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Title

The participation of new technology-based firms in EU R&D projects: an empirical analysis

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Abstract

This paper investigates the firm characteristics affecting the likelihood for a high-tech start-up to participate and coordinate EU funded R&D collaborative projects and the characteristics of these latters. We focus on a sample composed of 8346 European New Technology-Based Firms (NTBFs) from six European countries observed between 1995 and 2008. Out of these firms, 643 participated in one or more EU funded projects (1398 projects in total, 161 of which with a NTBF acting as project coordinator). The statistical and econometric analyses show that previous experience in EU projects and Venture Capital support has a strong impact on participation. Conditional on participation, the main determinant of coordination propensity is the specific experience in coordinating a EU project, but not the experience as participant. We find also that the projects coordinated by a NTBF are substantially different from the ones where a NTBF is a simple participant: in particular they are smaller in the number of participants, countries represented and total EU funding.

Keywords

NTBFs, EU projects, start-ups, SMEs, EU research and innovation policy, Framework Programmes, research consortia.

Note

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1. Introduction

Ensuring an active involvement of SMEs, and in particular high-tech start-ups, in EU R&D collaborative projects has been repeatedly declared as a top-priority objective by the European Commission (Small Business Act for Europe, European Commission, 2008). The EU research and innovation policy is increasingly relying on collaborative projects to foster knowledge exchanges, sharing and re-combination between academic and industrial partners in order to overcome its "innovation gap", consisting in the poor exploitation of knowledge and research results into economic activity and jobs in the EU, compared to key competitors, Japan and the US in particular (Commission's mid-term review of the Lisbon Process, 2005). The annual budgets allocated since 1984 to the EU RTD Framework Programmes (FPs), the main programme for funding R&D collaboration (Eurostat, 2011), have been constantly growing, doubling nearly every 10 years. In the 7th EU RTD Framework Programme (2007-2013) only, 32 billion euros (equal to 60% of its budget) have been allocated to the Cooperation Programme, under which R&D projects are being funded. Also in view of the future Horizon 2020 and Cosme Programmes, the most relevant budget increase will concern initiatives aimed at favoring the participation of (young) innovative firms (EC press release IP/11/1475, dated 30/11/2011). More in general, R&D project-based models of cooperation have emerged as key instruments to support innovation systems competitiveness (Georghiou and Roessner, 2000).

The recent growth in the number of R&D collaborative projects is linked with some significant changes undergoing in innovation systems, such as the increasing need for complex and multidisciplinary skills required to any firm to develop innovation (Laredo, 1998), resulting in the rise of the open innovation paradigm (Chesbrough, 2003).

R&D collaborative projects can provide participants an access to partners' technological competencies, knowledge of the relevant markets, and complementary assets that are useful for the further development and successful commercialization of their technological artifacts. Moreover, they may also act as bridging ties (McEvily and Zaheer, 1999), allowing participants to take advantage of partners' business contacts to establish business relations with third parties not otherwise accessible. Last but not least, EU R&D funded projects provide financial resources otherwise difficult to obtain due to imperfections in the capital market. Hence, these projects may be crucial especially for New Technology-Based Firms (henceforth NTBFs) in order to allow them to fill competence and resource gaps they suffer for in the early stages of their existence (Pisano, 1991; Einsenhardt and Schoonhoven, 1996; Gans and Stern, 2003; Colombo and Piva, 2005).

Notwithstanding these policy schemes, especially those targeting NTBFs, are a hot issue in the policy makers agenda, they are a rather neglected topic in academic literature. Most of the studies looking at them, mainly focus on their structure and organization (e.g. Breschi and Cusmano, 2004), thus focusing at the project level and using a social network lens. Others scholars attempted to assess the impact of R&D collaborative projects on performances both at the project (Tijssen, 1998; De Fazio et al., 2009) and participant level (e.g. Benfratello and Sembenelli, 2002, Colombo et al., 2009). Quite surprisingly, the participation of firms is an understudied issue, although the comprehension of participation mechanisms is crucial from both a policy point and academic (i.e. policy evaluation) point of view. For what concerns the former, the design of targeted interventions has to take into account the obstacles (and potential solutions) faced by the recipient of these interventions (i.e. project partners). As to the latters, a policy evaluation exercise on EU funded R&D projects cannot leave aside the selection of participants into the treatment (i.e. project assignment). To our knowledge only few studies (e.g. Hernan, Marin and Siotis 2003; Siune, Schmidt and Aagard 2006; Marin and Siotis 2008; Paier and Scherngell, 2011) looked at the characteristics of the firms participating in R&D projects, but most of these studies used samples composed of participating firms only. Only Barajas and Huergo (2007) perform an analysis of participation on a sample of Spanish companies including non-participating firms as control group.

This paper aim at contributing to the existing literature in several ways. First of all, conversely to most of the literature, we specifically focus on NTBFs and not on big incumbent firms and at the industry structure they operate in. The determinants of participation by a NTBF, and especially the challenges, are likely to be completely different to those of incumbent.

