

Ο ρόλος των χρηματοδοτούμενων δικτύων έρευνας και καινοτομίας από
τα ευρωπαϊκά
ερευνητικά προγράμματα στην προώθηση της επιχειρηματικότητας
έντασης γνώσης

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EU-funded research projects as a networking environment for young firms (1)

Several studies have examined the structural features of the research collaborative networks funded by the EU FPs (e.g., Breschi and Cusmano, 2004; Barber et al. 2006; Roediger-Schluga and Barber 2008; Protogerou et al. 2010; Protogerou et al. 2012).

Summary of research findings

- EU-funded research activity has grown considerably resulting in substantially large networks
- Networks' connectivity is highly dependent on a core of influential actors (mainly universities, research centers, and large-sized firms) strengthening their positioning and strategic role through time.
- Newcomers (such as small firms) get access to FPs often through joining projects led by larger and more reputed organizations. Thus, although basic networks remain stable, they are also able to attract new partners over time.
- The networks analyzed display 'small-world properties' i.e., they may be considered as relatively efficient mechanisms of knowledge creation and diffusion.

EU-funded research projects as a networking environment for young firms (2)

Empirical evidence indicates that, in general, there is a downward trend in industrial participation in FPs over time (Protogerou et al., 2012), due to contract conditions on intellectual property rights administrative complexities, and bureaucracy.

The presence of dynamic SMEs is generally limited and only a limited number of them acquire equally important network positions to their larger, well-established counterparts (Protogerou et al., 2013).

Barriers to participation (Faber et al., 2016) may be related to

- the cognitive distance between EU research projects and SME practices,
- the social distance between SMEs and potential attractive network partners,
- participation costs, and
- complexity and duration of EU application procedures.

EU-funded research projects as a networking environment for young firms (3)

In general, empirical evidence on the impact of FPs on industrial partners indicates that their main contribution lies in the improvement of firms' scientific and technological capabilities and not directly in their economic performance.

Thus, there is a need this study indicates the need to capture the economic value of intangible assets (e.g., innovative and technological capabilities) produced through FPs which in turn affect firms' economic performance and entrepreneurial outcomes.

Methodology

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 Horizon2020).

The database includes information on:

