The participation of Greece in European Research Programmes

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This study has been conducted in the context of a research project supported by the Hellenic Foundation for Research and Innovation (H.F.R.I.) under the “1st Call for H.F.R.I. Research Projects to support Faculty Members & Researchers and the procurement of high-cost research equipment grant” (Project Number: HFRI-FM17-3087), Principal Investigator: Yannis Caloghirou, NTUA Emeritus Professor.

Basic objectives of the research project

1. To analyse the **participation and role of Greek organisations** in the EU-funded collaborative research networks for more than 35 years, i.e., covering the seven Framework Programmes-FPs (1984-2013) and Horizon 2020 (2014-2020).

2. To explore the **impact of FPs on participating organizations** focusing on:
   a) **Benefits** arising from their involvement in terms of **scientific impact, economic and innovation impact,** as well as **networking and social impact**.
   b) **Facilitators/inhibitors** of potential benefits

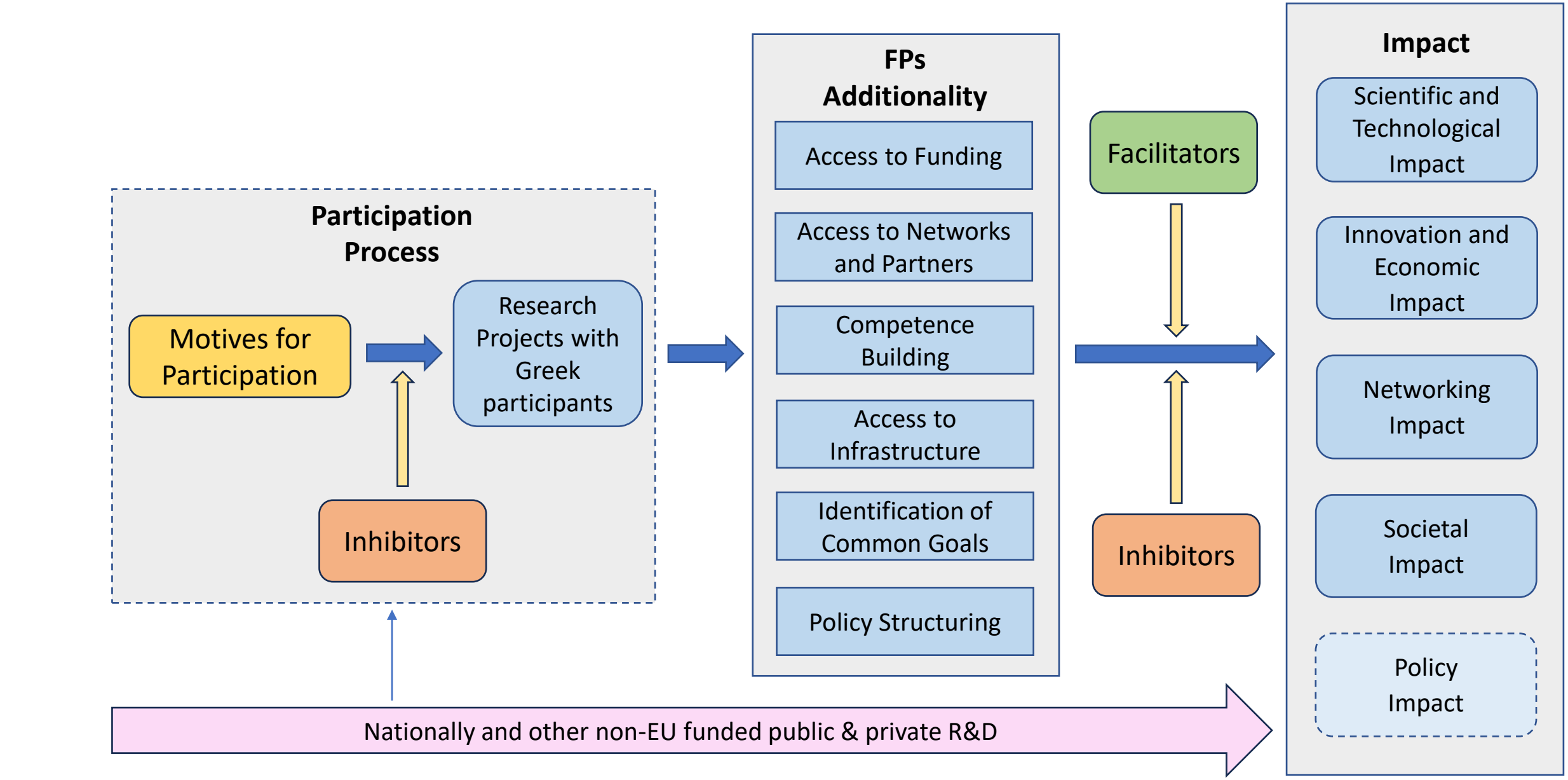
EU-funded Framework Programmes (FPs)

