European Commission

Quarterly R&I literature review 2022/Q4

The impact of R&I policy instruments

R&I PAPER SERIES
LITERATURE REVIEW

Research and Innovation

The impact of R&I policy instruments

European Commission
Directorate-General for Research and Innovation
Directorate G — Common Policy Centre
Unit G.1 — Common R&I Strategy & Foresight Service

Contact Alexandr Hobza, Head of Unit G1, Chief Economist
Alessio Mitra, review coordinator, Unit G1

Email Alexandr Hobza@ec.europa.eu
Alessio.MITRA1@ec.europa.eu
RTD-ECONOMIC-ANALYSIS@ec.europa.eu

European Commission
B-1049 Brussels

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Literature review

2023 Directorate-General for Research and Innovation EN

TABLE OF CONTENTS

INTRODUCTION

This literature review is developed by the 'Economics of R&I' team of the Chief Economist unit of DG Research and Innovation. It provides a brief summary of a selection of recent publications on R&I economics and policy. Contributors for this edition: Valentina Di Girolamo, Alessio Mitra, Océane Peiffer-Smadja, Julien Ravet (team leader), Jan-Tjibbe Steeman.

The primary argument for public support of innovation is that of market failure. For example, due to the large positive externalities associated with R&D, the social return of innovation is often larger than the private one, leading private firms to under-invest in R&D. The extra profits of firms investing in R&D do not fully reflect the social benefits of the R&D. This is because other firms can benefit from spillovers from these investments as they copy the innovation and/or build on the knowledge created by the inventor's R&D. Moreover, domestic and foreign consumers will get the innovation benefits at a tiny fraction of the (full) costs.

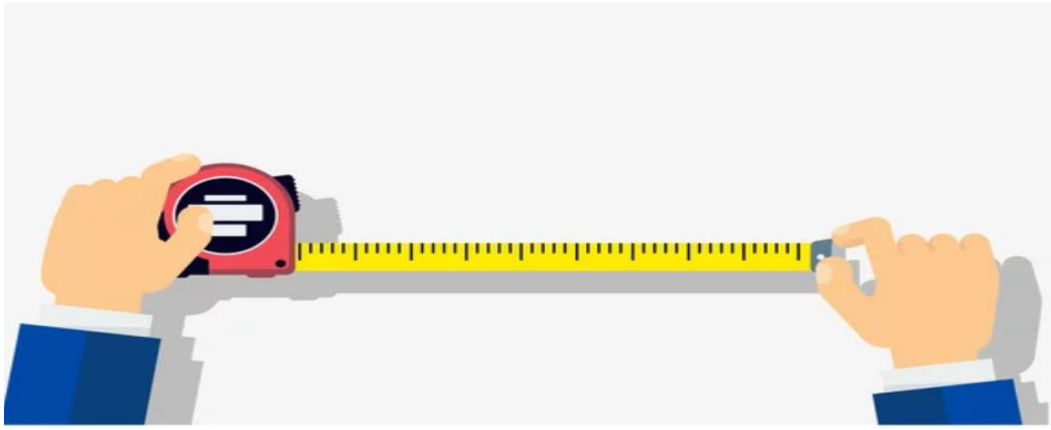
At the same time, network failures and coordination failures may arise in the innovation ecosystem preventing innovation from diffusing freely in the economy and limiting the social gains of innovation.

A vibrant innovative economy is part of what we need to tackle the climate crisis and succeed with the transition to net-zero. Almost half of the reductions in CO2 needed to reach the 2050 targets need to come from technologies that are not yet available.

The European Union deploys a wide set of research and innovation policies in order to promote private sector engagement in R&I activities, support cross-border and public-private research cooperation, and encourage human capital development.

A fundamental part of policymaking is to evaluate the impact of the deployed policies to understand what has worked and what has not, learn and improve based on the lessons learned.

This literature review looks into recent papers that evaluated the impact of a wide set of EU innovation policy tools of the Seventh Framework Programme (FP7) and the Eight Framework Programme (Horizon 2020).