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

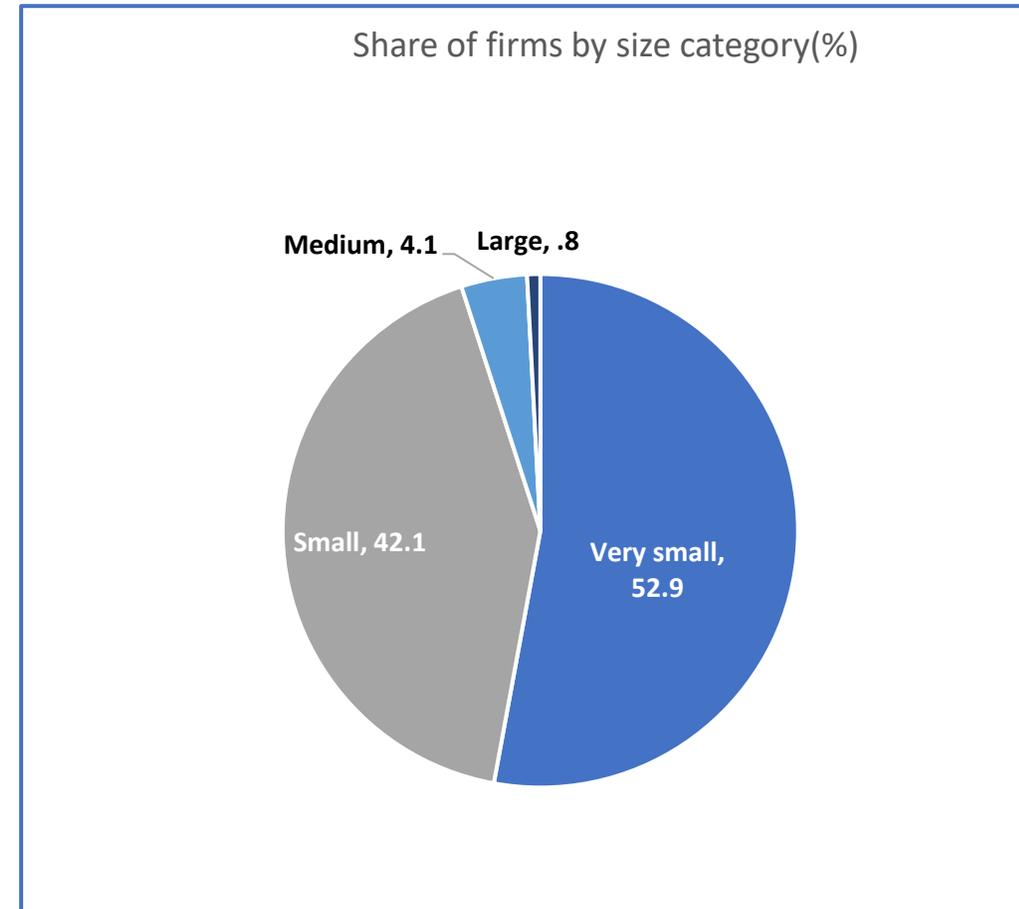
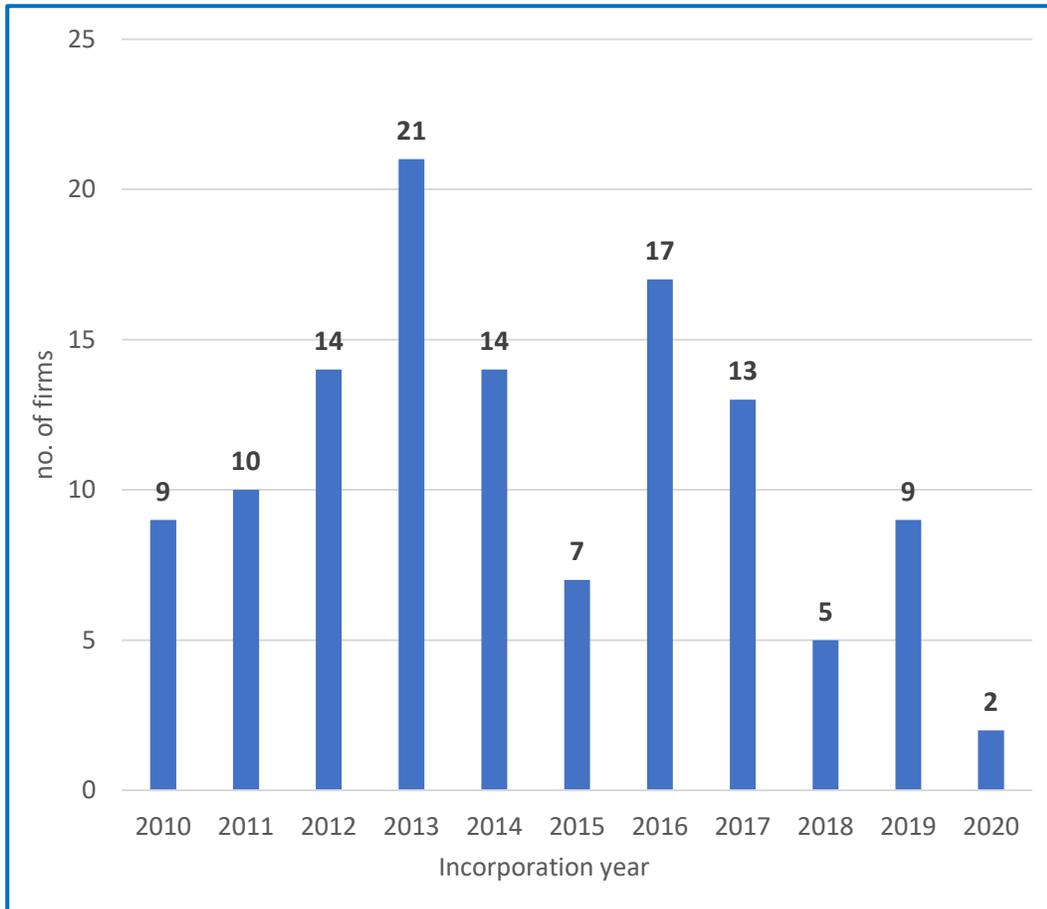
Social network analysis to describe the structural characteristics and study the network position and role of newly-established firms in FP7 and H2020) and to investigate the collaboration patterns developed among them and other network research actors (ego networks).

In this way, we are examining the potential of the specific networking environment to allow newly-established participating firms:

