The participation and role of Greek young firms in Horizon 2020

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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.

Research Objectives

- To examine whether publicly-funded collaborative R&D networks can promote **knowledge-intensive entrepreneurship** by allowing **young firms** to
  a) **gain access** to a considerable amount of resources
  b) **develop relationships** with actors exhibiting a **high degree of diversity**
- To understand the **nature of young firms** participating in FPs by examining their **characteristics** (focusing on knowledge intensity) and their **role** in collaborative projects.

Methodology

1. **Social network analysis** to describe the **structural characteristics** and study the **network position** and **role** of young firms in FP7 and H2020, and to **investigate the collaboration patterns** developed among them and other network research actors (*ego networks*).
2. **Extensive desk research** to develop a database including information on Greek firms that have been established from 2010 onwards (i.e., **young firms**) and have also participated in at least **one** FP research project (FP7 and Horizon 2020).

   The database includes information on:

   a. **firm characteristics**, primarily **founding** teams and **employees** (primarily based on firms' websites and LinkedIn combined with in-person communication when required)
   b. the FP projects these firms have participated in (based on CORDIS and Innovation Radar)

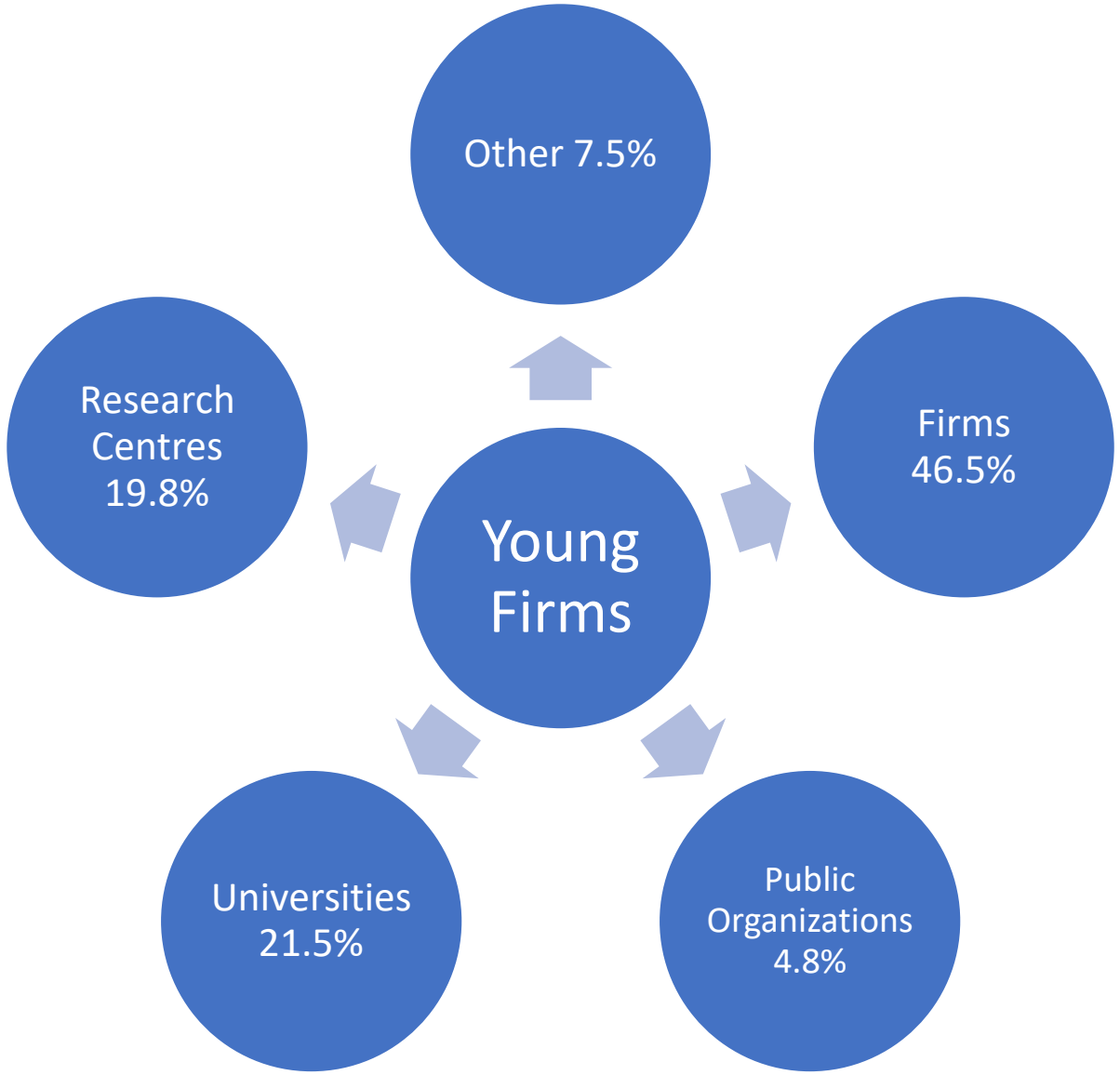
Key findings

Network structural characteristics: highly interconnected networks

	FP7	H2020
Nodes	456	4338
Edges	5467	91941
No. of components[1]	4	3
Size of Giant Component	425	4333
Edges of Giant Component	5342	91937
% of Giant Component	93.2%	99.88%
Density (x100)	5.27	0.977
Global efficiency	0.342	0.387
Clustering coefficient[2]	0.939	0.866
Characteristic path length[2]	2.91	2.71
Diameter[2]	6	5