- Funded programmes created by the EU to strengthen research in the European Research Area which is a “single borderless market for research, innovation and technology across the EU” (EU, 2021).
- Basic pillars of European scientific and technological development, integration and cohesion since 1984
  - supporting all kinds of R&D, mainly in high technology sectors
  - favoring the participation of various organizations from different European countries
  - cultivating a sense-culture of a common European research policy in science and technology
- Project funding is allocated on a competitive basis (relevance, scientific excellence, potential impact, quality of consortium, quality of management etc.)

FPs: Evolution of rationale, priorities and budget

	Periods-budget (billion of €)	Emphasis of rationale	Main priorities	New actions
Before	1975-1983	Ad hoc basis	Fragmented	-
FP1	1984-1987 3.8	Supply or technology oriented: main aim to promote industrial competitiveness (technological catch up with global competitors)	Energy and ICT oriented	Environment, international cooperation human capital and mobility
FP2	1987-1991 5.4	Information Society	ICT oriented	Biotechnologies, marine resources, dissemination
FP3	1991-1994 6.6	Industrial competitiveness	Multiple priorities	
FP4	1994-1998 13.2	**Knowledge diffusion-oriented, increase of learning skills and knowledge**	Multiple priorities	Transport and social sciences
FP5	1998-2002 13.7	Shift towards the needs of the community and its citizens	Multiple priorities	Nanotechnologies
FP6	2002-2006 17.9	**Integration of research efforts by creating European Research Area** (ERA)	Multiple priorities	New instruments
FP7	2007-2013 50.5	Extension of the scope of the FP towards exploratory research and innovation activities	Multiple priorities	Security
Horizon 2020 (FP8)	2014-2020 77	Focus on excellence, industrial competitiveness and addressing grand societal challenges	Multiple priorities	Social challenges: health, food security, energy, transport, climate and environment, inclusive and secured societies
Horizon Europe (FP9)	2021-2027 95.5	Strengthen ERA, tackle policy priorities and sustainable development goals, boost innovation uptake, competitiveness and jobs	Multiple priorities	Research and innovation "missions" to tackle cancer, climate change, polluted oceans, and soil

NETonKIE's Conceptual Framework



Adapted from Piirainen at al., 2018

Multi-method empirical approach

Method	Objective	Data	Sample
Social Network Analysis (SNA) & STEP-to-RJVs" database	Provides insights for a longitudinal view of the **EU-funded research networks** regarding the **structure of network relationships** and **the position of individual organizations within them.**	**STEP-to-RJVs" database,** developed by LIEE-NTUA, **is the basis for SNA analysis** It includes detailed information on collaborative research projects for FP1-FP7 and H2020 • **41,960** research projects • **88,140** different organizations • **375,500** participations	• The population for Survey, Case Studies, and Desk Research drawn from the STEP-to-RJVs" database
Survey	Examines the **research strategy and participation in FPs** and focuses on the **impact of participating in a specific H2020 project.**	Data collected in 2022 (1st semester) using **two online structured questionnaires** (for firms and research teams)	• **103 business firms** • **157 research teams**
Case Studies	Studies **in more depth participation determinants in FPs and the** impact of participating in a specific H2020, focusing on facilitating and inhibiting impact factors	Data collection through **face-to-face interviews** (average duration: 85 mins) mainly in 2021 using **two semi-structured questionnaire versions**.	• **9 business firms** • **16 research teams**
Desk Research	Explores the characteristics of young firms that have participated in at least one FP research project (FP7 and/or H2020).	Information on organizational characteristics, entrepreneurial teams, innovative performance, and project roles were collected through desk research.	• **121 business firms** (established from 2010 onwards)