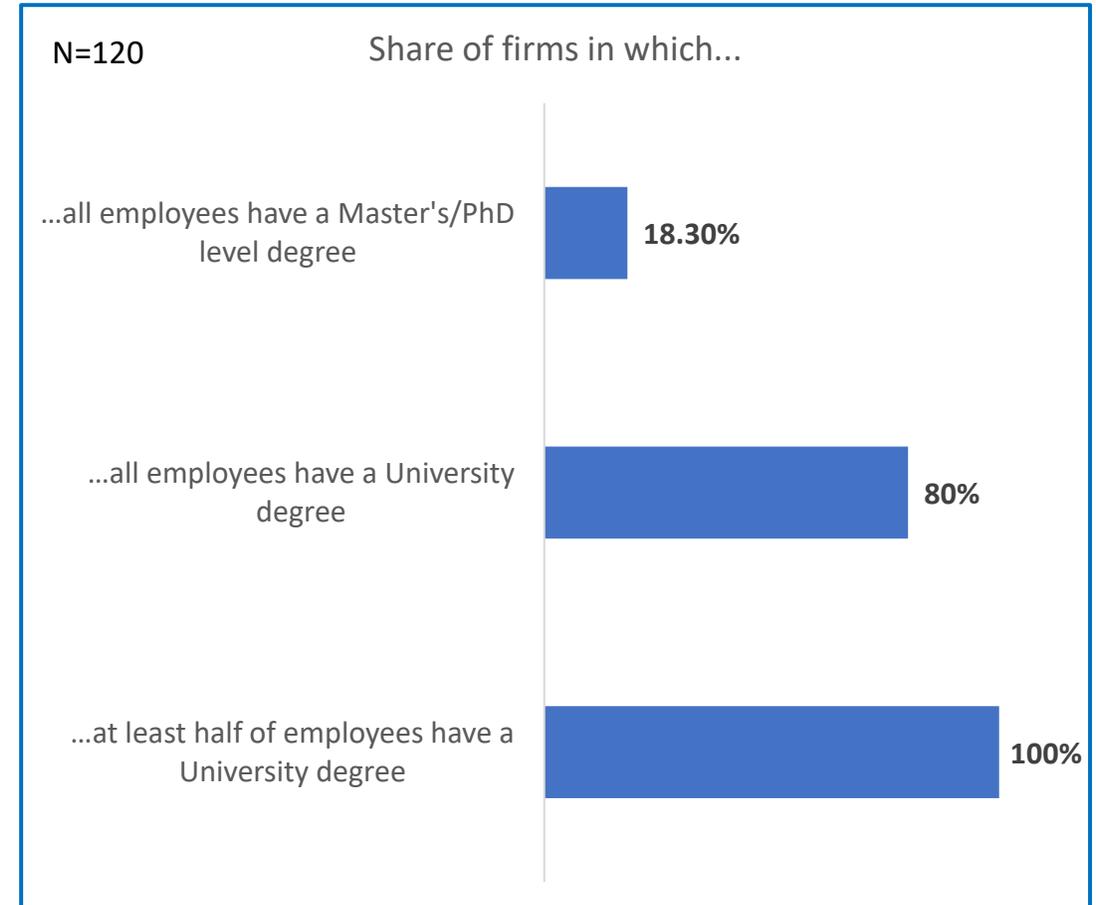
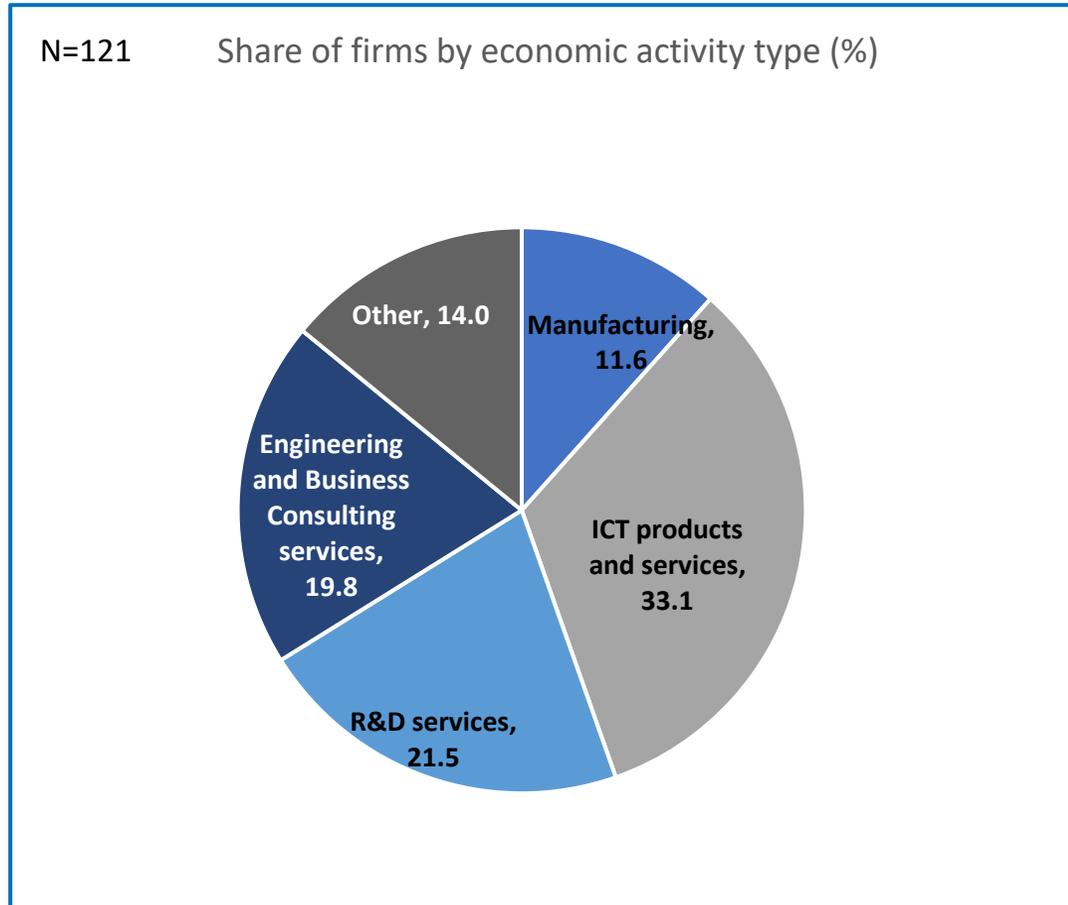
- a) to gain access to a considerable amount of resources
- b) to develop relationships with actors exhibiting a high degree of diversity