Second, we do not restrict our analysis to the mere participation but we take a look also at the probability that a NTBF acts as coordinator of the project. Taking the lead of a EU collaborative project provides some advantages in terms of visibility and prestige (and possibly also monetary), however there are also challenges, e.g. the coordination of the participants' tasks, that are likely to be particularly difficult for NTBFs to face. Thus, we move a first step by analyzing both the characteristics of the NTBFs acting as coordinator and the features of the projects they take the lead of.

Third, thanks to peculiarities of the dataset, we are able to tackle an issue completely forgotten by the existing literature: the role of Venture Capital investors and how they affect the participating behavior of portfolio firms. We also take into account that VC investors are highly heterogeneous in terms of objectives and behavior, and we categorize them according to their different organizational structure (Da Rin et al., 2011).

We use a large sample of firms, more specifically NTBFs, from 7 European countries including both participating and non-participating firms and analyzing the probability that a NTBF participates (and eventually coordinates) a EU funded R&D project. More precisely, we investigate: i) the characteristics of the NTBFs participating in EU-funded projects (with comparison to the NTBFs that do not participate); ii) the characteristics of firms acting as coordinators of the project (given participation). In other words, our aim is to study the potential obstacles that inhibit NTBFs' access to this EU funding scheme (e.g. application costs), the potential remedies (e.g. Venture Capital support) and the peculiar characteristics of the projects they participate to.

The paper is divided as follows. Section 2 describes the sample of NTBFs, Section 3 presents the results of the statistical and econometric analyses. Finally, the concluding Section discusses both the academic contribution to the literature and the policy implications.

2. The sample

The sample of NTBFs participating in EU funded R&D projects used for our analyses originates from the merge of two data sources: VICO and CORDIS databases. The former is a database developed within the EU project named VICO containing accounting, investment and performance data on European New Technology-Based Firms. The latter is a database containing information about all the projects financed by the European Commission (e.g. cost, funding, contract type, duration, coordinator, participants…).

Bertoni and Martí (2011)[1] provided a detailed description of the VICO-project[2] database and of the sampling process that led to the creation of the dataset. We limit ourselves here to a more concise description. The dataset includes information on 8,367 NTBFs operating in 6 European countries: Belgium, Finland, France, Germany, Italy, Spain, and the United Kingdom. All companies included in the sample were founded after 1984, were independent at foundation (i.e. not controlled by other firms), and operate in the industries classified as "Medium/High-tech sectors" by the Statistical classification of economic activities in the European Community (Eurostat, 2009). The VICO dataset includes two groups of companies: a sample of VC-backed companies and a control group of non-VC-backed companies. All VC-backed companies received their first round of VC between 1994 and 2004 and were less than 10 years old at that time. Both successful and non-successful deals are included and the sample is made of surviving and non-surviving companies. The dataset is composed of 758 VC-backed and 7588 non VC-backed firms (control group).

As to the CORDIS database, it contains data of individual Research and Technology Development projects co-financed since 1986 with the budget of the European Communities through the RTD Framework Programmes. The project data available in CORDIS concern: - project name, start and end date, contract type, programme type, cost and funding amount, description, keywords; - contact data, including nationality, on the project coordinator and partners. CORDIS database contains these data for 643 NTBFs included in the VICO-project database, i.e. these firms participated in at least one project. The total number of projects involving sample NTBFs is 1398. For these projects, data on their cost, funding, status, Framework Programme, contract type, duration, coordinator identity, number and characteristics of the partners were extracted.

The resulting dataset is analyzed in the next Section.

[1] Bertoni, F., Martí, J., 2011. Financing Entrepreneurial Ventures in Europe: The VICO Dataset. Available at SSRN: http://ssrn.com/abstract=1904297.

[2] This database is the result of a project aiming to assess the impact of Venture Capital (VC) investments on the economic performance of entrepreneurial firms in Europe as reflected by their innovation rates, employment creation, growth, investments and efficiency.

3. Empirical analyses

3.1 Data description and statistics

3.1.1 Firm level statistics

By matching VICO and CORDIS databases, we end up with a total sample composed of 8346 firms participating in 1398 EU projects. We use this sample in computing overall statistics, although the number of observations used in the estimated models is reduced due to missing data (e.g. lack of accounting data for all German firms).

The following table provides a breakdown by industry, country and foundation period of the NTBFs participating (at least once) in EU projects and of the ones acting (at least once) as coordinator.

Insert Table 1 almost here

The average participation rate (participation in at least one EU project in the whole life of the NTBF) in the sample is 7.7%, while the coordination rate is 0.85% (11.0% of the participating firms).

It is remarkable to note that three fourths of the NTBFs participating in EU projects operate in Software, ICT and Biotech & Pharmaceutical sectors. For what concerns the country breakdown, France, Italy and Belgium have significantly higher participation rate in EU projects with respect to other countries. According to the Pearson $\chi 2$ test, there are statistically significant relationships between participation on one side and industry, country and foundation year categories on the other. In other words there are significant differences in terms of composition of the participating firms subsample with respect to the whole sample.