Survey and Case Studies Questionnaires

Firms

A. General Information about the Firm
B. Business Strategy
C. Firm's Strategy for Research and Participation in FPs: a) R&D activity, b) FPs participation intensity, c) Motivation
D. Questions for a specific H2020 project:
   a) Project characteristics, Firm's Role and Objectives, Problems.
   b) Benefits: Scientific-Technological, Innovation and Economic, Networking, Addressing Social and Environmental Challenges
   c) Additionality of the specific project
E. Added Value of FPs compared to national research projects

- **Additional research questions in Case Studies**
  - Section C: Inhibitors for participation in FPs
  - Section D: Facilitators and Inhibitors for benefits creation, prerequisites and necessary steps for innovation utilization

Research Teams (RTs)

A. General Information about the RT
B. RT's Strategy for Research and Participation in FPs: a) Funding Sources, b) FPs participation intensity, c) Motivation
C. Questions for a specific H2020 project:
   a) Project characteristics, RT's Role and Objectives, Problems
   b) Benefits: Scientific-Technological, Innovation and Economic, Networking, Addressing Social and Environmental Challenges
   c) Additionality of the specific project
D. Added Value of FPs compared to national research projects

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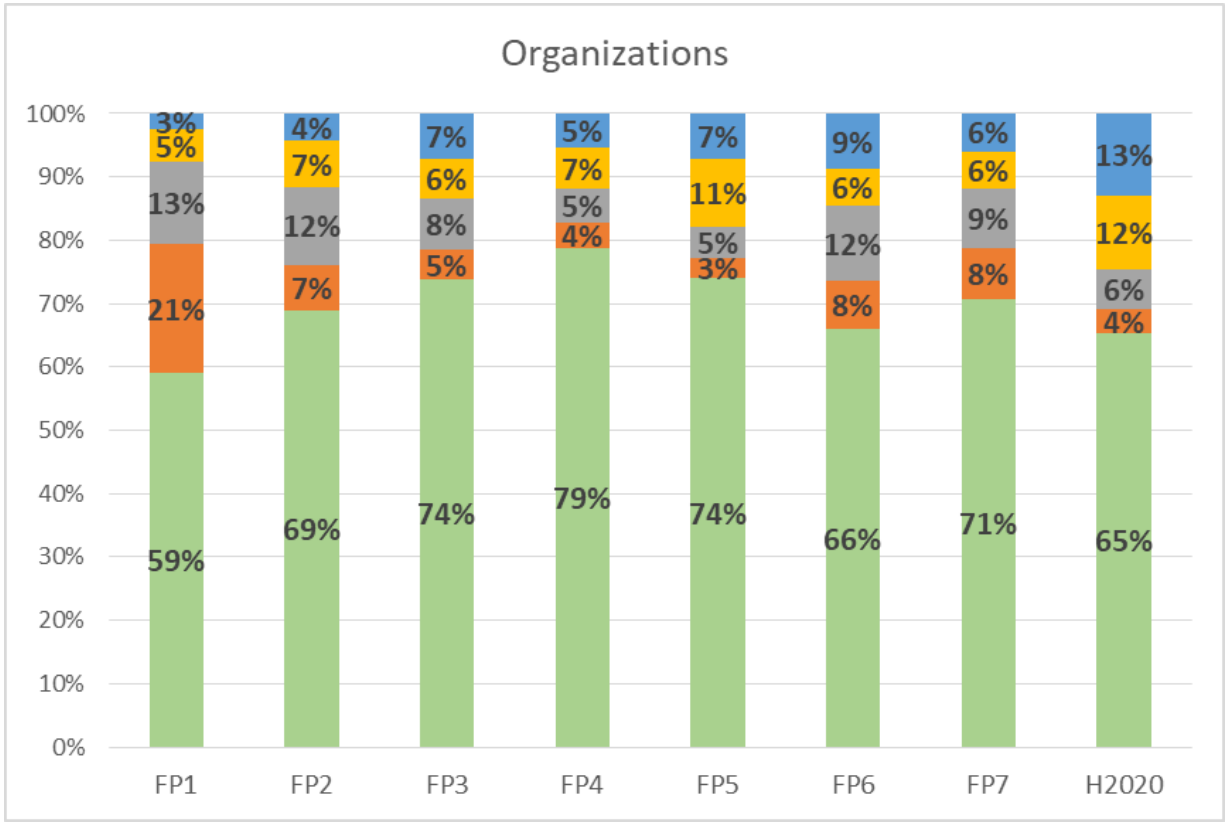
Selected findings: Participation Intensity and Networking (FP1-H2020)