Sample and descriptives

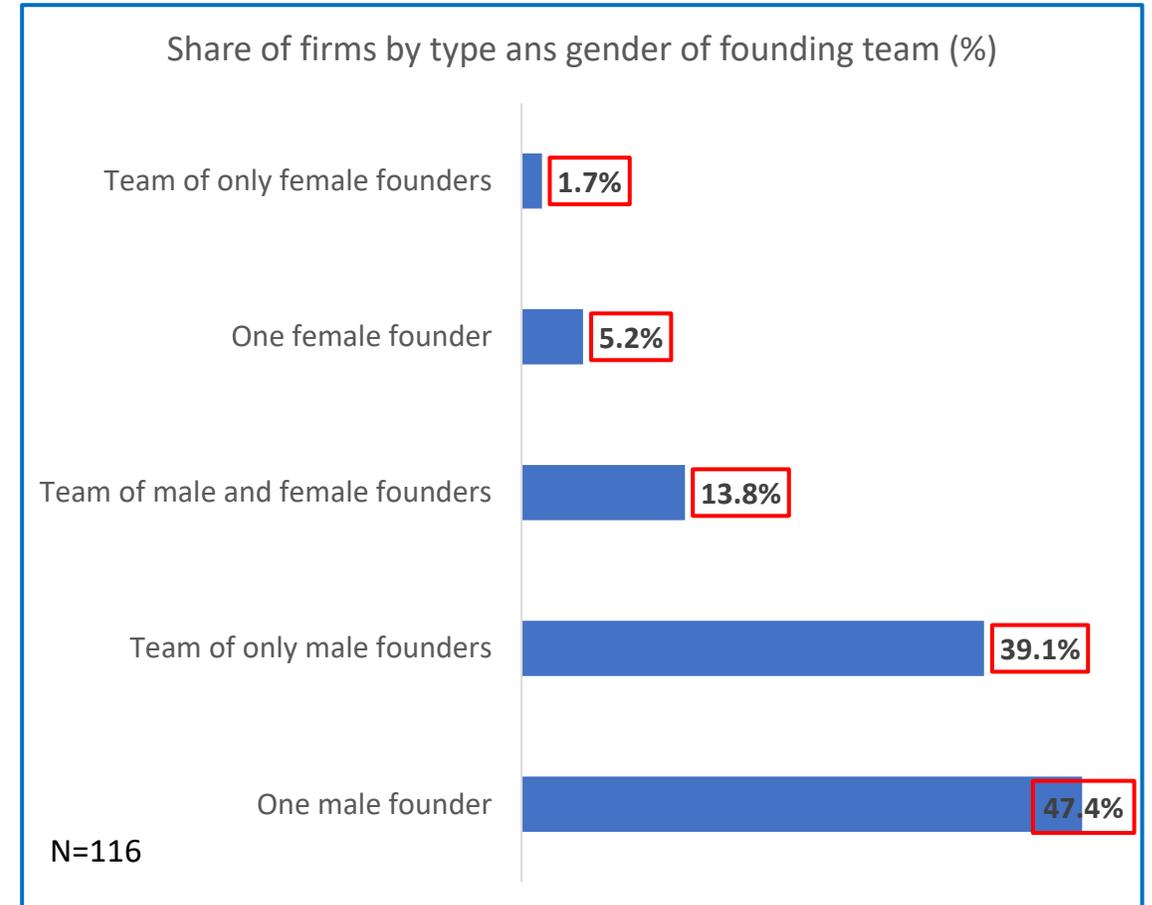
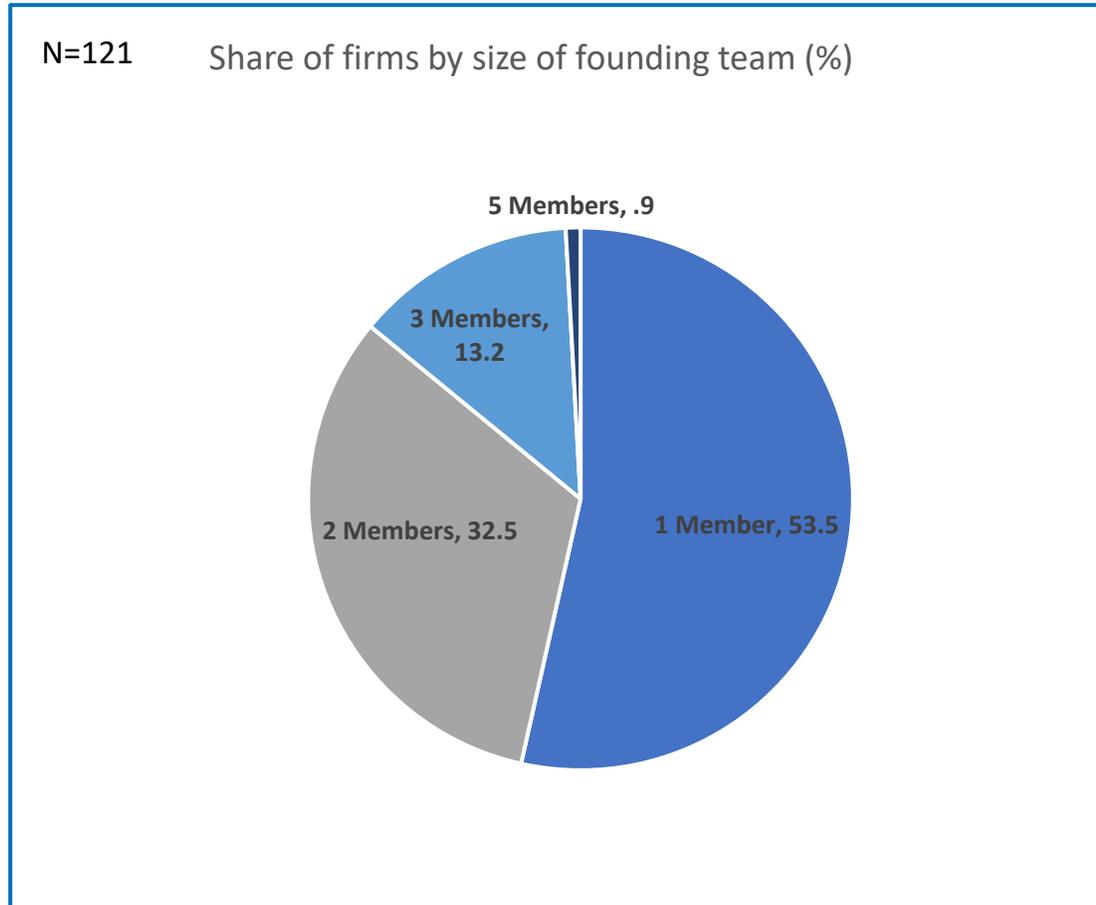
The sample: firms established from 2010 onwards with at least 1 participation in FP7 or H2020 → in their majority micro and small firms (N=121)