[1] Excluding components with $size < 2$. [2] Referring to property of the Giant Component

Diversity of young Greek firm's collaborators (H2020)



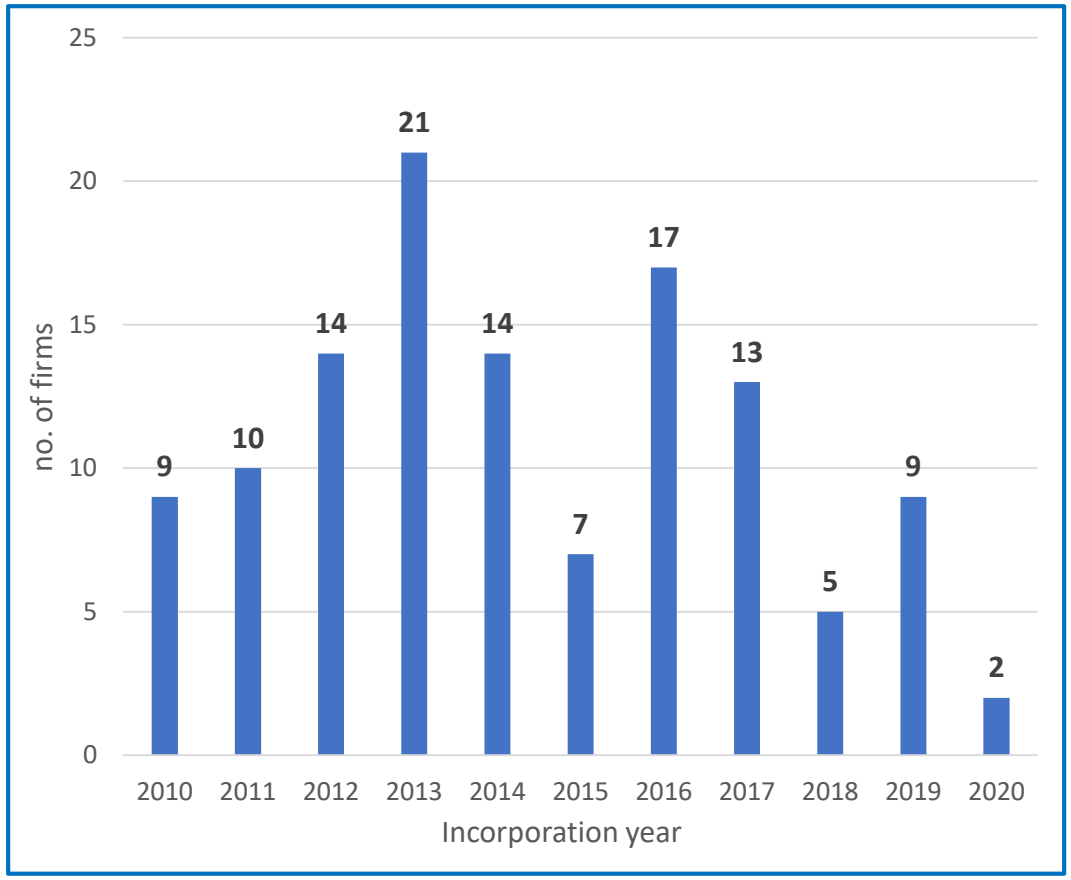
Most frequent partners: Mainly Universities and Research Centers