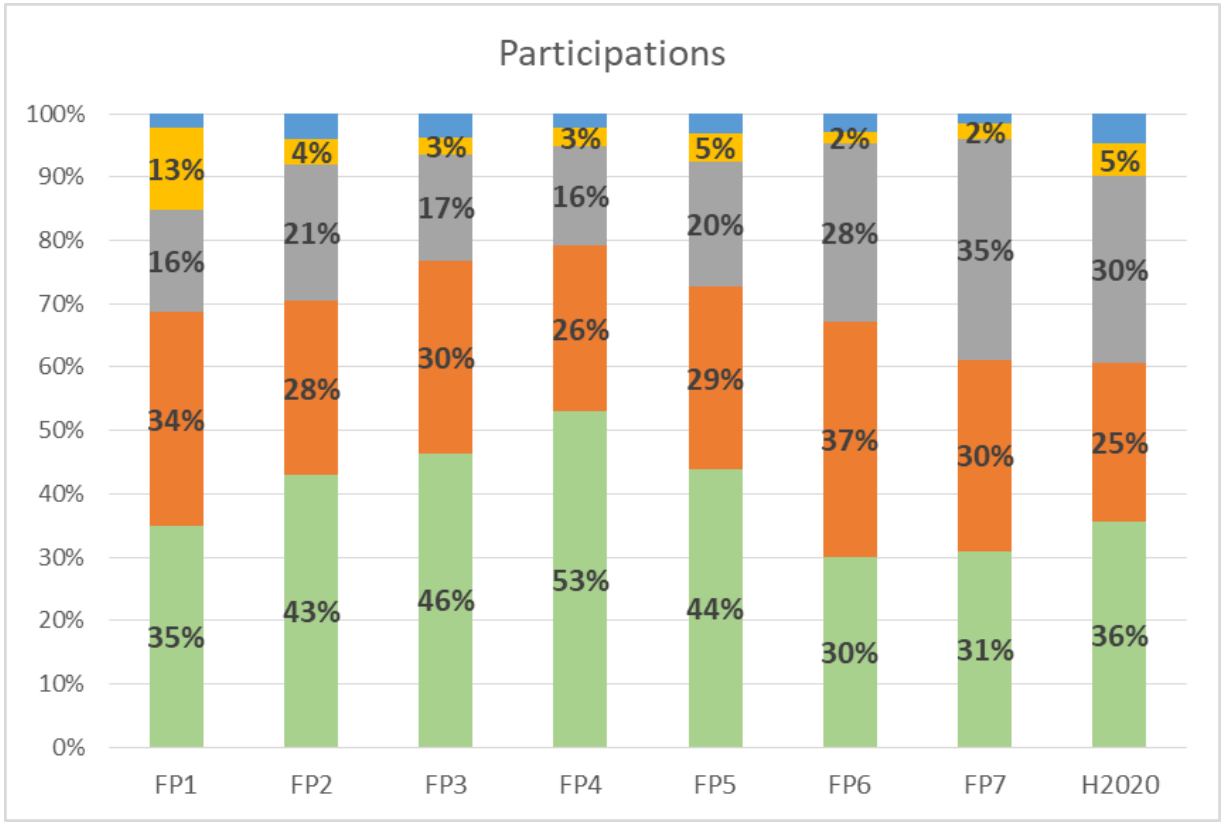
Participation and funding in EU-funded collaborative projects (FP1 – H2020)

	FP1	FP2	FP3	FP4	FP5	FP6	FP7	H2020
Number of organizations	40 **(11)**	141 **(10)**	279 **(8)**	498 **(9)**	638 **(9)**	356 **(11)**	621 **(10)**	990 **(9)**
Number of participations	86 **(9)**	448 **(9)**	734 **(8)**	1397 **(9)**	2252 **(7)**	1446 **(9)**	3574 **(9)**	5358 **(8)**
Number of participations as coordinators	14 **(10)**	41 **(9)**	77 **(9)**	153 **(9)**	335 **(8)**	121 **(9)**	426 **(8)**	554 **(8)**
Funding	-	-	-	€146.1M **(10)***	€459.5M **(9)***	€424.2M **(10)***	€861.5M **(10)**	€1.66B **(9)**