Restricting the analysis on the participating firms, there is no statistical evidence of differences in industry, country and foundation period between coordinating and non-coordinating firms. This figure seems to suggest that the coordinating (sub-) sub-sample has no different characteristics with respect to the participating sub-sample.

Table 2 shows the total number of projects participated (coordinated): 49% of the participating NTBFs take part in more than one project; in addition the average number of projects for participating firms is 2.2 confirming that serial participation is a habit, probably because of the existence of learning curves in the application process and in project participation.

Insert Table 2 almost here

For what concerns coordination, this phenomenon seems less relevant: participating firms act as coordinator in 0.25 projects on average and only 28% of firms coordinate more than one project.

Table 3 presents a breakdown of participating and coordinating firms in terms of age and size classes in the year in which the project started. We decided to focus this analysis only on the first project (for each firm) in order to have figures at the firm level that are net of the serial participation phenomenon.[3]

Insert Table 3 almost here

The Pearson $\chi 2$ test documents that coordinating NTBFs are substantially different in terms of size distribution (both sales and number of employees) with respect to participating but non-coordinating ones. On the contrary, we do not find differences in the age distribution. This is in line with figures in Table 4, reporting the average values of age, total assets, sales and number of employees for participating firms in the starting year of the first project.

Insert Table 4 almost here

We also performed a univariate t-test on the difference in means between coordinating and participating (but not coordinating) NTBFs. While age is not statistically different between these two groups, coordinating firms are statistically bigger in term of employees (54 employees) but not in terms of sales or total assets, in comparison with the average participant (respectively 39 employees, 10 M€ of total assets and 4M€ of sales).

Another interesting fact is the percentage of VC-backed firms participating in EU projects (see Table 5 below). In fact, while only 9% of the sample firms are VC-backed, nearly 26% of the NTBFs participating in the EU projects also received VC financing. This figure suggests the existence of some form of complementarity between the participation in EU projects and Venture Capital. On the contrary we do not find the same relation between coordination and VC, conditionally on participation.

Insert Table 5 almost here

[3] Using all the projects would probably increase size and age average values while adding noise to the characteristics observed at the "entry time".

We also performed a t-test on the difference in participation rate before and after receiving VC (focusing only on the 758 NTBFs that actually received VC in their life): after receiving VC the average yearly participation rate doubles from 2% to 4% ($p<0.001$). On the contrary, there is no statistically significant increase in the yearly coordination rate (given participation) after VC entry. This figure suggests that VC entry tends to precede, at least temporally, the participation in EU projects.

3.1.2 Project level statistics

In Table 6 we move to the project level, showing the characteristics of the 1398 projects in which sample NTBFs participated. The average EU project lasts 35 months, involving 13 participants in 6 countries and receiving 3.6 Million € of EU funding.

Insert Table 6 almost here

We distinguished between projects in which sample NTBFs act as coordinators and the ones in which they are simple participants and performed a univariate t-tests on the differences in means of project characteristics. As shown in Table 6, there are substantial differences in terms of length, number of participants, number of countries involved, cost of the project and amount of EU funding. The projects coordinated by a NTBF seem to be smaller than the projects in which a NTBF merely act as participant; however the average funding per participant is not statistically different.

We also computed two index of diversity of the participants of the project. The first one is a geographical diversity index based on the countries to which the participants belong. The second is an index highlighting the diversity in the "type/aim of organizations" of the project partners (five groups are taken into consideration: education, research, industry, consultancy and others). The two indicators reflecting these measures of project diversity have been constructed using the inverse normalized Herfindahl formula $H^* = 1 - \frac{H-1/N}{1-1/N}$, where H is the classical Herfindahl index ($H = 1 - \sum_i x_i^2$); x_i is the share of participants belonging to the same country (of the same organization type); N is the total number of participants. The normalization rescales the index in the range [0, 1] and makes the index comparable between projects with a different numbers of participants. The analysis of these indexes shows that there is no difference in geographical diversity between projects in which sample NTBFs act as coordinators and the ones in which they act as simple participants, however, when a NTBF is coordinating the projects tend to be more heterogeneous in terms of types of organization involved.

3.2 Econometric analysis

The (main) dependent variable used to analyze participation (coordination) is a dummy equal to one in the starting year of a project in which the NTBF is involved as participant (coordinator). Given the panel structure of our dataset, we used lagged explanatory variables as regressors in order to reduce potential endogeneity / reverse causality issues.