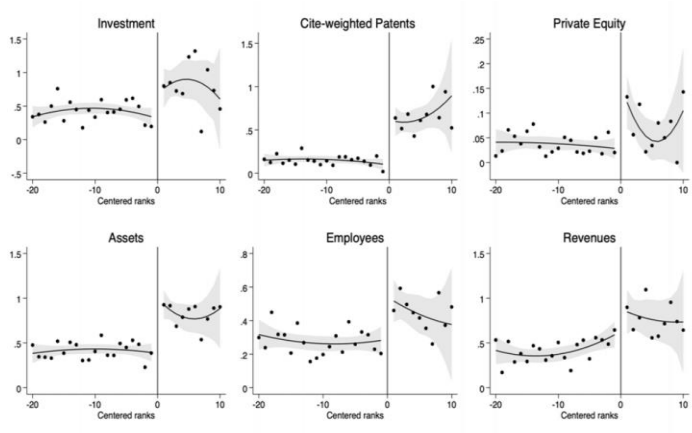


EU R&D GRANTS AND FIRMS' INNOVATION

Pietro Santoleri, Andrea Mina, Alberto Di Minin, Irene Martelli; The Causal Effects of R&D Grants: Evidence from a Regression Discontinuity. The Review of Economics and Statistics 2022; doi: https://doi.org/10.1162/rest_a_01233

Messages	**1. EU research & development (R&D) grants, awarded to small and medium-sized businesses (SMEs) through the SME instrument of Horizon 2020, are effective. They trigger an increase in subsequent firm investment, especially in intangibles, in innovation output as measured by citation-weighted patents, and equity investments. 2. The impact of EU R&D grants is larger for younger and smaller businesses, for firms that operate in sectors with higher financial vulnerability, and that are located in countries and regions with lower economic development.**

The paper estimates the causal impact of EU R&D grants, awarded through the SME instrument of Horizon 2020, on a wide set of firm-level innovation outcome variables. The SME Instrument was established in 2014 and was rolled out by the Executive Agency for Small and Medium-sized Enterprises (EASME). The objective was to support SMEs innovation with a budget of around 3 billion euros over 2014-2020.



The authors employ confidential data on applicants to the programme, as well as their fiscal and patenting information. To identify the causal effect of R&D subsidies on firms' innovation performances, the authors exploit the policy assignment mechanism of the SME instrument and adopt a sharp regression discontinuity design (RDD). The empirical methodology employed in the paper compares firms just below and above the funding eligibility threshold. Such firms are very similar, and potential differences in the post-treatment performance of beneficiaries and non-beneficiaries can be attributed to the grant.

Grants are found to increase subsequent firms investments (particularly in intangibles), patenting activity, the probability of receiving external equity, assets growth, employment growth, revenues, and a decrease in the likelihood of failure.

The paper also finds large heterogeneous effects across firms' size, age, sector and region. The impact of the policy instrument is found to be much larger in smaller and younger firms. Furthermore, firms in relatively poorer regions are found to enjoy larger effects from the programme.

Given these results, the authors conclude that EU R&D grants targeted at single firms (like those of the SME instrument) are highly effective in addressing private under-investment in R&D.

EU R&D GRANTS AND FIRMS' PRODUCTIVITY

Tucci, G. K. P. M. F. (2020). The Impact of EU Grants for Research and Innovation on Private Firms' Performance. knowledge4policy.ec.europa.eu

Messages	**1. Public grants and subsidies have the potential to support private innovation activities by reducing the costs of the innovation and, thereby, stimulate R&D investments. 2. The grants issued through the EU's 7th Framework Programme for R&I are found to have a positive impact on firms' labour productivity.**

The paper investigates the impact of EU grants supporting research and innovation on firms' productivity. In doing so, the paper exploits a unique dataset built by merging different data sources: 1. CORDA, the European Commission's database providing information on both successful and unsuccessful applicants to the EU's 7th Framework Programme for R&I (FP7); and 2. ORBIS, including information on private firms' balance-sheets. The final dataset contains information on firms across 46 countries.