Source: STEP-to-RJVs Database
Note: Ranking among EU-28 countries in parentheses
* Data source: EC Horizon Dashboard

Participating organisations and participations by organization type (FP1 – H2020)





Participations and funding by organization type (Horizon 2020)

Organization Type	Participations	Funding	% of Total funding	Funding per participation
Firms	1904	492,404,982 €	29.7%	258,616 €
Universities	1340	461,314,307 €	**27.8%**	344,264 €
Research Centres	1585	636,455,464 €	**38.4%**	401,549 €
Public Organizations	279	35.543.143 €	2.1%	127,395 €
Other	250	33.463.040 €	2.0%	133,852 €

Central organizations by country in the 8 FPs (FP1 – H2020)

Ranking (top1%)	Country	Central Organizations		Peripheral Organisations
		Top 1%	Top 5%	
1	Germany	123	607	11859
2	United Kingdom	122	433	9048
3	France	100	492	8717
4	Spain	84	398	6671
5	Italy	79	458	7868
6	Netherlands	45	234	5118
7	Sweden	32	140	2552
8	Belgium	31	209	3401
9	Greece	28	135	2245
10	Austria	27	111	2116
11	Finland	23	93	1486
12	Portugal	21	111	1902
13	Denmark	18	98	1938
14	Poland	12	99	1423
15	Ireland	11	52	1184
16	Hungary	8	54	794
17	Czech Republic	7	56	772
18	Slovenia	4	21	590
19	Romania	3	30	872
20	Slovakia	3	17	382
21	Bulgaria	2	21	491
22	Cyprus	2	17	264
23	Estonia	2	11	305
24	Latvia	2	12	231
25	Lithuania	2	14	288
26	Luxembourg	2	12	228
27	Croatia	1	5	273
28	Malta	1	3	82

Greece ranks **9th** based on the **top-1%** and the top-5% **central organizations** among EU-28 countries

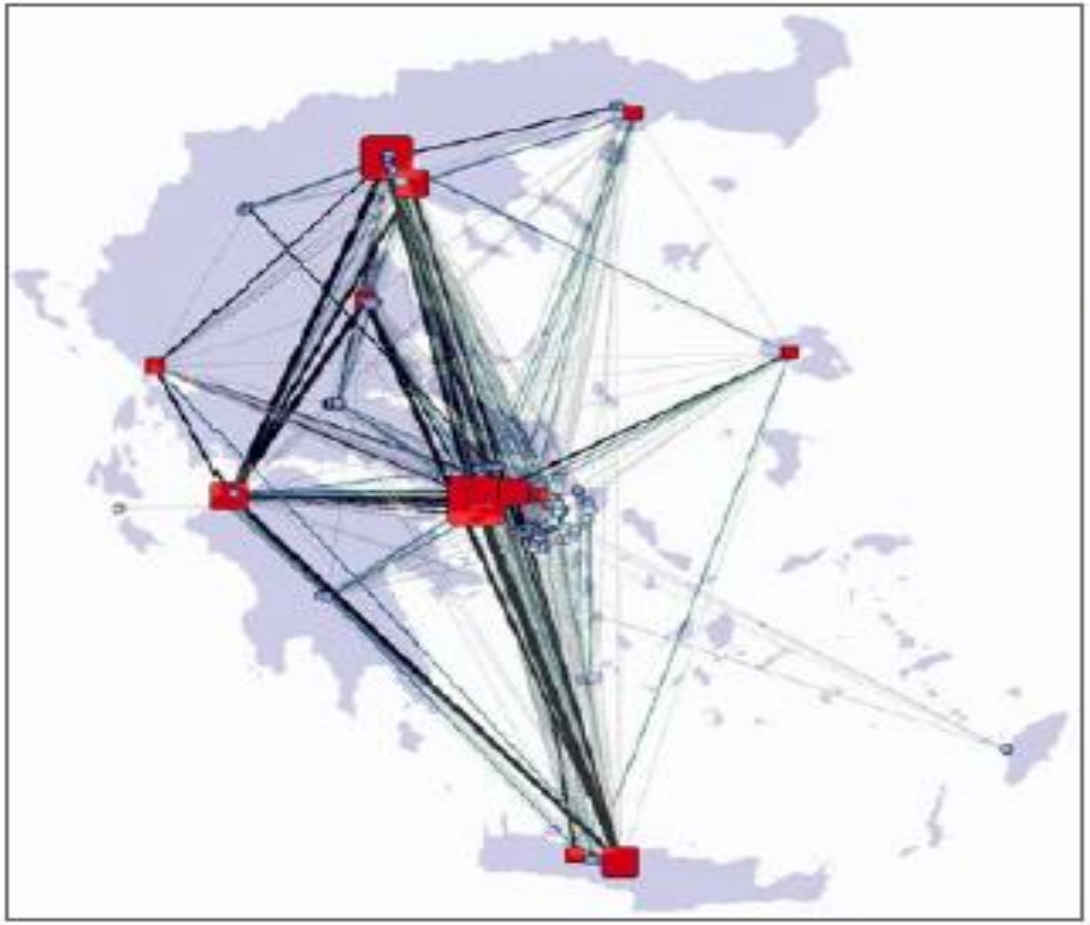
7 Greek universities and research centers ranked among the top 100 European organizations (FP1 – H2020)