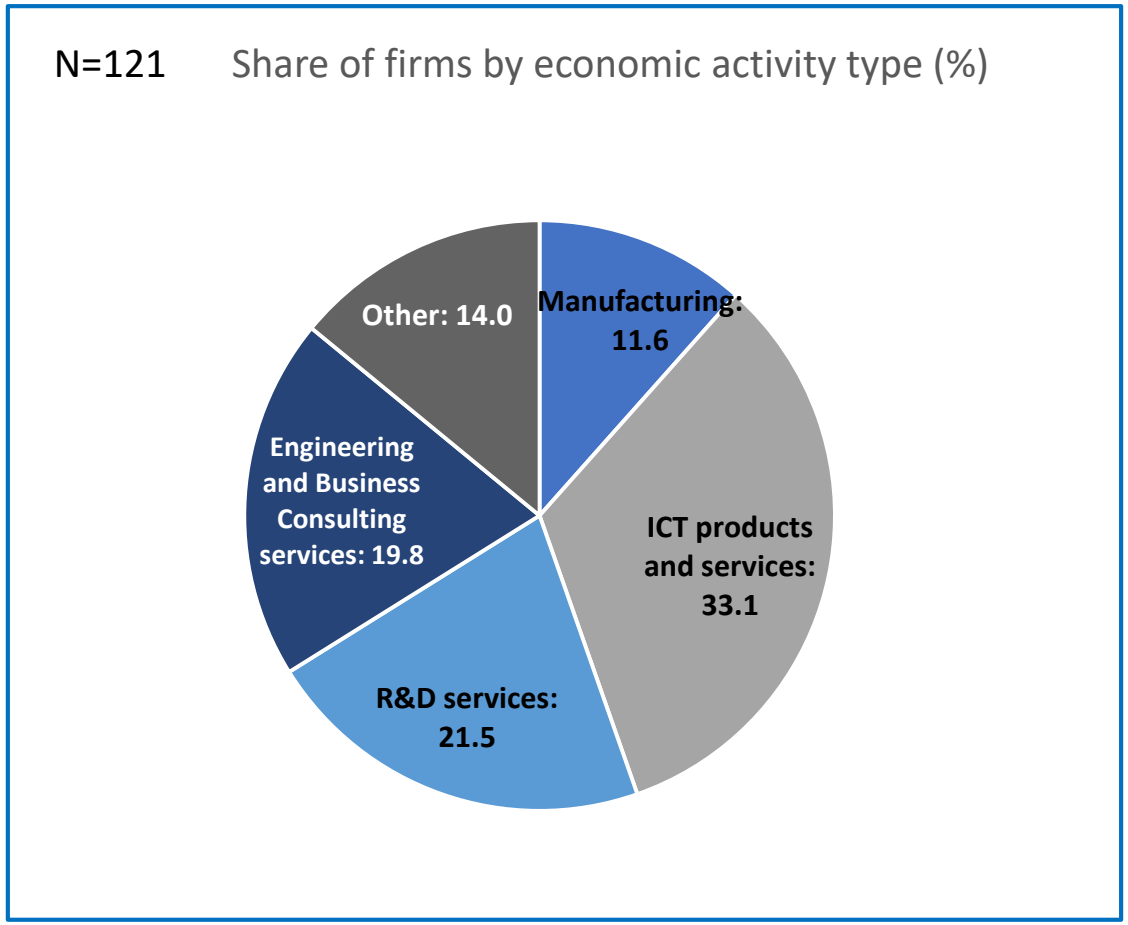
Name	Type	Centrality	Country
National Technical University of Athens	**University**	**Top 1%**	**GR**
Fraunhofer Institute	Research Centre	Top 1%	DE
National Centre for Research and Technological Development (CERTH)	**Research Centre**	**Top 1%**	**GR**
National Research Council	Research Centre	Top 1%	IT
Atos Spain SA	Firm	Top 1%	ES
National Centre for Scientific Research - CNRS	Research Centre	Top 1%	FR
Aristotle University of Thessaloniki	**University**	**Top 1%**	**GR**
Foundation for Research and Technology (FORTH)	**Research Centre**	**Top 1%**	**GR**
Technology Research Centre	Research Centre	Top 1%	FI
National Kapodistrian University of Athens	**University**	**Top 1%**	**GR**
Netherlands Organisation for Applied Scientific Research	Research Centre	Peripheral	NL
European Atomic Energy Commission	Research Centre	Top 1%	FR
Polytechnic University of Milan	University	Top 1%	IT
Atos It Solutions and Services Iberia Sl	Firm	Peripheral	ES
Interuniversity Microelectronics Center	Research Centre	Top 1%	BE
Polytechnic University of Madrid	University	Top 1%	ES
Fiat Research Centre SCPA	Research Centre	Top 1%	IT
University of Patras	**University**	**Top 1%**	**GR**
Telefonica Research and Development SA	Firm	Top 1%	ES
Netcompany-Intrasoft SA	Firm	Top 1%	LU

Concluding remarks (1)

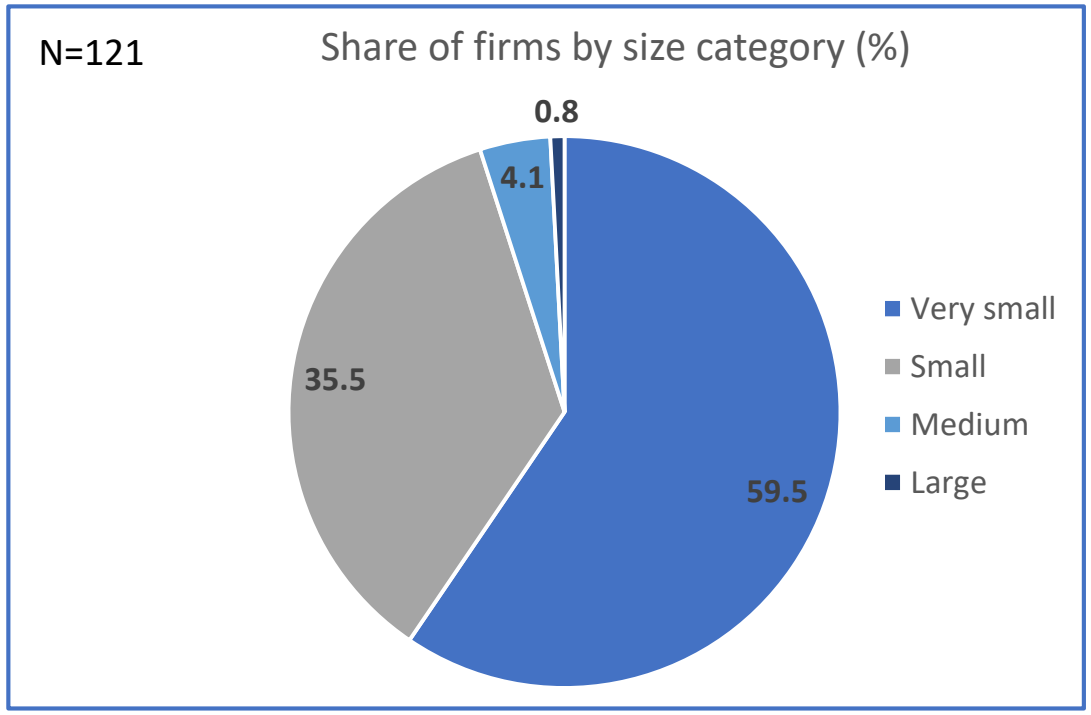
- Greek young firms are **embedded in highly interconnected networks**, having access to a large amount of technological knowledge and information held by other actors.
- They have the **potential to develop relationships** and thus **exchange technological knowledge and expertise with actors exhibiting a high degree of diversity** (in terms of type, sector, and centrality position).
- **Often get into the network** through their **connections with organizations holding very central network positions.** Connecting to a prestigious incumbent not only provides superior quality resources but also works as a signal to future collaborations.

