving as the Principal Investigator or Project Leader on over 50 research projects and commissioned studies. These have been mostly concerned with the development of techniques for generating systematic information to aid decision-making in relation to science, engineering and technology.

PIETRO MONCADA-PATERNÒ-CASTELLO

Pietro Moncada-Paternò-Castello is Senior Analyst at the European Commission JRC-IPTS. He is Facilitator of the Cluster of sixteen JRC projects on "Innovation, Knowledge Transfer, Competitiveness and Employment". Before joining IPTS in 1995 he worked, as Founder and President, in the Agency for Natural Resources Energy and Technology (ANETEC, BE), in the MIT Energy Laboratory, Electric Utility Program (USA) and in the EC's Directorate General for Research and Technological Development (BE). Former responsibilities within the IPTS include, e.g.: Acting Head of Unit, "Knowledge for Growth"; Action Leader, "Economics of Industrial Research and Innovation"; Manager, "European Science and Technology Observatory". His scientific experience includes being author of scientific papers, member of scientific panels, member of editorial boards of scientific journals, speaker at conferences and lecturer at university courses. His research interests include economics of corporate R&D and innovation, firm dynamics, employment and competitiveness; management of technological change, and research & innovation policy.

FRÉDÉRIQUE SACHWALD

Frédérique Sachwald is Deputy Head of the Transfer and Innovation Division at the French Ministry of Education, Higher education and Research. This division is in charge of various schemes to develop technology transfer and manages the French R&D tax credit scheme. Frédérique Sachwald is more specifically in charge of designing indicators and evaluation for the French research and innovation policy, which involves interministerial coordination. She is the French delegate to OECD Committee for Science and Technology Policy (CSTP). At the EU level, she is a member of the RISE (Research, Innovation and Science policy Expert) high level group of DG Research and Innovation. Formerly, Frédérique Sachwald has been Head of Economic studies at IFRI (French Institute for International Relations) a think tank based in Paris. She has published extensively in the fields of international economics and innovation studies. She has in particular studied the development of global production and innovation networks and their impact on trade, knowledge flows and local economies. She holds a PhD. in Economics from Ecole des Hautes Etudes en Sciences Sociales (Paris) and degrees from the Institut d'Etudes Politiques in Paris and Cambridge University (UK).

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