	Organization Name	Organization Type	Ranking by Centrality (Total	Ranking based on Participations as Coordinator*	Ranking based on Total Participations*
1	National Technical University of Athens (incl. ICCS)	University	7	9 (147)	7 (1263)
2	Aristotle University of Thessaloniki	University	23	42 (73)	34 (523)
3	Foundation for Research and Technology - Hellas	Research Centre	29	20 (111)	26 (615)
4	University of Patras	University	36	92 (45)	44 (469)
5	National Centre for Scientific Research "Demokritos"	Research Centre	57	50 (64)	77 (356)
6	Centre for Research and Technology Hellas (CERTH)	Research Centre	61	15 (125)	30 (568)
7	National and Kapodistrian University of Athens	University	88	39 (116)	56 (424)
8	Centre for Renewable Energy Sources	Research Centre	171	201 (26)	143 (213)
9	Athens University of Economics and Business	University	226	986 (6)	314 (121)
10	INTRACOM	Industry	243	138 (34)	174 (187)
11	Agricultural University of Athens	University	258	317 (18)	278 (135)
12	National Observatory of Athens	Research Centre	319	659 (9)	365 (103)
13	Technical University of Crete	University	325	842 (7)	469 (82)
14	Hellenic Centre for Marine Research	Research Centre	331	986 (6)	339 (112)
15	ATHENA Research and Innovation Centre in Information, Communication and Knowledge Technologies	Research Centre	427	279 (20)	387 (98)

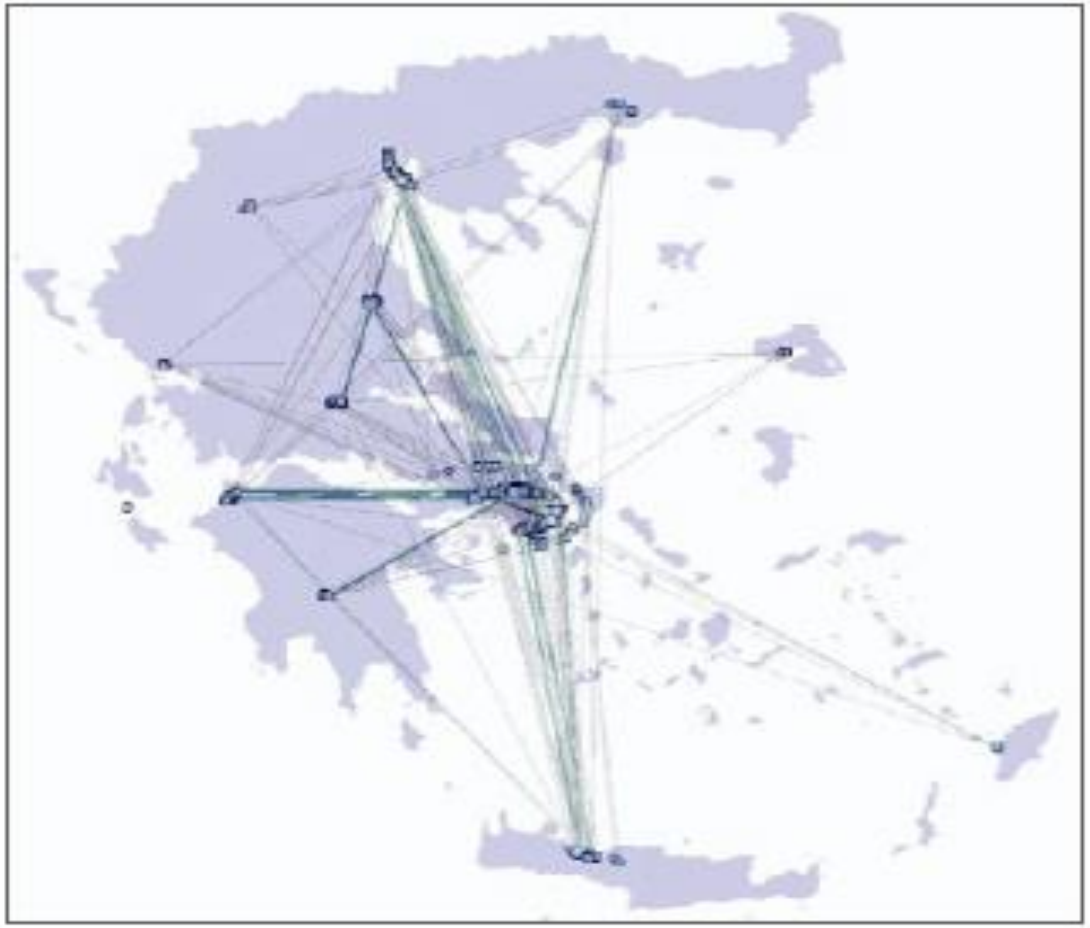
* Number of participations as Coordinator and total participations in parentheses.