The explanatory variables that are common to all models are the logarithms of total assets and age, i.e. *ln(Total Assets)* and *ln(Age)*, and their squared terms, *ln(Total Assets)2* and *ln(Age)2*. We use two proxies related to the experience in participating (not as coordinator) and coordinating projects, i.e. *ln(N. Past non-Coord. Projects)* and *ln(N. Past Coord. Projects)* respectively. *Patent Stock* is a depreciated sum of patents, with a yearly depreciation rate of 0.15, interacted with a dummy indicating that the firms operates in manufacturing sector. *Cash flow / Sales* and *Debt / Total Assets* are self-defining accounting ratios proxying the amount of internal finance available to the firm and its leverage. For what concerns the explanatory variables referring to the investors, they are step dummy variables equal to one from the year after the entry of the investor(s). Namely, *VC support* indicates the first round of investment received by the NTBF by a generic VC investor, *VC syndication* indicates that the first investment round was syndicated by a pool of investors. The variables *IVC lead*, *CVC lead*, *BVC lead* and *GVC lead* specifies the typology of the lead investor in the first investment round, more specifically whether the VC was Independent (IVC), affiliated to a company engaged in corporate venturing activities (CVC), affiliated to a financial institution / bank (BVC) or affiliated to a governmental organization (GVC). Statistics about explanatory variables are presented in the Table 7.

Insert Table 7 almost here

We estimate several types of model aimed at analyzing participation and coordination, three of them are at the firm level with a panel setting (although we used also some pooled models) and one cross-sectional at the firm-project level.

In Table 8 and Table 9 we show random effect panel probit models (pooled probit models are presented too) on participation and coordination respectively. In analyzing the probability that a NTBF coordinates an EU project, we restrict the sample to the participating firms. The underlying assumption is that the decision to act as coordinator is made by a NTBF *only* conditional on participation. [4] Here the assumption is that the distribution of the dummy variable about

[4] The decision process we have in mind here is a sequential process in which a NTBF first decides whether to participate and then to opt for being a simple participant or a coordinator. This is in line also with our findings in the

coordination is defined only for participating firms, therefore we are interested in doing conditional inference and the results have to be interpreted "with respect to the population of firms participating in EU funded projects".[5]

In the following models we make a different assumption, in that we assume that a firm choses between i) the non-participation, ii) the participation as non-coordinator and iii) the participation as coordinator. [6] Therefore in Table 10 and Table 11, we present multinomial probit models, pooling firm-year observations and clustering standard errors at the firm level.

In Table 12 and 13 we estimate Cox and Weibull survival models, where the failure event is defined either as the participation to a project (Table 12) or as the coordination of a project (Table 13). In this latter case, similarly to Table 9, we restrict the sample to participating firms only, so coordination is defined only for the participant subpopulation. By using survival models we aim at looking at the determinants of the first participation (coordination), given that the first time seems to be the most challenging one.

Last but not least, we shift to the firm-project level and look also at the project level determinants of coordination, given participation. Table 14 and Table 15 present cross sectional probit models, combining both firms' and projects' characteristics as explanatory variables.

In all probit models we show marginal effects, that allows a direct comparison of the results (in terms of magnitude) between the different specifications and t-statistics. For the variables entering with squared terms we decided to graph their marginal effects in order to make the interpretation easier.

3.2.1 Participation

Table 8 analyzes the likelihood for a NTBF to participate in a EU project. For what concerns industry and country, the two models confirm the results presented before: Belgian, Italian and French firms are more likely to participate; the same holds for the firms operating in Biotech & Pharmaceuticals and high-tech services sectors. Although the variables about age and total assets are seldom significant, joint tests on linear and quadratic term refuse the hypothesis that they are equal to 0. Therefore, we computed the marginal effects (at the means) and graph them at different percentiles (from the 10^{th} to the 90^{th}, with steps of 10) of the underlying variable. The size positively affects the probability of participation while age has a negative effect.

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data analysis about the lack of difference (in industry, country and foundation period distributions) between the subsample composition of coordinating and participating but not coordinating NTBFs.

[5] It follows that in this setting the application of a Heckman selection model is unnecessary.

[6] The decision process we have in mind is a single step process in which a NTBF decides in which between the 3 possible outcomes.

Insert Table 8 almost here

We find a very strong (both in term of magnitude and significance) positive effect of the past experience that a NTBF has in participating in EU projects (number of projects that the firm has been participating in the past, not as coordinator). This evidence suggests the significance of learning curves in the application process (e.g. consortia formation, drafting project proposal) and/or in the execution phase (e.g. coordination between partners, communication with EC) reducing participation costs (potentially increasing benefits).

For what concerns accounting variables in the model, the level of debt negatively affects the participation while cash availability has essentially no effect. The patent stock presents no significant effect too on participation probability.

Besides, all models agree in proving a positive significant impact of VC financing on participation, moreover, disentangling the effect according to the different typology of investors, we find that the effect is related to the presence of Bank and Government affiliated VC as lead investors.

In Table 10 participation is defined in a different way because it does not comprise when a NTBF act as coordinator, in other word the dependent variable is about mere participation.

Insert Table 10 almost here

Notwithstanding the slightly different definition, the results are very similar to those obtained in previous model; also estimated marginal effects are similar in terms of sign, significance and shape.

In Table 11 we look at the first participation only, defined to be the "failure" in the shown survival models. We omit both age variables and of course the number of past participations (since a firms "fails" at the first). Results do not show significant differences, and the role of investors is fully confirmed.