To assess how EU grants issued through FP7 impact the labour productivity of winning firms, the authors rely on Regression Discontinuity Design (RDD) technique. Given the characteristics of the programme's awarding process, the analysis is carried out by using a fuzzy RDD, combined with a local average treatment effect (LATE) estimation in a two-stage procedure. Eligibility for the grant depends on the score assigned to each project by the expert committee involved in the projects' evaluation procedure. Specifically, the external experts' scores allocated to each project proposal are used to compare average post-treatment labour productivity of "marginal beneficiaries" (granted firms with an application score slightly above the threshold) and "marginal non-beneficiaries" (unsuccessful firms with a score slightly below the threshold).

The results from the first-stage regression suggest that having a research organisation, higher education or research institution, associate or new member country in the consortium slightly increased the probability of being selected. On the contrary, having a public institution or candidate country is found to slightly decrease the chances to win. However, all the estimated coefficients are small in magnitude.

In the second-stage regression, the authors find clear evidence that receiving co-funding raises post-treatment labour productivity.

Table 3: Fuzzy RDD estimate of the effect of FP7 research grants on profit-oriented firms' post-treatment labour productivity

	First-stage regression (1)	Second-stage regression (2)
LATE		0.19***
		(0.05)
above thold (score>0)	1.15***	
	(0.03)	
pre-treatment lab. prod.	0.01***	0.67***
	(0.00)	(0.02)
presence of research inst.	0.04***	0.06***
	(0.01)	(0.02)
presence of higher edu.	0.04***	0.03
	(0.01)	(0.02)
presence of public inst.	-0.03***	-0.04**
	(0.01)	(0.02)
presence of associate country	0.04***	-0.03*
	(0.01)	(0.01)
presence of candidate country	-0.04***	0.00
	(0.01)	(0.02)
presence of tiers country	0.01	0.01
	(0.01)	(0.02)
presence of new member state	0.01**	0.01
	(0.00)	(0.01)
nobs.		18 372
eff. nobs. below thold		7 721
eff. nobs. above thold		6 689
order est.		3

ERC AND RESEARCHERS' PRODUCTIVITY

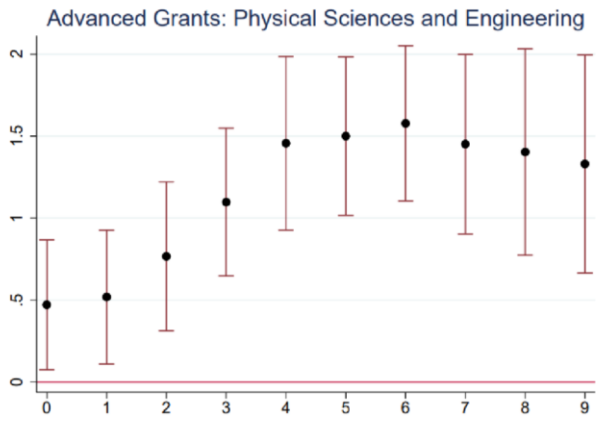
Ghirelli C., Havari E., Meroni E., Verzillo S. (2022). The Impact of European Research Council Grants on Scientific Productivity and Research Network. JRC132586.

Messages	**Obtaining an ERC grant does not homogenously improve researchers' productivity (number of publications), excellence (h-index, publications in top 1 % ranked journals) or the research network (number of distinct co-authors) in all fields but only in some specific disciplines. Indeed, an ERC grant increases the probability to receive other grants in the near future.**

This paper estimates the causal impact of receiving a European Research Council (ERC) grant on researchers' productivity, excellence, research networks and the ability to obtain additional funding up to ten years later.

The ERC proposes grants for researchers of any nationality and age to carry out a research project in an EU Member State or Associated Country. The selection of the research proposals is based on excellence. The authors collect information on winning and non-winning ERC applicants between 2007-2013 and they employ a matching algorithm to collect information on all their publications on Scopus until April 2021.