Interconnection between Greek Organizations in the 7th Framework Programme

All Greek organizations



Central organizations are missing



Source: STEP-to-RJVs Database

Concluding remarks

- Greece exhibits a strong and stable (in the long run) presence in the EU FPs.
- The increased Greek participation intensity can be translated in both quantitative (number of participations) and qualitative terms (number of participations as coordinator).
- Greek organizations are embedded in a highly connected network which gains in cohesiveness through the years and allows for effective knowledge creation and exchange.
- Some Greek partners, mainly universities and research centres, have acquired an important, central role through time.
- Their role is not only important for the whole network (at a European level), but even more for the Greek peripheral and newcoming actors.

Thank you for your attention!

The research project was supported by the Hellenic Foundation for Research and Innovation (H.F.R.I.) under the "1st Call for H.F.R.I. Research Projects to support Faculty Members & Researchers and the Procurement of High-and the procurement of high-cost research equipment grant" (Project Number: HFRI-FM17-3087).

Appendix

Top 20 European organizations in terms of centrality in the research networks (FP1 – H2020)

Organization Name	Organization Type	Country	Ranking by Centrality	Ranking based on Participations as Coordinator*	Ranking based on Total Participations*
Fraunhofer Institute	Research	Germany	1	1 (538)	1 (3136)
Netherlands Organization for Applied Scientific Research	Research	Netherlands	2	5 (221)	5 (1505)
National Research Council	Research	Italy	3	4 (249)	3 (1578)
Technical Research Centre of Finland	Research	Finland	4	6 (206)	6 (1355)
National Centre for Scientific Research	Research	France	5	2 (291)	2 (2064)
European Atomic Energy Commission	Research	France	6	3 (273)	4 (1544)
National Technical University of Athens	Academic	Greece	7	9 (174)	7 (1263)
Catholic University of Leuven	Academic	Belgium	8	7 (201)	8 (1254)
Imperial College of Science	Academic	UK	9	13 (131)	9 (1065)
Aachen University	Academic	Germany	10	40 (75)	14 (836)
Technical University of Madrid	Academic	Spain	11	35 (80)	18 (751)
Swiss Federal Institute of Technology Lausanne	Academic	Switzerland	12	72 (54)	12 (897)
German Aerospace Center	Research	Germany	13	8 (180)	10 (1053)
Delft University of Technology	Academic	Netherlands	13	27 (94)	15 (816)
Polytechnic University of Milan	Academic	Italy	15	22 (109)	20 (714)
University College London	Academic	UK	16	11 (161)	11 (942)
Fiat SCpA Research Center	Research	Italy	17	19 (115)	16 (776)
University of Southampton	Academic	UK	18	54 (62)	25 (636)
Siemens AG	Βιομηχανία	Germany	19	15 (121)	17 (770)
University of Stuttgart	Academic	Germany	20	80 (52)	28 (578)