Insert Table 11 almost here

3.2.1 Coordination

In Table 9 we restrict the sample to the participating firms and look at the coordination probability. We find no robust evidence of industry or country that exhibit higher coordination propensity, neither an effect of the coordination or participating experience (number of project coordinated by the NTBF in the past). Also the presence and type of VC investors seem to be negligible.

Insert Table 9 almost here

Quite surprisingly, we find no significant firm-level determinants of coordination by a NTBF, neither age nor size. The results are very similar to the ones obtained in multinomial probit model (Table 11), where the probability of coordination is estimated on the whole sample, given the different assumptions we made.

Interestingly, we find differences when looking only at the first participation as coordinator (given participation). In fact, in Table 12, patent stock does have a positive effect, probably certifying the eminence / scientific quality of the leading organization proposing a project for the first time. The absence of this evidence in previous models suggests that this effect may vanish in time and controlling for project experience.

Insert Table 12 almost here

We find also an effect of Bank VCs on the probability of take the lead of a EU project for the first time, thus suggesting that VC investors may play a role also in the decision to act as coordinator.

In Table 13 we move to the firm-project level, thus the analysis is "by definition" conditional on participation to a particular project. At this level of analysis, we can look also at the characteristics of the projects and to firm-project interactive variables.

Insert Table 13 almost here

In contrast with panel models, we find a positive role of coordination experience (number of project coordinated by the NTBF in the past) on the probability of acting as coordinator, while participating experience remains irrelevant. The fact that a NTBF takes the lead in a project is also found negatively correlated with the number of countries involved and the length of the project.

As robustness check we also estimate a model with firm-project interaction variables, the results as showed by the marginal effect are identical to the one presented in the table.

4. Conclusions and discussion

The present work aim at contributing to the existent literature by providing some original empirical evidences of NTBFs' participation (and coordination) to R&D collaborative projects funded by the European Union. This topic is particularly relevant nowadays. On the one side, NTBFs' participation to these projects is a primary objective of EU research and innovation policies (Small Business Act, 2008). On the other side, a weakness stressed by the existing RTD Framework Programmes is the difficulty in participation that NTBFs, and SMEs in general, face. In the Programmes established by EU for the period 2014-2020, Horizon 2020 and COSME (Programme for the Competitiveness of Enterprises and SMEs), 15% of the total 80 billion € budget is reserved to SMEs, moreover one of the aim is the simplification of the access to these Programmes and the design of specific financing schemes for innovative projects conducted by SMEs.
The empirical analysis, based on an extensive sample composed of 8346 European NTBFs, allow us to describe the characteristics of the NTBFs participating in EU projects. An original aspect of this work is the analysis of the decision to coordinate a project, a role that confers visibility and prestige but that requires additional efforts in managing the project and coordinating participants.

The average participation and coordination rate in the sample are 7.7% and 0.85% (11.0% of the participating firms) respectively and most of the firms operate in Software, ICT and Biotech & Pharmaceutical sectors. Country-wise, Italy, France, and Belgium have significantly higher participation rate in EU projects with respect to other countries.

Serial participation by a NTBF is a frequent phenomenon: 49% of the participating NTBFs take part in more than one project and the average number of projects for participating firms is 2.2. This evidence suggests the presence of learning economies in designing and executing a project. The NTBFs that "know the rules" and that have already developed a network, manage to get in projects and manage them with lower costs (most of those are sunk and related to the first participation). Therefore, some good quality NTBFs may decide to abstain from presenting an application because a lack of an adequate knowledge of these supporting schemes.

In Europe, coordinating firms are not different with respect to mere participants in term of sector and country. Looking at the year of the first project, coordinating NTBFs are bigger in terms of number of employees. Only NTBFs with an adequate organizational structure are likely to overcome administrative and partner coordination burden. We also analyze what are the average characteristics of a project involving a NTBF. We find that projects coordinated by a NTBF are significantly different: they are smaller in terms of the number of participants, number of countries involved, total cost of the project and total co-funding provided by the EU, suggesting that

coordination costs arising from the management of large projects are difficult to sustain for a NTBF. It's likely that there is a dimensional threshold for projects coordinated by a NTBF, probably because of the high organizational costs that bigger projects entail.

Another interesting evidence is the relation between Venture Capital and project participation: VC-backed firms are about 3 times more likely to participate in FP projects and the yearly participation rate of a NTBF doubles after the entry of a VC investor. This evidence suggests the existence of some complementarities between the participation in the EU projects and the presence of VC investors. However, no statistically significant increase in the coordination probability was found after VC entry. Moreover, we find that the typology of investors do matters, with bank and governmental affiliated VC investors that positively affects the participation probability, while classical independent and corporate sponsored VC have no effect.

The econometric analyses, using non-participating NTBF ad control group, mostly confirm statistical evidence by using different models (and different underlying hypothesis).

