

Διερευνώντας τα κίνητρα, τα εμπόδια
συμμετοχής και τον αντίκτυπο των ευρωπαϊκών
ερευνητικών προγραμμάτων στους
συμμετέχοντες ελληνικούς φορείς

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18ο Ετήσιο Σεμινάριο της Ερμούπολης για την Κοινωνία της
Πληροφορίας και την Οικονομία της Γνώσης

14-16 Ιουλίου 2023

Research Objective

This paper aims at investigating:

- **Incentives** of Greek firms and research groups for participation in FPs
- **Enablers and barriers** for participation in FPs
- **Benefits that young and established Greek firms and research groups acquire through their participation in FPs** (scientific results and technological advancement, product, process or organisational innovation, productive and economic benefits, knowledge-intensive entrepreneurship, networking enhancement etc.),
- **Enablers and barriers for benefits creation**
- **Added Value of FPs** compared to national research funding programmes

The concept of Additionality

Additionality is a key concept of Research, Technology and Innovation (**RTI**) **policy evaluation** and refers to the question of what difference is made by a public intervention and whether the difference justifies the intervention (Gök and Edler, 2012; Hyvärinen and Rautiainen, 2007). It has been developed around three dimensions (Breschi and Malerba, 2009).

- **‘Input additionality’** deals with the issue of whether public expenditure has created additional funds to be spent and on what thematic areas are they spent.
- **‘Output additionality’** deals with the question of whether public expenditure generated additional private and social returns.
- **‘Behavioral/outcome additionality’** addresses the issue of whether public expenditure created sustainable effects beyond the infusion of resources and outputs such as improving the knowledge base, capabilities, organization and firm strategies.

Methodology

- The research work is based on **25 case studies** conducted in **business firms (9)** and **research groups of Greek Universities (10)** and **Research Centers (6)**.
- The case studies were based on interviews (22 online due to Covid-19 restrictions and 3 face-to-face, each one conducted by 2 researchers) completed in July 2022 with:
 - a) an appropriate firm's executive i.e. the head of the R&D department or the owner/founder of the firm,
 - b) the head of the research group that had the scientific responsibility of at least an EU-funded research project.
- The interviews were conducted using a **semi-structured questionnaire** which included open-ended questions.

Methodology

- The **questionnaire development** was based on the project's Conceptual Framework and utilized other questionnaires that focused on specific dimensions of our research objectives (e.g. European Commission, 2015; De Prato et al., 2015; Clarysse et al., 2009) as well as the previous experience of LIEE's research team on this field (e.g. Protogerou et al., 2010; Caloghirou et al., 2004; Tsakanikas, 2002).
- The questionnaire was **initially tested in 2 firms and 2 research groups** in order to check whether a) it is appropriate to serve the case studies' research objectives, and b) the questions are clear and understandable by the interviewees.
 - Based on the pilot testing's feedback, several modifications were made to produce an improved final version of the questionnaire.

Questionnaires' Structure

Firms

- A. General information about the Firm
- B. Business strategy
- C. Firm's strategy for R&D and participation in FPs
Motives and obstacles to participate
- D. Questions for a specific H2020 project:
 - a) Project characteristics (content, TRL, problems etc.)
 - b) Firm's role and objectives
 - c) Outcome of the project (for the firm and broadly)
 - d) Enablers and barriers for each type of outcome
 - e) Collaboration patterns and knowledge flow mechanisms
 - f) Additionality of the project for the firm
- E. Added Value of FPs compared to national projects

Research Groups

- A. General information about the Research Group (RG)
- B. RG's strategy for R&D and participation in FPs
Motives and obstacles to participate
- C. Questions for a specific H2020 project:
 - a) Project characteristics (content, TRL, problems etc.)
 - b) RG's role and objectives
 - c) Outcome of the project (for the RG and broadly)
 - d) Enablers and barriers for each type of outcome
 - e) Collaboration patterns and knowledge flow mechanisms
 - f) Additionality of the project for the RG
- D. Added Value of FPs compared to national projects