They use a regression discontinuity design (RDD), comparing the outcomes of the winning and non-winning applicants around the eligibility cut-off. To assess productivity and excellence, they consider the number of published articles, the share and the number of articles published in journals ranked among the top 1% and the h-index (an author-level metric that measures both the productivity and citation impact of the publications). To assess the impact on the research networks, they consider the number of distinct co-authors, and the number of distinct funds received (by the network of co-authors).



They demonstrate that there is no overall effect of grants on productivity and excellence, with some exceptions in specific sub-fields, and no effect on research networks, as measured by the number of distinct co-authors. However, they find strong evidence that receiving a grant increases the probability to receive other grants in the near future, especially for Advanced grants in Physical Sciences and Engineering domain. This is known as the Matthew effect in the literature.

The authors conclude that ERC grants do not improve significantly researchers' productivity in all fields but they do have some impact in specific sub-fields. Moreover, they demonstrate a clear Matthew effect.

ERC AND RISKY RESEARCH

Veugelers, R, J Wang and P Stephan (2022), "Do funding agencies select and enable risky research: evidence from ERC using novelty as a proxy of risk taking", NBER Working Paper 30320.

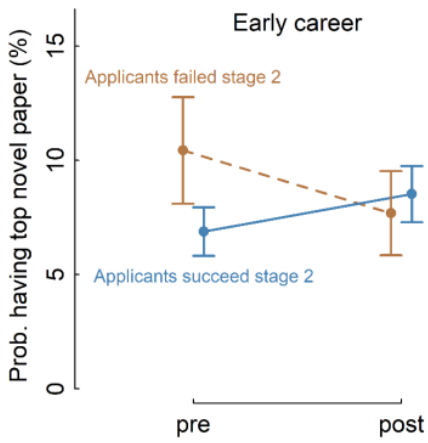
Messages	**1. Applicants with a history of risky research are less likely to be awarded European Research Council (ERC) funding, particularly in the case of early career scholars. 2. Being selected for an ERC grant does not change the research risk attitude of the researchers.**

This paper investigates how the riskiness of the research projects of an applicant affects the likelihood of being awarded an ERC grant. ERC funding is awarded on the basis of pan-EU competition for bottom-up proposals, in all fields of scientific disciplines.

Since its creation in 2007, the ERC has had high-risk/high-gain research as its core mission. Risk aversion on the part of the science funders is of particular concern because scientific breakthroughs are generally characterized as requiring risk-taking and a tolerance for failure, particularly in their early phases. The ERC tries to promote risk-taking behaviours by promising a large sum of research funds, a high level of freedom in conducting the research and assembling a team, and a relatively long duration of funding.

The authors use a data sample of 10,036 ERC applications across 25 panels (indicating the scientific fields) and call years from 2007 to 2013. To proxy the risk profile of the researchers, applicants' publication information for the five-year period before the call is used. Practically, research riskiness and novelty is measured by looking at whether articles make first-time-ever combinations of scientific knowledge components (proxied by referenced journals), taking into account the difficulty of making such new combinations in terms of the intellectual distance between newly paired journals. Difference-in-difference methods are employed to estimate causal inference.

The authors find that researchers with a history of high-risk research are significantly less likely to be awarded an ERC grant. This result is in contrast with the ERC mandate of financing high-risk/high-gain research. Furthermore, the results show that the risk of adverse selection bias is stronger for early career applicants, meaning that ERC evaluation panel members are less willing to tolerate risk for early career than for advanced career applicants. It is also found that funded applicants, compared to non-funded ones do not engage in more novel/risky research after the grant period (with the exception of early career researchers, who do).



EU R&D GRANTS AND INDUSTRY 4.0

Muscio, A., & Ciffolilli, A. (2020). What drives the capacity to integrate Industry 4.0 technologies? Evidence from European R&D projects. Economics of Innovation and New Technology, 29(2), 169-183.