A natural future development of this study is the analysis of post-participation performances of NTBFs, while taking into account the selection into these collaborations. This two-step analysis would clearly lead to a better understanding of the real benefits, at the firm level, engendered by the involvement of NTBFs in RTD projects. This would give more precise indication to policy makers.

Another attractive research direction is about the degree of complementarity or substitution between EU / national supporting schemes and venture capital funding. This would provide very interesting information for policy makers and would highlight the possible existence synergic benefits from combining public and private support for NTBFs.

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Tables and figures

Table 1: NTBFs participating (coordinating) in EU-funded projects: breakdown by industry, country and foundation period

	All firms		Participating firms			Coordinating firms		
	(a) No.	Col %	(b) No.	Col %	(b)/(a)	(c) No.	Col %	(c)/(b)
Industry								
Internet	972	11.65	62	9.64	6.38	4	5.63	6.45
TLC	387	4.64	22	3.42	5.68	5	7.04	22.73
Software	3747	44.9	214	33.28	5.71	21	29.58	9.81
ICT manufacturing	1499	17.96	125	19.44	8.34	9	12.68	7.20
Biotech & Pharmaceuticals	865	10.36	145	22.55	16.76	22	30.99	15.17
Other high-tech manufacturing	456	5.46	24	3.73	5.26	3	4.23	12.50
Other high-tech services	420	5.03	51	7.93	12.14	7	9.86	13.73
Total	**8346**	**100**	**643**	**100.00**	**7.70**	**71**	**100**	**11.04**
Country								
Belgium	914	10.95	93	14.46	10.18	11	15.49	11.83
Finland	760	9.11	36	5.6	4.74	0	0	0.00
France	1726	20.68	191	29.7	11.07	25	35.21	13.09
Germany	1335	16	53	8.24	3.97	7	9.86	13.21
Italy	1052	12.6	123	19.13	11.69	12	16.9	9.76
Spain	877	10.51	49	7.62	5.59	6	8.45	12.24
UK	1682	20.15	98	15.24	5.83	10	14.08	10.20
Total	**8346**	**100**	**643**	**100**	**7.70**	**71**	**100**	**11.04**
Foundation Period								
1984-1989	1016	12.17	96	14.93	9.45	14	19.72	14.58
1990-1994	1234	14.79	106	16.49	8.59	18	25.35	16.98
1995-1999	2937	35.19	223	34.68	7.59	21	29.58	9.42
2000-2004	3159	37.85	218	33.9	6.90	18	25.35	8.26
Total	**8346**	**100**	**643**	**100**	**7.70**	**71**	**100**	**11.04**

Table 2: Number of projects participated and coordinated by firm

	Participating firms		Coordinating firms	
	No.	**Col %**	**No.**	**Col %**
N. projects participated / coordinated				
0	-	-	572	88.96
1	328	51.01	51	7.93
2	119	18.51	15	2.33
3 to 5	142	22.08	5	0.78
more than 5	54	8.4	0	0.00
Total	**643**	**100**	**643**	**100**

Table 3: Breakdown by age and size of participating firms (in the starting year of the first project as participant or coordinator): coordinating Vs. non coordinating firms

	Participating firms		Participating and non-coordinating firms			Coordinating firms Coordinating		
	No.	**Col %**	**No.**	**Col %**	**Row %**	**No.**	**Col %**	**Row %**
Age classes								
0-2 yo	166	24.85	147	24.62	88.55	19	26.76	11.45
3-5 yo	195	29.19	180	30.15	92.31	15	21.13	7.69
6-10 yo	192	28.74	171	28.64	89.06	21	29.58	10.94
11-15 yo	74	11.08	64	10.72	86.49	10	14.08	13.51
more than 15 yo	41	6.14	35	5.86	85.37	6	8.45	14.63
Total	**668**	**100**	**597**	**100**	**89.37**	**71**	**100**	**10.63**
Size classes (number of employees)								
0-9 emp.	183	40.22	176	43.67	96.17	7	13.46	3.83
10-49 emp.	204	44.84	173	42.93	84.8	31	59.62	15.2
50-249 emp.	56	12.31	46	11.41	82.14	10	19.23	17.86
more than 250 emp.	12	2.64	8	1.99	66.67	4	7.69	33.33
Total	**455**	**100**	**403**	**100**	**88.57**	**52**	**100**	**11.43**
Size classes (sales)								
0-2,000 kEuros	327	69.87	296	71.15	90.52	31	59.62	9.48
2,000-10,000 kEuros	112	23.93	98	23.56	87.5	14	26.92	12.5
10,000-50,000 kEuros	20	4.27	16	3.85	80	4	7.69	20
more than 50,000 kEuros	9	1.92	6	1.44	66.67	3	5.77	33.33
Total	**468**	**100**	**416**	**100**	**88.89**	**52**	**100**	**11.11**

Table 4: Firms' characteristics in the year of the first project: coordinating Vs. non coordinating firms