Basic characteristics of the case studies' sample – Selection Criteria

- 9 Firms
 - **3 young micro firms:** 1 spin-off (2019) and other two young firms (2017 & 2012) in a) laser technologies applied in medicine, b) biotechnology, and c) nanotechnology respectively
 - **6 established firms:**
 - 5 Large firms in a) cosmetics, b) telecommunications, c) mining, d) energy storage systems, and e) primary and secondary education.
 - 1 Medium-sized firm in design and production of industrial equipment
- 16 Research Groups (RGs)
 - **9 RGs from 4 Universities and 3 Research Centres** (based on the 3 largest cities) included in the **100 top European Organisations** in terms of **FPs participation and position centrality** in the relevant research networks
 - **7 RGs from 4 Universities and 3 Research Centres** with **relatively high FPs participation** as well. A part of them are based on **non-central regions** of the country.
 - Various scientific fields: Medicine, pharmaceuticals, biology, software, chemical engineering, environmental technologies, biomedical engineering, material science, energy technologies etc.

Research Findings

Incentives for participation in FPs

Firms

- Networking and building solid cooperation with other entities
 - Continuous and systematic research collaboration with research bodies and/or other firms, access to new customers, and promotion and enhancement of firm's image.
- Access to funding
 - Especially important and vital for young firms
- Strengthening existing / creation of new know-how
 - Enhancing their innovation capability in long term and in turn entering new markets and strengthening their competitive position
- Monitoring key technological developments / cutting edge technologies
 - Particularly for large firms

Research Groups

- Access to funding
- Maintaining and strengthening their human resources
- Evolving their research activity and monitoring developments in cutting-edge fields
 - Expanding the field of their activities and enhancing the interdisciplinarity of their work.
- Networking and building solid cooperation with other entities at a European level
 - Enhancing the research group's visibility and scientific reputation
- Enhancing of technological infrastructure
 - It depends on research group's scientific/technological field

Research Findings

Enablers and barriers for participation in FPs

Enablers

- The **already established networking** with other entities from Europe and Greece in combination with **reputation building**, favour the entrance in new proposals/consortiums.
 - The relations with Greek research groups is critical for **firms' participation** in FPs and particularly the smaller ones.
- The **accumulated experience** of the research groups' and firms' staff in proposal submissions.
- **Availability of human resources** that can work on proposal preparation.

Research Findings

Enablers and barriers for participation in FPs

Barriers

- The **need to dedicate time and human resources** in the submission process.
 - This factor is **much more crucial in the case of micro firms and SMEs** as well as **small research groups**, as it implies a higher risk due to the more limited resources and the overall increased competition for getting funding.
- The **need** - stemming from the requirements of Horizon 2020 programme and after - to achieve the **formation of large and interdisciplinary consortiums**, on one hand **increases the complexity of the submission process** and on the other hand may make more vague the project's outcome and consequently the **expected business benefits**, especially for smaller firms.

Research Findings

Benefits for knowledge-intensive young firms

- Access to funding for maintaining-increasing their high-quality staff and generally their activity
 - FPs' projects constitute a significant part of their activity as they are characterized by high research intensity.
- Improvement-upgrading of their equipment
 - It is important for firms that do not focus on software development.
- Production of and access to new knowledge that can be utilized for improving their products, services or processes, that are not necessarily related to the specific project's intended output.
 - The direct exploitation of the research results is highly dependent on project's TRL.
- Enhancement of their networking and reputation
 - For continuing their collaborative research activity
 - For accessing new clients
- Enhancement of the skills and knowledge of their staff.