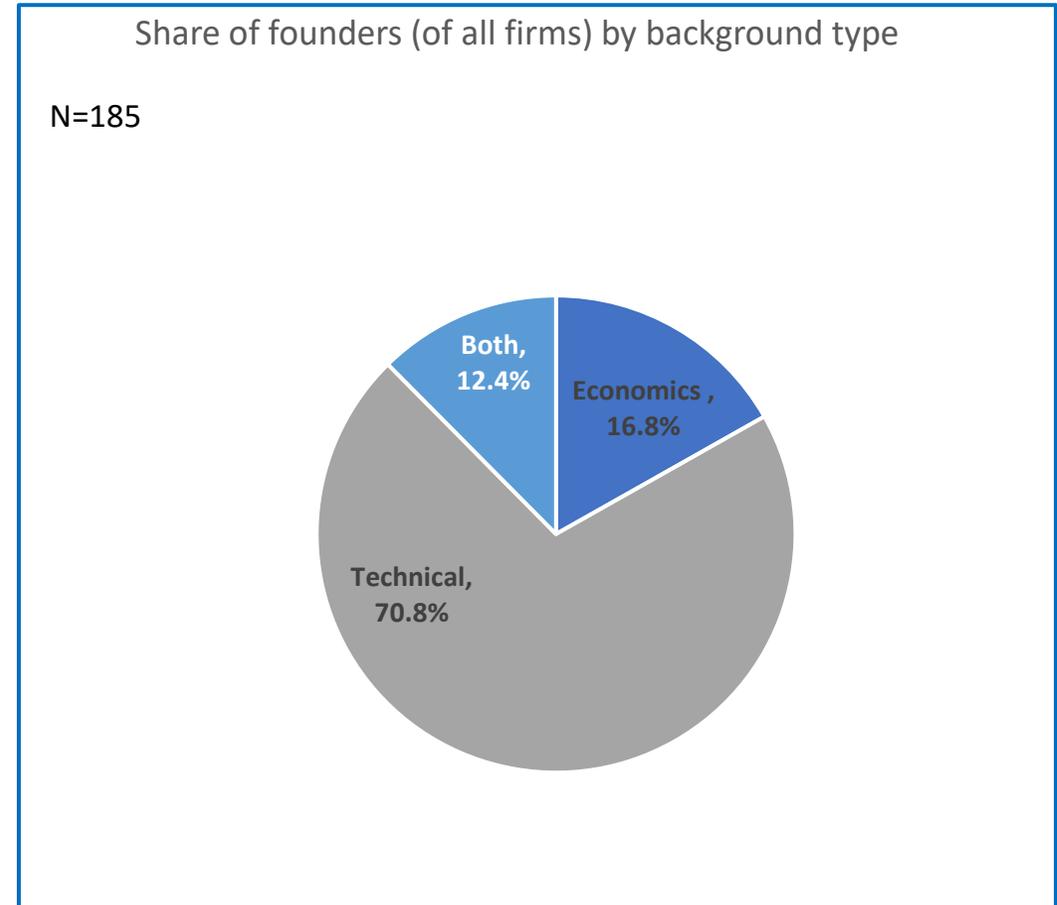
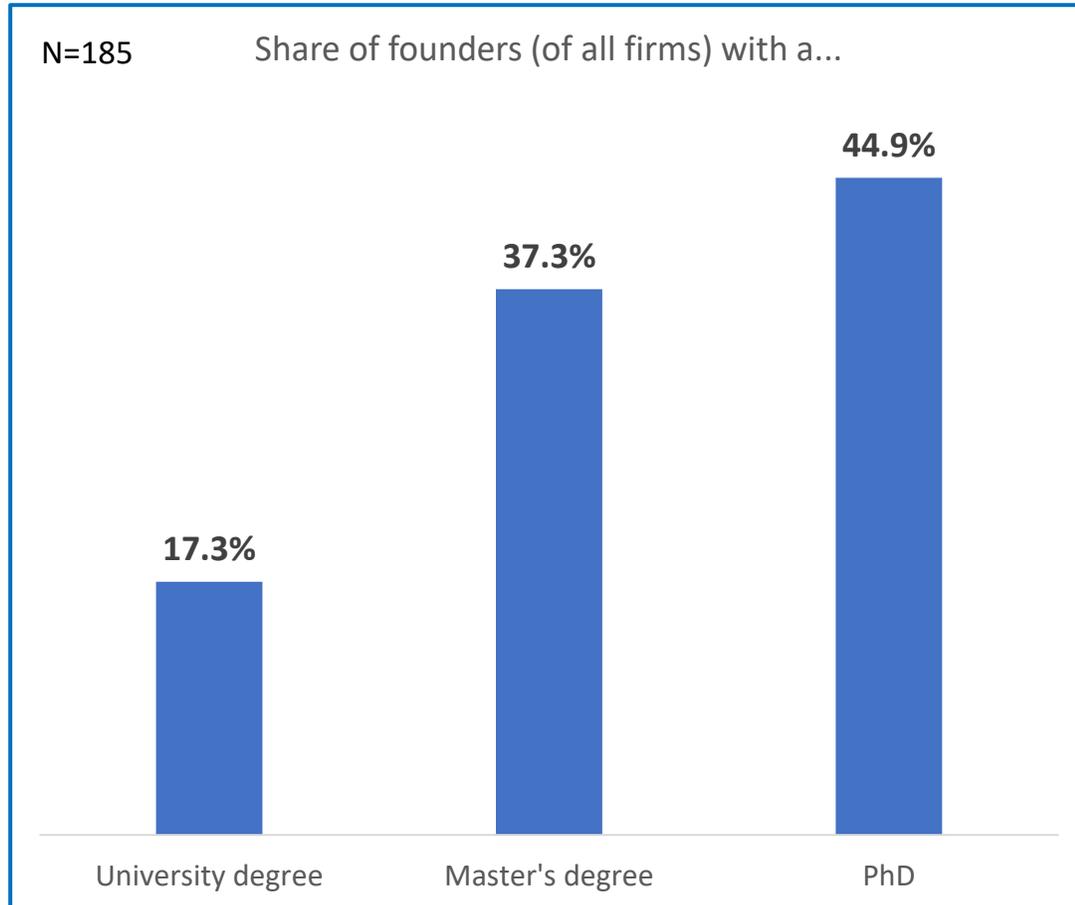
Sample characteristics: primarily knowledge-intensive services (74.4%) with a large share of well-educated employees