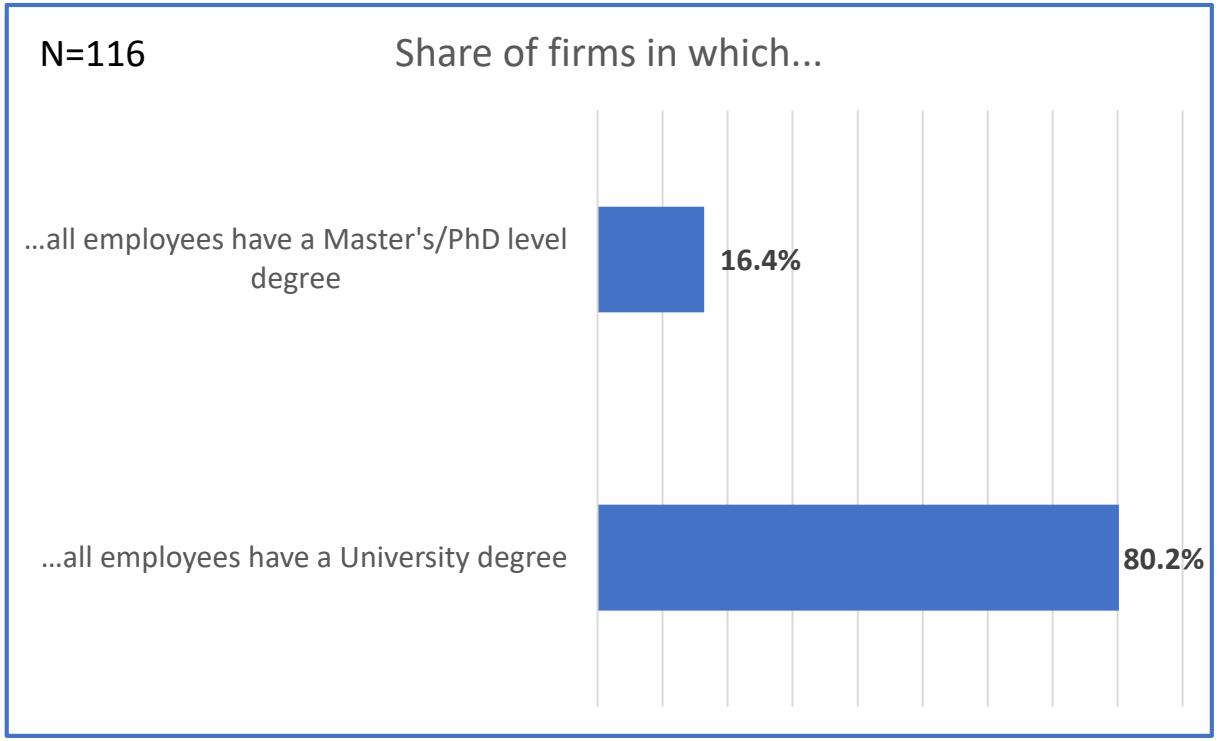
The sample: firms established from 2010 onwards with at least 1 participation in FP7 or H2020→ primarily knowledge-intensive services (74.4%)





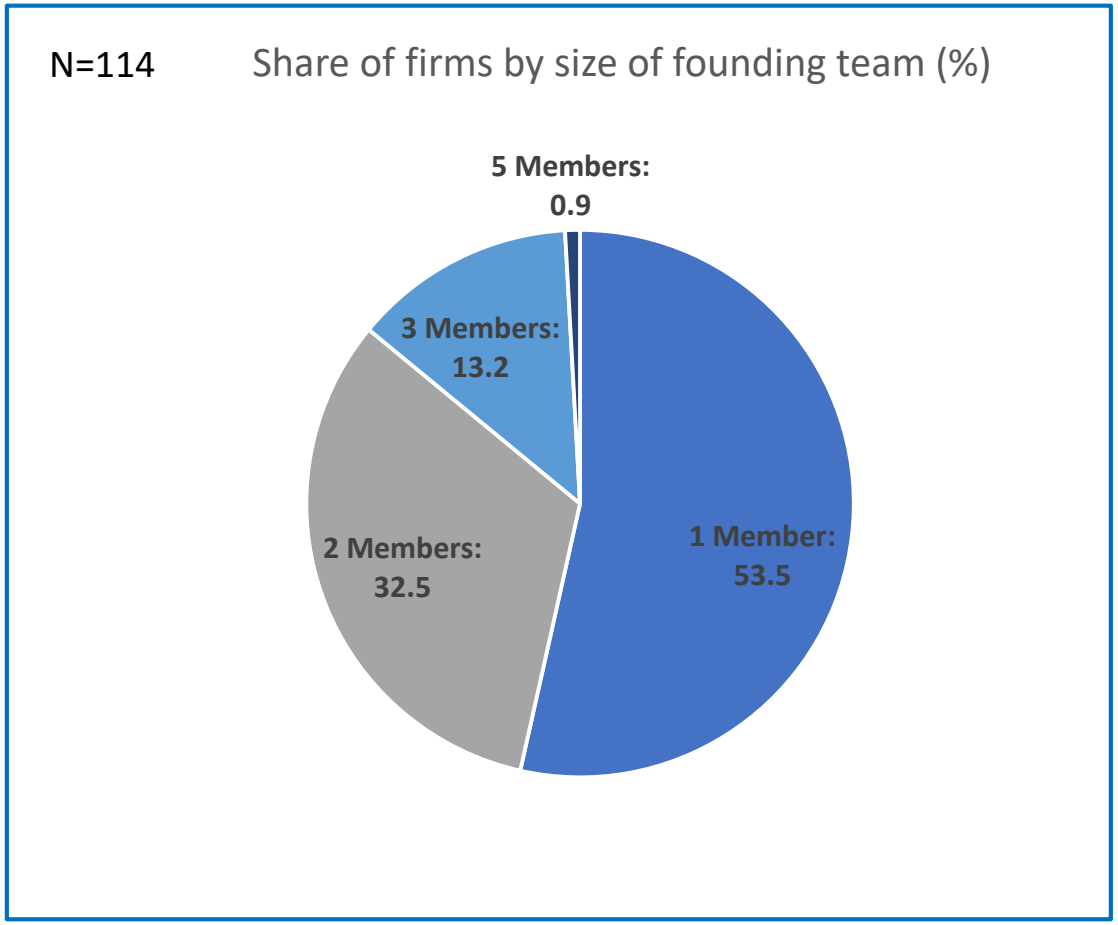
Sample characteristics: the large majority are micro and small firms (95%) with a very large share of well-educated employees