Messages	**1. The 7th European Framework Programme for research and innovation (FP7) facilitated technological development via knowledge sharing across a multitude of regional actors and by promoting the accumulation of physical and human resources.** **2. Establishing good networks can help developing regions to reach greater capacities to integrate Industry 4.0 technologies despite their economic conditions.**

This paper looks into the question whether FP7 funding facilitated the integration of Industry 4.0 enabling technologies (measured with the Herfindahl-Hirschman Index of Diversification (HHID) and the Shannon Diversity Index (SDI) using FP participation by region and technology). FP7 was active from 2007 to 2013 and aimed at promoting research excellence, by supporting high-risk basic and applied research, and promoting networking between organisations and regions and mobility of researchers across Europe.

The authors employ data with information on FP7 project participations extracted from CORDIS, and Eurostat data on regional research and economic conditions. To explore if FP7 was successful in promoting the diffusion of Industry 4.0 enabling technologies, the authors first classified the FP7 funded projects by technological areas, and then performed econometric analysis.

Since there is no established classification of Industry 4.0 enabling technologies, the enabling technologies defined in the Italian strategy for Industry 4.0 are used: advanced manufacturing, additive manufacturing solutions, augmented reality, simulation, horizontal/vertical integration, industrial internet & cloud, cyber-security and big data and analytics.

The authors find that EU research funding has a significant positive effect on the intensity of collaborations and on the capacity to integrate Industry 4.0 technologies. Particularly, interregional collaborations increase the likelihood to be exposed to different technological areas. Networking, particularly for less developed regions, is found to be a key asset to integrate Industry 4.0 technologies.

Given the presented results, the authors suggest that national and regional governments have an important role in facilitating the catching-up of developing regions, not only by reinforcing the local capacity to develop Industry 4.0 technologies but also by encouraging knowledge transfer via interregional and transnational cooperation.

Enabling technology	No. of projects	No. of individual participations	Project cost (EUR)	% of total cost
Additive manufacturing	53	562	246,448,171	4.59
Advanced manufacturing solutions	297	3,245	1,550,457,984	28.85
Augmented reality	337	2,844	1,531,169,613	28.49
Big Data and Analytics	149	1,294	627,181,239	11.67
Cyber-security	61	571	264,466,130	4.92
Horizontal/Vertical integration	8	99	43,916,966	0.82
Industrial Internet & Cloud	151	1,778	969,159,478	18.03
Simulation	36	466	141,417,810	2.63
Total	1,092	10,859	5,374,217,389	100.00

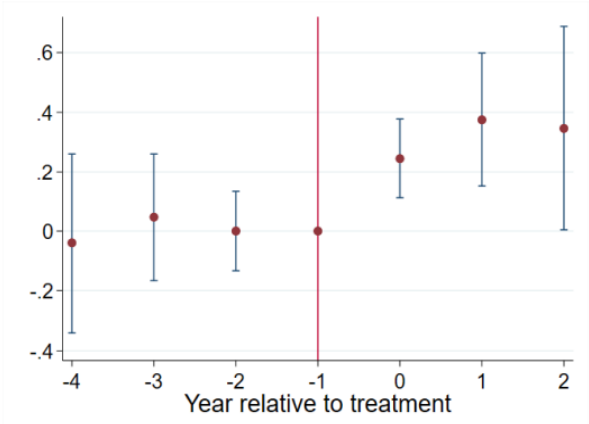
EIB VENTURE DEBT AND FIRMS' PERFORMANCE

European Investment Bank, Impact assessment of EIB venture debt, Publications Office of the European Union, 2022.

Messages	**1. EIB venture debt has a positive impact on beneficiaries' performance and ability to raise additional debt, suggesting a crowding-in effect. 2. The venture debt instrument shows significant economic additionality for its recipients.**

The paper presents the first impact assessment of the EIB venture debt instrument, which provides a long-term loan to European fast-growing innovation-driven companies that have typically already raised venture capital. The impact assessment exploits information on loans signed between January 2015 and June 2021, amounting to a total of EUR 2.65 billion (about 0.8% of the total EIB portfolio).