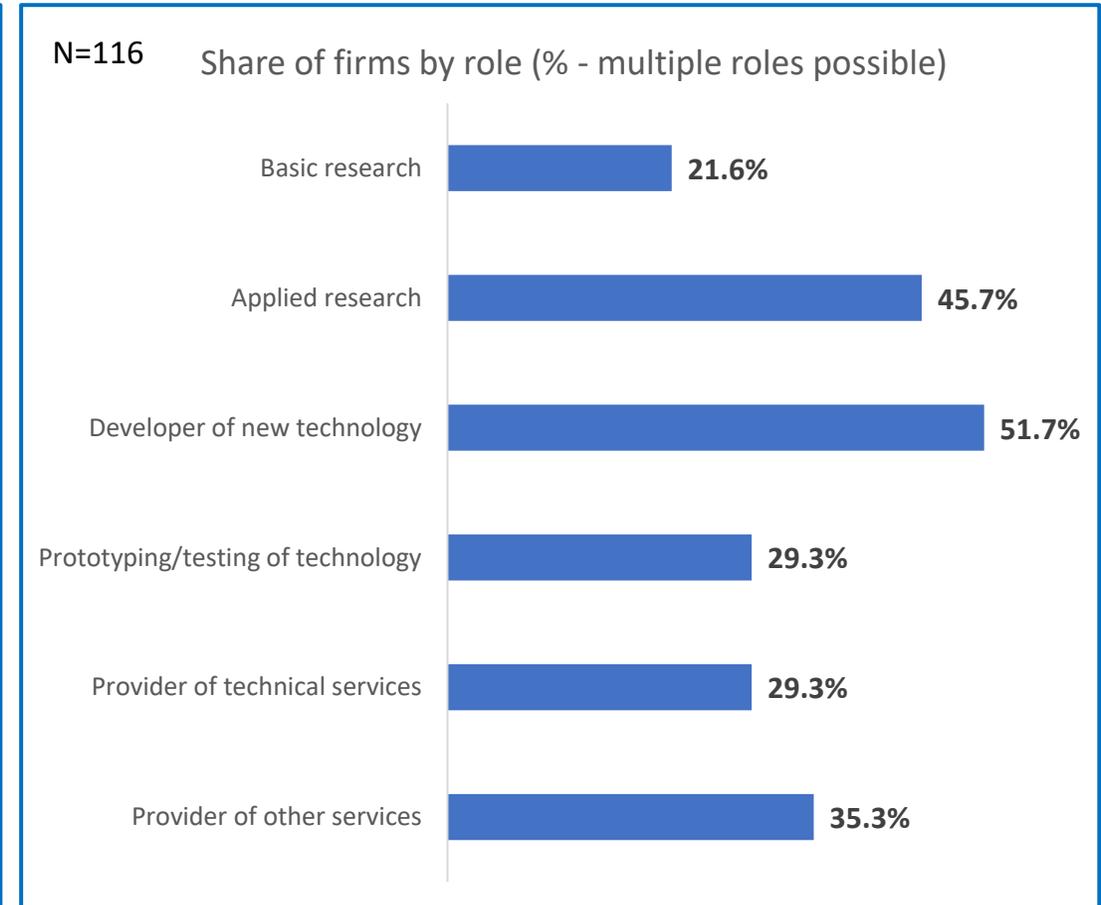
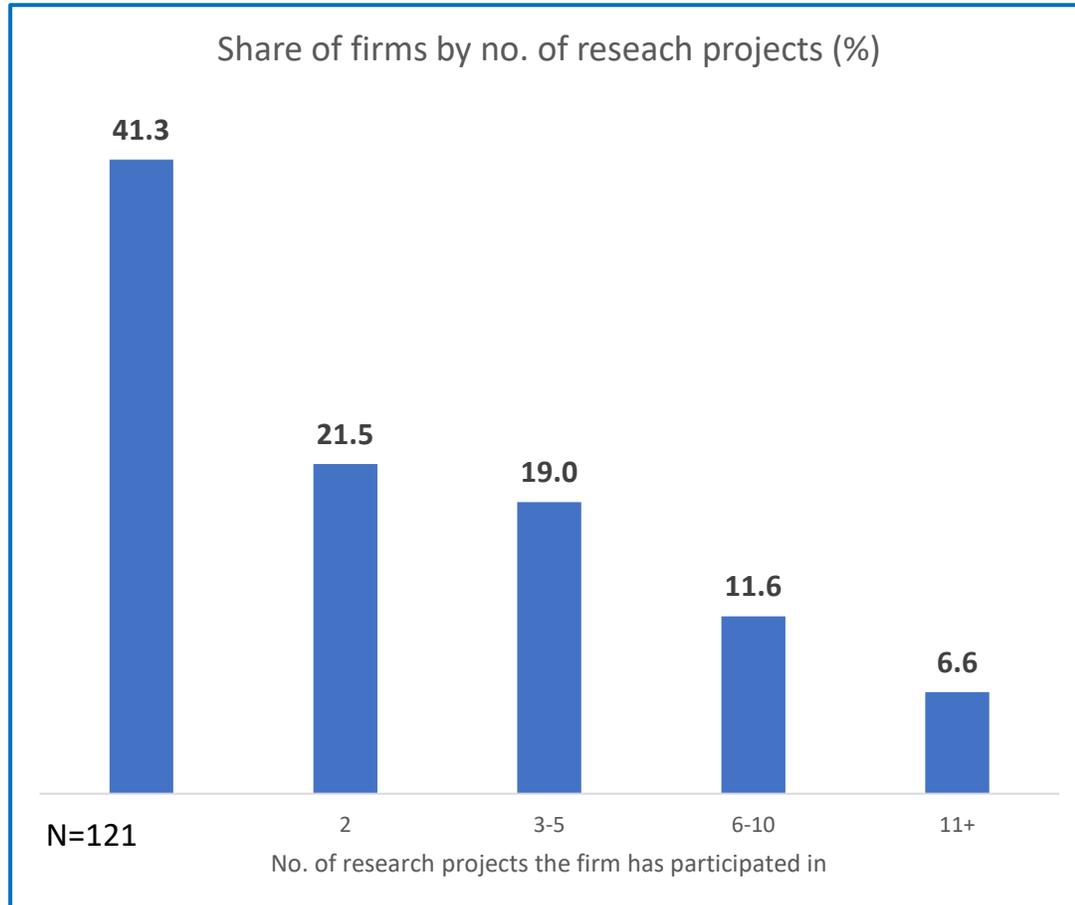
The founding team: small (86% up to 2 members), male-dominated teams