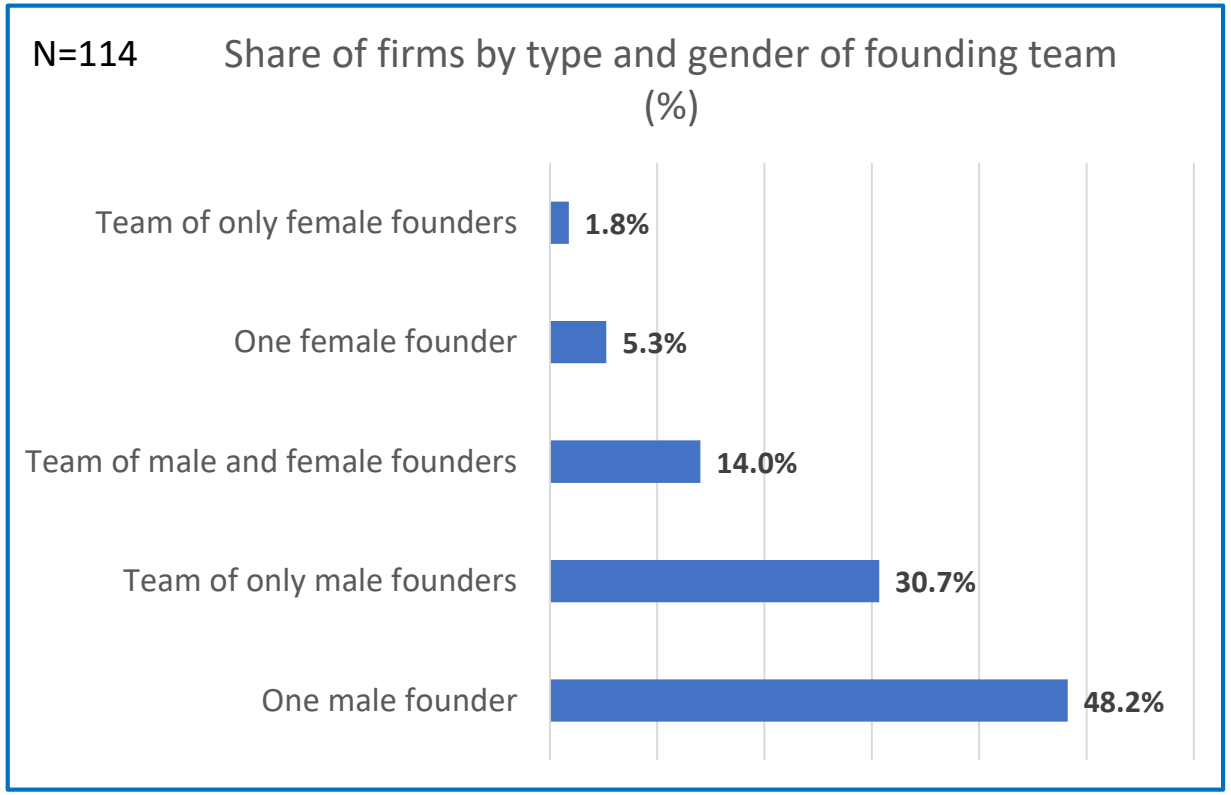




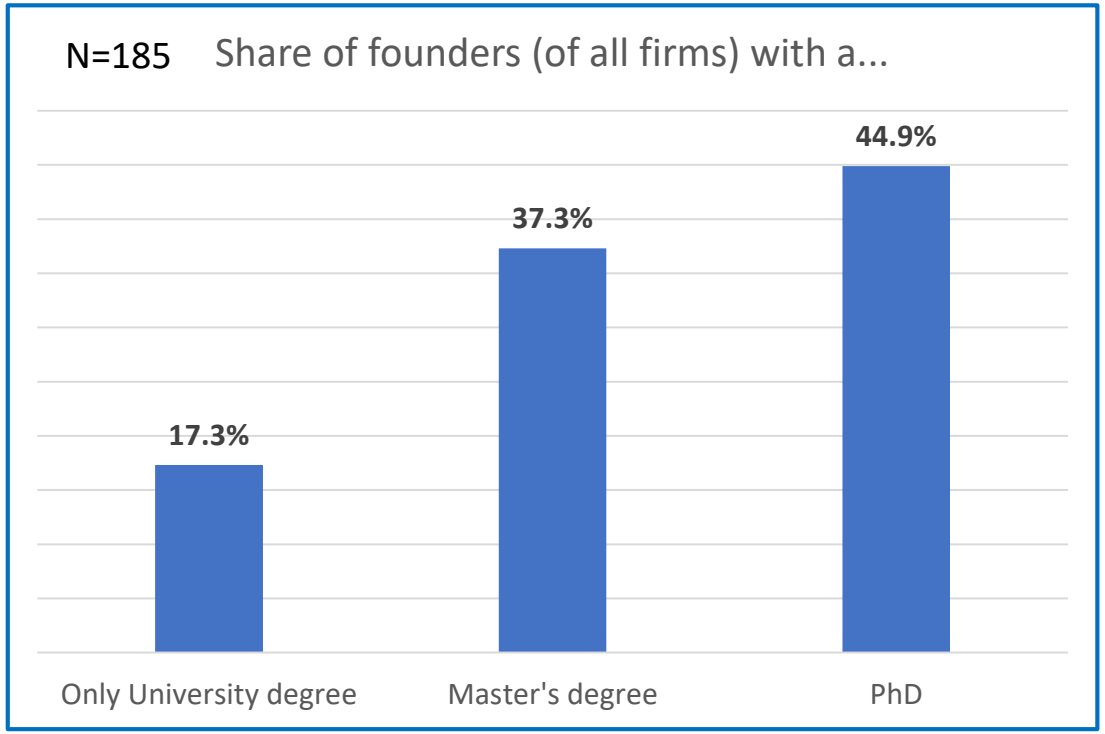
- **7.4% (9 firms) are spin-offs from Universities