Figure 5. The effect of venture debt on total assets of firms



To assess the impact of the EIB venture debt on its beneficiaries' performance, the authors perform a counterfactual analysis with a Difference-in-Difference (DID) estimation technique, comparing companies that benefitted from the instrument with that of firms presenting similar characteristics but which did not receive any venture debt.

Specifically, the control group is built using data on venture capital deals, provided by Preqin, an international deal-level database containing more than 200,000 venture capital transactions and information on different financing rounds. Firms are then included in the control group based on characteristics: such as VC funding, number of employees, total assets, fixed assets, etc.

On average, EIB venture debt beneficiaries report total assets that are almost 25% higher than in the year prior to signature of the loan. Additionally, the increase in total assets appears to be partially driven by additional debt funding, suggesting that EIB venture debt beneficiaries benefit also from the crowding-in of additional debt. The results also show a positive and significant impact on firms' value added, while results on turnover, employment and innovation are positive but not statistically significant (potentially due to limitation in the data availability).

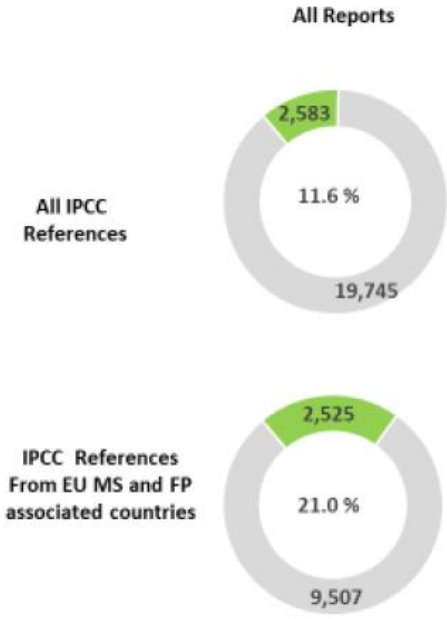
Overall, the paper' findings highlight the potential of venture debt financing, providing evidence on the positive and significant additionality that this type of instruments can bring to its recipients.

EU-FUNDED SCIENCE AND GLOBAL CLIMATE ACTION

European Commission, Directorate-General for Research and Innovation, Mugabushaka, A., Rakonczay, Z., (2022), Informing global climate action : contribution of the Framework Programmes (FP7 and H2020) to the knowledge base of recent IPCC reports based on openly available data, Publications Office of the European Union.

Messages	**1. Through the Framework Programme, the EU is among the top funders of the research referenced in the IPCC reports. 2. About 12% of all references cited in these reports was funded at EU level.**

What is the contribution of EU funding to the evidence base that underlies the Intergovernmental Panel on Climate Change (IPCC) reports? In this paper, the authors use references from these reports and crosscheck them with publications originating from EU-funded research.



The analysis focuses on the reports of the IPCC's 6th assessment cycle and processes the references of the reports published so far. For publications from EU-funded projects, the authors use data from the 7th Framework Programme (FP7) and Horizon 2020 (H2020). They combine publications reported by grant holders and publications indexed in OpenAIRE Research Graph.

The matching yielded over 2500 publications to which FP7 or H2020 have contributed, produced by 680 projects.
The data shows that the weight of EU-funded publications in IPCC references is fairly constant across all the reports. The highest share of EU-funded research is found in the references of the most recent working group contribution to Assessment Report 6 on physical science basis. They account for 14 % of all references and a quarter of all references from framework programme countries.
The part of the EU programme with the highest number of publications referenced in IPCC reports is the one focusing on environment and climate change, both in FP7 (over 1000 publications) and in H2020 (over 500 publications). It is followed by the European Research Council (ERC), with about 600 and 200 publications for FP7 and H2020, respectively. Other sub-programmes with a high number of publications are Marie Skłodowska-Curie Actions, Space, and Infrastructure.

Overall, the analysis shows that the EU, through the Framework Programme, is among the top funders of the research referenced in the IPCC reports.