	Participating firms			Participating and non-coordinating firms	Coordinating firms	t-test
	Mean	**SD**	**Median**	**(a) Mean**	**(b) Mean**	**(a)-(b)**
Age	6.12	4.80	5.00	6.14	7.01	-0.873
Headcount	38.87	124.80	11.00	36.25	90.10	-53.85*
Total assets	9,999.46	90,138.07	1080.50	9,576.55	16,372.22	-6795.7
Sales	4,335.19	18,335.47	708.50	4,072.03	9,839.86	-5767.8
Observations	**643**			**597**	**71**	**668**

Table 5: The effect of Venture Capital on participation rate and coordination rate (given participation)

	All firms		Non participating firms			Participating firms			Coordinating firms		
	No.	**Col %**	**No.**	**Col %**	**Row %**	**No.**	**Col %**	**Row %**	**No.**	**Col %**	**Row %**
Non VC-backed	7588	90.92	7113	92.34	93.74	475	73.87	6.26	48	67.61	10.11
VC-backed	758	9.08	590	7.66	77.84	168	26.13	22.16	23	32.39	13.69
Total	**8346**	**100**	**7703**	**100**	**92.3**	**643**	**100**	**7.7**	**71**	**100**	**11.04**

Table 6: Projects' characteristics: coordinated by a NTBF Vs. participated and non-coordinated by a NTBF

	Participated			Participated and non-coordinated	Coordinated	t-test
	Mean	**SD**	**Median**	**(a) Mean**	**(b) Mean**	**(a)-(b)**
Project length (months)	34.96	12.77	36.00	35.54	30.45	5.087***
Number of participants	13.37	12.88	9.00	13.90	9.29	4.613***
Number of countries involved	6.11	3.31	5.00	6.30	4.62	1.681***
Cost of the project (Euros)	6,053,597	11,484,618	3,094,137	6,288,559	4,161,808	2126751.1***
Amount of EU funding for the project (Euros)	3,659,319	5,965,969	1,950,000	3,809,209	2,485,716	1323492.9***
Average funding for participant (Euros)	249,716	209,890	218,833	251,956	232,259	19697.2
Geographical dispersion index	0.84	0.11	0.86	0.84	0.83	0.00823
Organization dispersion index	0.49	0.23	0.54	0.49	0.55	-0.0678**
Observations	**1398**			**1237**	**161**	**1398**

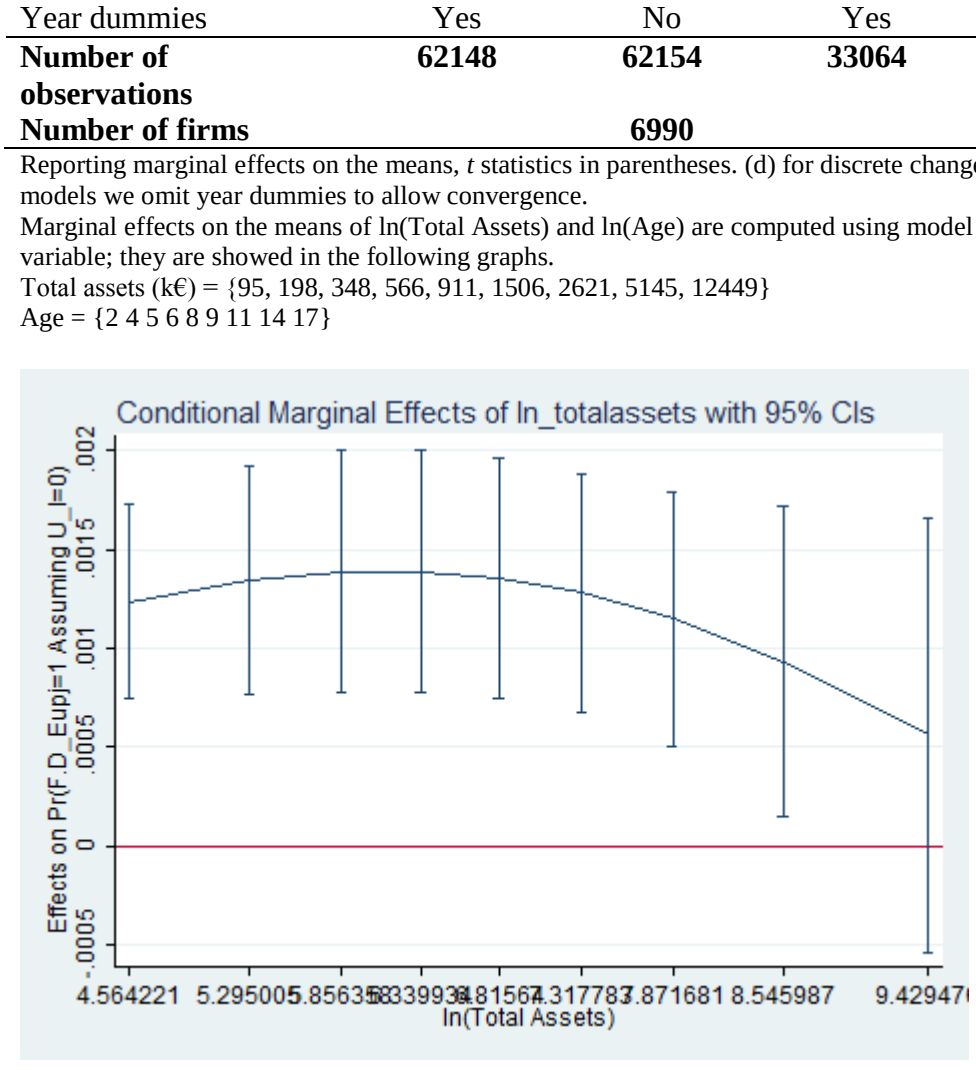
Table 7: explanatory variables statistics