Research Findings

Benefits for Established Firms

- Monitoring of basic technological trends and cutting-edge technologies
- Enhancement of firms' technological knowledge and capabilities - without taking high risk - that can be used in many ways i.e. new product development, process improvement or even entrance to a new technological field and market.
- Improvement of firms' R&D capabilities through the maintenance and increase of R&D staff, improvement of researchers' skills and attitude, and enhancement of R&D infrastructure.
- Networking with other European firms and research groups that provide opportunities for further research activity and business cooperation.
- Enhancement of firms' reputation to potential clients (businesses or even individuals, for instance in the case of a large private school)

Research Findings

Benefits for Research Groups

- Production of publications (a high ratio of them in cooperation with other partners).
- Knowledge accumulation in a research area which the group is already active
- Significant increase of the interdisciplinary research collaborations.
- Enhancement of the researchers' R&D experience, knowledge and skills as well as their soft skills
 - This fact widens their career opportunities (in the academic/research, business or public sector)
- Strengthening the research group with new researchers.
- Networking with research groups from other European countries that creates the possibility for further research cooperation
- In some cases:
 - the projects were important for enhancing the laboratories' infrastructure,
 - the educational activity has been improved through the utilization of project results.
- A lower number of cases regards the commercial utilization of research results.

Research Findings

Enablers/Barriers for benefits creation

Enablers

- A mix of partners that are characterized by high knowledge and competence in their field and complementarity regarding the objectives of the project.
- An effective mechanism of collaboration and bidirectional knowledge flow-transfer within the consortium as well as with external entities.

Research Findings

Enablers/Barriers for benefits creation

Barriers

- Significant delays in acquiring the prescribed research equipment due to irrational bureaucratic procedures of the Greek legislation.
- Absence of a common view between partners regarding project's aim and output, especially in cases of very large consortiums that demand a very competent coordination.
- Absence of a follow-up funding mechanism for utilizing research results.
- Vague framework regarding Intellectual Property Rights, this is a critical problem particularly in cases of large consortiums that includes large firms.
- The inadequate involvement of the end-user partners (business firms or public organisations) has a negative effect on innovation production and utilization.
- In the cases of specific technological fields / economic sectors (e.g. energy), the technological standards and regulatory framework play a significant role.

Research Findings

Added Value of FPs compared to national research funding programmes

- Possibility of building international research networks
- Higher funding of projects
- Better access to knowledge and research infrastructures
- Lower administrative costs
 - The national programs financed through the NSRF are characterized by high bureaucracy that burdens firms and research groups in terms of man-hours, and also by procedures-requirements (guarantee letters, etc.) that often create liquidity problems for firms and especially for small/micro ones.

Conclusions

- **Input additionality** for firms and research groups
 - The majority of them would not have carried out the specific research activity if they had not been funded through the specific research project.
- **Output additionality**
 - **In general for the project**
 - TRL increase
 - Development of a pioneer-innovative product, service or/and process
 - **For firms**
 - Limited patent applications
 - In general, low immediate commercialization of research results
 - **For research groups**
 - Publications production, most of them jointly with other partners
 - Low commercial exploitation of research results and creation of spin-offs

Conclusions

- **Behavioural-outcome additionality**

- **For firms:**

- Improving of their human resources' skills and culture, strengthening their know-how
- enhancing organizational capabilities such as the ability to conduct R&D, technological and innovative capability, capability for networking and (research) collaborations, as well as their cognitive and absorptive capacity.

- **For research groups:**

- Maintaining current / attracting new researchers, improving their knowledge, skills and culture for cooperation with foreign researchers and in some cases with end users, enhancing the mobility and career options of researchers.
- Strengthening their networking
- Improving their infrastructures that can be used for other research activities afterwards

Policy Implications

The set of policy measures for increasing the impact of FPs on economy and society should have **two directions**:

1. The higher utilization of FPs' research output

- a) Increase of funding opportunities for the commercial exploitation of research results (*European and national level*)
- b) Mechanisms for much higher involvement of the potential end-users, especially in cases of research activity with high potential social benefits. (*European and national level*)
 - Promotion and dissemination actions to engage the whole stakeholder ecosystem.
 - Enhancement of the public organisations' capacity to utilise the developed technologies.
- c) Mechanisms for the collection of all the publicly available pool of knowledge that is produced through different projects and relates to the same social or environmental challenge. (*European level*)

2. The higher participation in FPs of knowledge-intensive (KI) entities

- a) Mechanisms for supporting the participation of KI firms and small research groups in proposal submissions: management-consulting and networking services as well as financial incentives (*National level and Organisation level, i.e. Universities & Research Centres*)

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