and Research Centres**

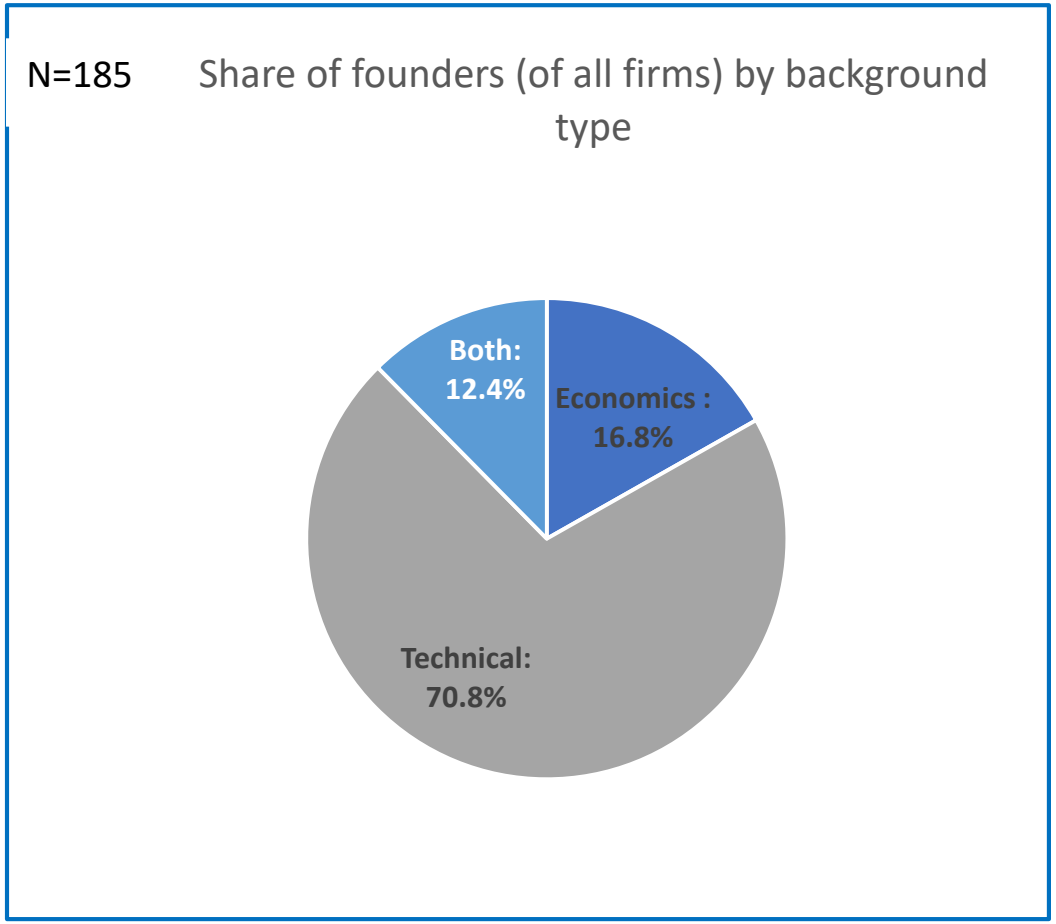
The founding team: small (86% up to 2 members), male-dominated teams