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



Concluding remarks (1)

- 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.

Regression results

Determinants of firms' participation in FPs (linear regression models)

Variable	No of Projects		Ln (Total Funding)	
	Model 1	Model 2	Model 3	Model 4
Control Variables				
Firm's Age	0.140	0.162	0.056	0.045
No of Employees (ln)	0.377	0.284	0.069	0.118
Sector_Manufacturing	1.033	0.873	0.952**	0.629
Sector_ICT products & services	0.569	0.489	0.814**	0.596*
Sector_R&D services	-1.009	-1.231	0.668*	0.395
Sector_Engineering & Business Consultant services	0.126	0.565	0.530	0.655*
Human Resources				
No of Employees with PhD	0.502***	0.567***	0.074*	0.072*
Founding team				
No of Founders	-0.466	-0.479	-0.103	-0.109
Combination_Male&Female	0.704	0.721	0.090	0.163
Average_EduLevel	-0.198	-0.153	-0.140	0.084
Combination_Tech&Economy_Background	1.801**	1.666*	0.306	0.253
Project role				
No of different roles	1.661***		0.384***	
Role_Basic Research		0.666		-0.011
Role_Applied Research		1.169		0.571**
Role_Technology Development		1.378		0.694***
Role_Technology Services Provider		2.072**		0.345
Role_Trial Use of Research Results		2.056**		0.377
No. of Observations	110	110	104	104
F	9.36	6.13	6.98	6.06
Prob > F	0.000	0.000	0.000	0.000
R ²	0.5365	0.5131	0.4793	0.5271
Adjusted R ²	0.4792	0.4293	0.4107	0.4401