WHAT CAN WE SAY ON EU-FUNDED PATENTS?

European Commission, Directorate-General for Research and Innovation (2022), Patents in the Framework Programme: from Horizon 2020 to Horizon Europe, Publications Office of the European Union.

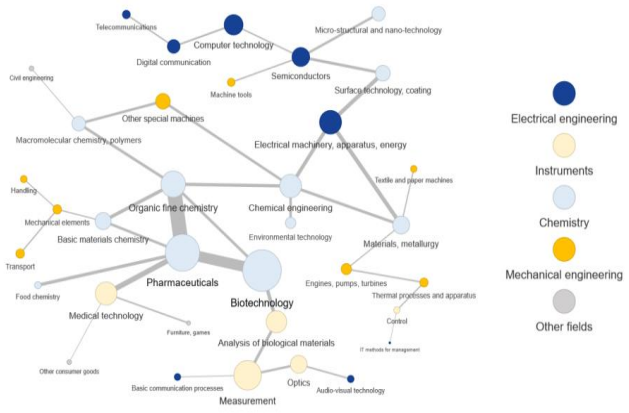
Messages	**1. There is a considerable time-lag between Framework Programme activities and patenting activity 2. FP patents seem to be more interdisciplinary and to show higher market value. 3. Monitoring patents resulting from a funding programme still presents significant challenges.**

Patents incentivise inventors to pursue R&I activity, they codify knowledge created and help its diffusion. Whereas patents do not fully capture everything that results from R&I activities, and represent only one possible way to protect intellectual property, they are currently still one of the most widely used indicators of innovation.

This paper sheds further light on patents and patenting activity of innovators benefiting from the two latest Framework Programmes (FP) – FP7 (2007-2014) and Horizon 2020 (2014-2020), based on self-reported project results.

FP self-reported inventions present several characteristics: they mainly relate to the health sector in areas such as biotechnology, pharmaceuticals or organic chemistry; they are more interdisciplinary than random patents; they have in general higher estimated values compared to the market averages; more than half of the inventions are owned by SMEs and 32% by organisations active in professional, scientific and technical sector; the majority of FP inventions are owned by organisations located in Europe (75%).

Figure 5 Network structure of links between technology classes of FP inventions published in 2009-2018



Additionally, the analysis shows a considerable time-lag between FP activities and potential exploitation through patents. A question for the future is whether these time-lags can be reduced through targeted interventions.

Although the data has limitations and shows significant quality and tracing challenges, it still provides important insights that may not be easy to retrieve through other sources. With increased data and analytics capacity in the future, the current caveats can be minimised. The paper also identifies a need of a much deeper analysis to better understand and monitor the existing patent and other IPR classifications against the EU policy objectives.

EU FUNDING AND AGRO-FOOD NETWORK

De Arroyabe, J. C. F., Schumann, M., Sena, V., & Lucas, P. (2021). Understanding the network structure of agri-food FP7 projects: An approach to the effectiveness of innovation systems. Technological Forecasting and Social Change, 162, 120372.

Messages	**1. The European Union (EU) Research and Innovation (R&I) Framework Programme (FP) shaped a well-connected Agri-Food network that makes up the innovation system (IS) at the European level. 2. Two organisations have a relatively high level of connectivity in this innovation system: Stichting Dienst Landbouwkundig Onderzoek Alterra and Institut National de la Recherche Agronomique. 3. Besides research centres and universities, a relatively high level of SMEs are part of the network, which gives a proper blend of research generators and users.**

This paper studies the properties of the European Agri-Food network generated by the EU-funded research consortia.

This is done by using a social network analysis to describe the topological properties of the Agri-Food network funded by the EU R&I FPs. The analysis is performed with the use of a dataset containing 224 research consortia funded by the FP7 initiative entitled Knowledge-Based BioEconomy (KBBE - Activity 2.1) between 2008-2014. The dataset contains 1529 organisations from all EU Member States. Via social network analysis, the position of each organisation in the network is measured through different centrality measures.