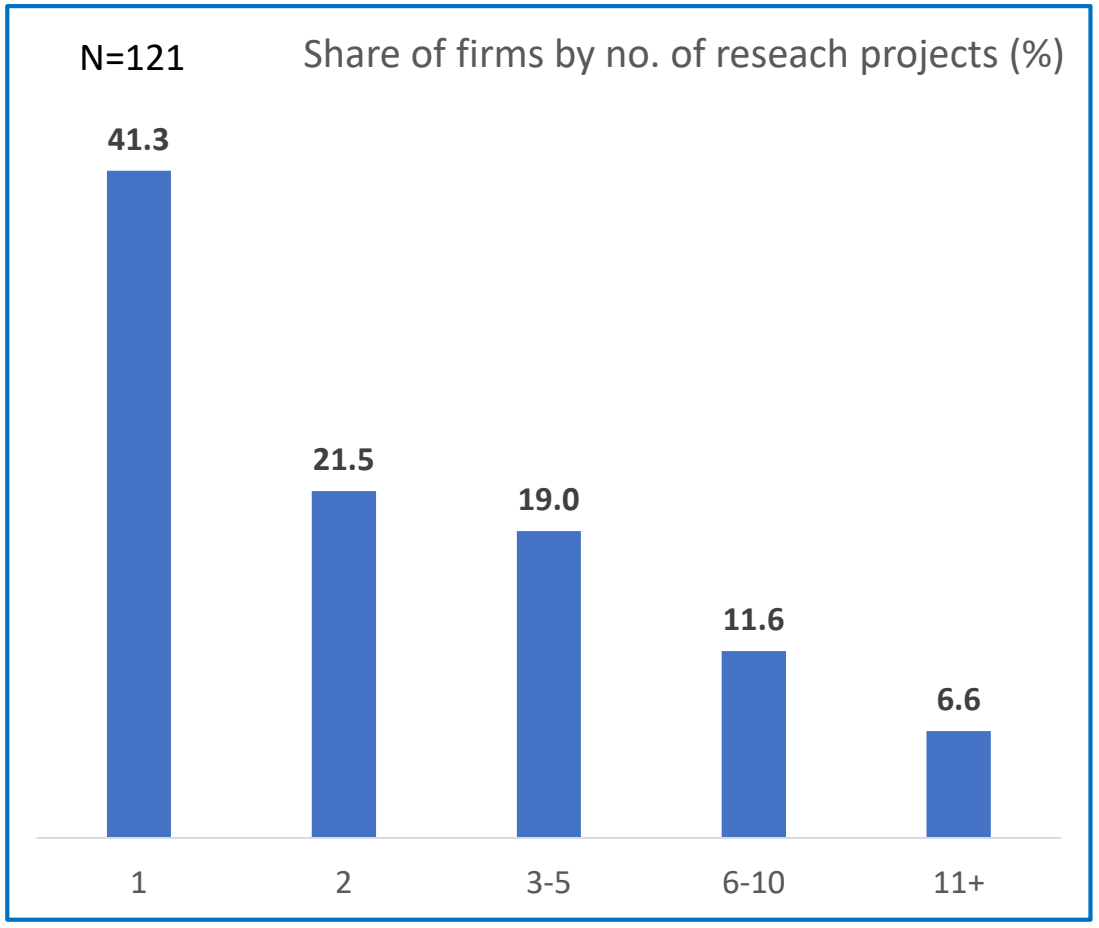


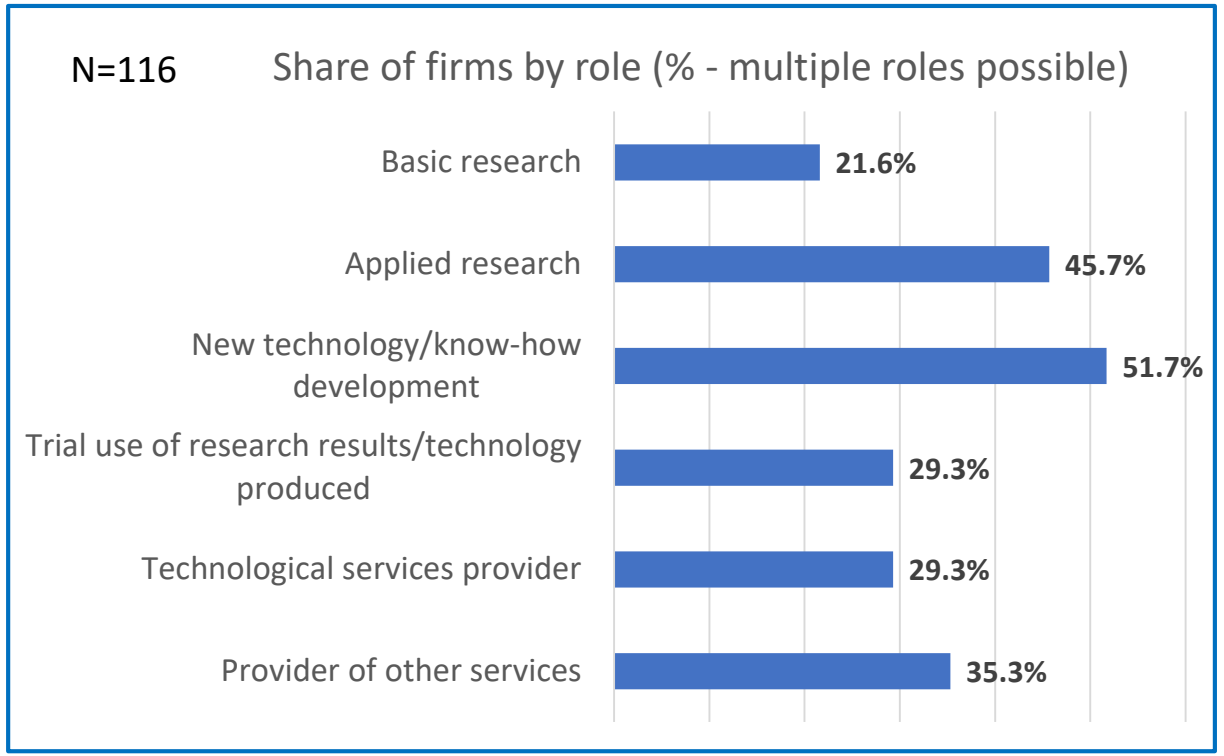
Very well-educated founding teams: all founders have a university degree, and almost 50% are Ph.D. holders, mostly with a technical expertise (71%)