Determinants of firm's innovation intensity as measured by Innovation Radar (Tobit regression models)

Variable	Model 1	Model 2
Control Variables		
Firm's Age	0.319	0.398*
No of Employees (ln)	2.152**	1.822**
Sector_ICT products & services	1.270	1.651
Sector_R&D services	3.085	3.271
Sector_Engineering & Business Consultant services	-1.681	-1.830
Sector_Other	2.036	2.200
Human Resources		
No of Employees with PhD	-0.262	-0.270
Founding team		
No of Founders	0.553	0.345
Combination_Male&Female	-0.281	-0.598
Average_EduLevel	1.283	1.389
Combination_Tech&Economy_Background	0.046	0.519
FPs Participation Characteristics		
Ln_Total Funding	1.898***	1.654**
Role_Range	0.105	
Role_Research		0.187
Role_Technology Development/Services		-1.915
Role_Trial Use of Research Results		2.740**
No. of Observations	104	104
Log likelihood	-60.65	-57.77
LR(χ^2)	38.94***	44.70***
Pseudo R ²	0.2430	0.2789

Concluding remarks (2)

- 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.
- Previous participation in FPs, firm size and their project role as technology developers are important drivers of innovation intensity

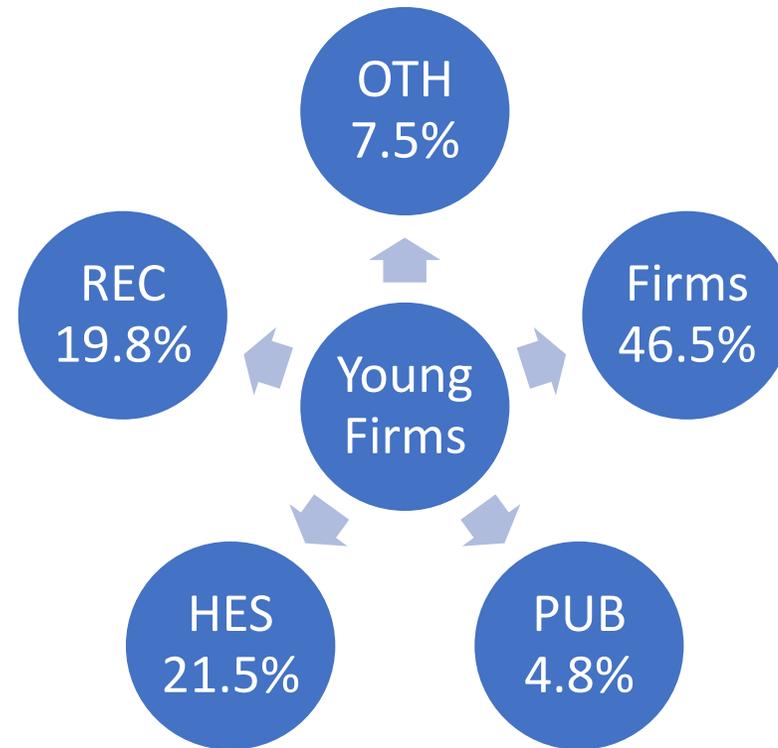
Social network analysis

Network structural characteristics: highly interconnected networks

	FP 7	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)



REC: research center, HES: university, Firms, PUB: public bodies, OTH: other actors

Most frequent partners → Largely central universities and research centres

Name	Type	Centrality	Country	Total links
National Technical University of Athens	HES	Top 1%	GR	76
Fraunhofer Institute	REC	Top 1%	DE	73
National Centre for Research and Technological Development (EKETA)	REC	Top 1%	GR	56
National Research Council	REC	Top 1%	IT	35
Atos Spain Sa	FIRM	Top 1%	ES	31
National Centre for Scientific Research - CNRS	REC	Top 1%	FR	30
Aristotle University of Thessaloniki	HES	Top 1%	GR	28
Foundation for Research and Technology (ITE)	REC	Top 1%	GR	26
Technology Research Centre	REC	Top 1%	FI	26
National Kapodistrian University of Athens	HES	Top 1%	GR	24
Netherlands Organisation for Applied Scientific Research	REC	Peripheral	NL	23
European Atomic Energy Commission	REC	Top 1%	FR	23
Polytechnic University of Milan	HES	Top 1%	IT	23
Atos It Solutions and Services Iberia SI	FIRM	Peripheral	ES	23
Interuniversity Microelectronics Center	REC	Top 1%	BE	22
Polytechnic University of Madrid	HES	Top 1%	ES	21
Fiat Research Centre SCPA	REC	Top 1%	IT	20
University of Patras	HES	Top 1%	GR	20
Telefonica Research and Development SA	FIRM	Top 1%	ES	19
Netcompany-Intrasoft SA	FIRM	Top 1%	LU	18
Agricultural University of Athens	HES	Top 1%	GR	18
Polytechnic University of Turin	HES	Top 1%	IT	17
University Of Surrey	HES	Top 1%	UK	17
Engineering - Ingegneria Informatica SPA	FIRM	Top 1%	IT	17

Concluding remarks (3)

- 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.

Thank you for your attention!