The results show that the degree centrality of the five largest countries (Germany, France, UK, Spain and Italy) is quite balanced (ranging from 0.237 to 0.345), while in the case of smaller countries there is more heterogeneity

Although it is a connected network, the density level is low, each node (organisation) only connects with 2.6% of the nodes (39 nodes on average). These results show a very sparse network, which is a negative aspect under the prism of the R&D policy, as it hinders access to information and a priori hinders the establishment of future collaborations.

Table 7
Positional Indicator by countries in Agri-food network*.

Countries	Degree	Betweenness	Closeness	Eigenvector
ES	0.02424	0.0008	0.00064	0.02356
GB	0.02919	0.00068	0.00074	0.03019
DE	0.0237	0.00027	0.00062	0.02642
IT	0.02752	0.00068	0.00071	0.03024
FR	0.03456	0.0025	0.00084	0.03882
NL	0.03626	0.00477	0.00089	0.04153
BE	0.02683	0.00069	0.00068	0.03352
GR	0.02515	0.00077	0.00067	0.02319
DK	0.04587	0.00257	0.00105	0.0525
CH	0.03091	0.00108	0.00075	0.03672

From a policy perspective, the study underlines that belonging to research consortia provides benefits for the institutions and firms that participate in the European programs, by financing the projects but also by obtaining social capital by establishing relationships with other partners, who in turn have participated in previous projects acquiring knowledge and information. For this reason, participation in EU innovation programs is crucial to improve on connectivity of EU sparse innovation network.

REFERENCES

Corinna Ghirelli, Elena Meroni, Stefano Verzillo, 'The Impact of ERC Grants on Scientific Productivity and Excellence', WP

De Arroyabe, J. C. F., Schumann, M., Sena, V., & Lucas, P. (2021), 'Understanding the network structure of agri-food FP7 projects: An approach to the effectiveness of innovation systems', Technological Forecasting and Social Change, 162, 120372.

European Commission, Directorate-General for Research and Innovation, Mugabushaka, A., Rakonczay, Z. (2022), 'Informing global climate action : contribution of the Framework Programmes (FP7 and H2020) to the knowledge base of recent IPCC reports based on openly available data', Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2777/928125

European Commission, Directorate-General for Research and Innovation (2022),' Patents in the Framework Programme : from Horizon 2020 to Horizon Europe, Publications Office of the European Union', https://data.europa.eu/doi/10.2777/789674

European Investment Bank (2022), 'Impact assessment of EIB venture debt, Publications Office of the European Union', https://data.europa.eu/doi/10.2867/032612

Muscio, A., & Ciffolilli, A. (2020), 'What drives the capacity to integrate Industry 4.0 technologies? Evidence from European R&D projects', Economics of Innovation and New Technology, 29(2), 169-183.

Pietro Santoleri, Andrea Mina, Alberto Di Minin, Irene Martelli (2020), 'The causal effects of R&D grants: evidence from a regression discontinuity', LEM Papers Series 2020/18, Laboratory of Economics and Management (LEM), Sant'Anna School of Advanced Studies, Pisa, Italy.

Tucci, G. K. P. M. F. (2020), The Impact of EU Grants for Research and Innovation on Private Firms' Performance, knowledge4policy.ec.europa.eu

Veugelers, R, J Wang and P Stephan (2022), "Do funding agencies select and enable risky research: evidence from ERC using novelty as a proxy of risk taking", NBER Working Paper 30320.

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The "Quarterly R&I Literature Review" provides a brief summary of a selection of recent publications on R&I economics and policy.

The aim of the Review is to inform policymakers on the latest findings from the literature that links R&I economics to R&I policy.

This edition of the literature review covers papers that focus on the role of education for R&I, from the construction of human capital, the production of knowledge at the hand of highly skilled individuals, to the interaction between the different entities that compose the innovation ecosystem.

The Literature Review, together with the Working Papers and the Policy Briefs, is part of the "R&I Paper Series" which serves as a repository of analytical papers that supports an evidence-based EU policy, for R&I and beyond.

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