Project participation and role: 63% have participated in just 2 projects, and more than 50% are new technology developers





- 15% (18 firms) have developed 1 or more innovations (48 in total) during their participation (Source: Innovation Radar)

Determinants of firms' participation in FPs

Variable	No of Projects	
	Model 1	Model 2
Control Variables		
Firm's Age	0.110	0.112
No of Employees (ln)	**0.692***	0.573
Human Resources		
No of Employees with PhD	**0.383*****	**0.421*****
Founding team		
No of Founders	-0.282	-0.288
Combination_Tech&Economy_Background	**1.774****	**1.626****
Project role		
No of different roles	**1.736*****	
Basic Research		0.551
Applied Research		**1.496***
New technology/know-how development		**1.860****
Trial use of research results/technology produced		**1.905****
Technological Services Provider		**1.979****
Provider of other services		**2.315*****
No. of Observations	110	110
F (Prob > F)	18.38***	10.21***
Adjusted R^2	0.489	0.482

***: p < 0.01 **: p < 0.05 *: p < 0.10

- **Employees' human capital** (educational background), and **heterogenous founding teams** (combining technical and managerial/finance background) are **important for achieving increased participation in FPs** along with **multiple project roles**, especially those reflecting significant **research and technological capabilities**.

Concluding remarks (2)

- Greek young firms participating in FPs are largely **knowledge-intensive**
- Their presence in FPs is **highly skewed** with a small proportion of them participating in more than 5 projects
- They can assume **multiple project roles** and their participation may be related to their research-intensive orientation.
- Their exact technological specialized knowledge and capabilities can make them **attractive partners** to network incumbents and therefore **facilitate their network entry**.

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

Participation Intensity & Firm Size

Participation Intensity	Size (% of firms)	
	Micro firms	Larger firms
1 project	74	26
2-3 projects	62.9	37.1
≥ 4 projects	36.1	63.9

Participation Intensity & Education of Employees

Participation Intensity	Average No. of Employees with a Master's/PhD level degree	Average No. of Employees with a PhD
1 project	7.08 (4)	1.73 (1)
2-3 projects	6.46 (3)	1.49 (1)
≥ 4 projects	9.89 (7.5)	3.31 (2)

Participation Intensity	Average No. of Employees with a Master's/PhD level degree	Average No. of Employees with a PhD
1 project	8.33 (5)	2.16 (2)
2-3 projects	7.69 (5)	2.23 (1)
≥ 4 projects	11.33 (8.5)	4.08 (3)

Participation Intensity & Basic Role in the project

Participation Intensity	Basic Role in the project (% of firms)					
	Basic Research	Applied Research	Developer of new technology	Prototyping/ testing of technology	Provider of technical services	Provider of other services
1 project	17	25.5	25.5	10.6	19.1	38.3
2-3 projects	17.1	42.9	60	20	17.1	25.7
≥ 4 projects	32.4	76.5	79.4	64.7	55.9	41.2

Innovation, Innovation Type & Firm Size

Size	Innovation (% of firms)	
	YES	NO
Micro firms	6.9	93.1
Larger firms	26.5	73.5
TOTAL	**14.9**	**85.1**

Innovation Type	% of firms with Innovation (N=18)
Exploring	66.7
Tech Ready	38.9
Business Ready	22.2
Market Ready	44.4

Innovation Type	Average No. of Innovations per firm (N = 18)
Exploring	1.11
Tech Ready	0.50
Business Ready	0.28
Market Ready	0.78

Statistics

		A18_ArithmosErgonMeKainotomia	A19.1_SynolikosArithmosKainotomionEpixeirisis
N	Valid	18	18
	Missing	0	0
Mean		1.83	2.67
Median		1.00	2.00
Minimum		1	1
Maximum		8	10

A18_ArithmosErgonMeKainotomia

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	12	66.7	66.7	66.7
	2	3	16.7	16.7	83.3
	3	1	5.6	5.6	88.9
	4	1	5.6	5.6	94.4
	8	1	5.6	5.6	100.0
	Total	18	100.0	100.0	

A19.1_SynolikosArithmosKainotomionEpixeirisis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	7	38.9	38.9	38.9
	2	5	27.8	27.8	66.7
	3	2	11.1	11.1	77.8
	4	2	11.1	11.1	88.9
	7	1	5.6	5.6	94.4
	10	1	5.6	5.6	100.0
	Total	18	100.0	100.0	

Innovation & Basic Role in the project

Innovation	Basic Role in the project (% of firms)					
	Basic Research	Applied Research	Developer of new technology	Prototyping/ testing of technology	Provider of technical services	Provider of other services
YES	27.8	66.7	66.7	61.1	38.9	22.2
NO	20.4	41.8	49	23.5	27.6	37.8

Participation Intensity & Innovation

Participation Intensity	Innovation (% of firms)	
	YES	NO
1 project	4	96
2-3 projects	14.3	85.7
≥ 4 projects	30.6	69.4