	N. Obs.	Mean	SD	Median	Min	Max
ln(Total Assets)	62154	6.27	2.09	6.25	0.00	15.69
ln(Total Assets)2	62154	43.66	27.27	39.09	0.00	246.19
ln(Age)	62154	1.99	0.72	2.08	0.00	3.26
ln(Age)2	62154	4.48	2.60	4.32	0.00	10.62
ln(N. Past non-Coord. Projects)	62154	0.06	0.25	0.00	0.00	2.56
ln(N. Past Coord. Projects)	62154	0.01	0.07	0.00	0.00	1.61
Patent Stock, Manufacturing sector	62154	0.08	1.48	0.00	0.00	133.31
Cash flow / Sales	47751	0.00	0.41	0.06	-1.39	0.99
Debt / Total Assets	42448	0.20	0.38	0.07	0.00	2.83
VC support (step)	62154	0.08	0.26	0.00	0.00	1.00
VC syndication in the first round (step)	62154	0.02	0.14	0.00	0.00	1.00
IVC lead step	62154	0.04	0.19	0.00	0.00	1.00
CVC lead step	62154	0.01	0.07	0.00	0.00	1.00
BVC lead step	62154	0.01	0.08	0.00	0.00	1.00
GVC lead step	62154	0.02	0.12	0.00	0.00	1.00

Table 8: The determinants of participation, a probit model

	(1) pooled Probit mfx/se	(2) Probit RE mfx/se	(3) pooled Probit mfx/se	(4) Probit RE mfx/se	(5) pooled Probit mfx/se	(6) Probit RE mfx/se	(7) pooled Probit mfx/se	(8) Probit RE mfx/se
ln(Total Assets)	0.002***	0.001***	0.004***	0.003***	0.004***	0.003***	0.004***	0.003***
	(3.197)	(2.852)	(3.077)	(2.687)	(3.075)	(2.684)	(3.076)	(2.725)
ln(Total Assets)2	-0.000	-0.000	-0.000**	-0.000*	-0.000**	-0.000*	-0.000**	-0.000*
	(-1.527)	(-1.203)	(-2.023)	(-1.648)	(-2.024)	(-1.651)	(-1.986)	(-1.653)
ln(Age)	-0.002	-0.001	-0.002	-0.002	-0.002	-0.002	-0.001	-0.002
	(-1.156)	(-1.483)	(-0.741)	(-1.245)	(-0.739)	(-1.244)	(-0.533)	(-1.084)
ln(Age)2	-0.001	-0.000*	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(-1.374)	(-1.703)	(-1.193)	(-1.111)	(-1.190)	(-1.107)	(-1.450)	(-1.299)
ln(N. Past non-Coord. Projects)	0.019***	0.009***	0.022***	0.013***	0.022***	0.013***	0.022***	0.014***
	(20.347)	(5.295)	(16.909)	(6.886)	(16.909)	(6.873)	(16.951)	(6.999)
ln(N. Past Coord. Projects)	0.005***	0.003*	0.002	0.002	0.002	0.002	0.002	0.002
	(3.154)	(1.881)	(0.865)	(0.888)	(0.866)	(0.881)	(0.645)	(0.718)
Patent Stock, Manufacturing sector	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(1.157)	(1.325)	(1.150)	(1.251)	(1.151)	(1.255)	(1.146)	(1.231)
Cash flow / Sales			-0.003***	-0.002***	-0.003***	-0.002***	-0.003***	-0.002***
			(-3.042)	(-3.166)	(-3.005)	(-3.122)	(-3.219)	(-3.298)
Debt / Total Assets			-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
			(-1.437)	(-1.577)	(-1.441)	(-1.584)	(-1.478)	(-1.588)
VC support (step) (d)	0.010***	0.007***	0.009***	0.007***	0.009***	0.007***		
	(6.212)	(5.086)	(4.343)	(3.834)	(3.699)	(3.187)		
VC syndication in the first round (step) (d)					0.001	0.001	0.003	0.003
					(0.264)	(0.438)	(1.225)	(1.305)
IVC lead step (d)							0.003	0.003
							(1.355)	(1.358)
CVC lead step (d)							0.001	-0.000
							(0.180)	(-0.118)
BVC lead step (d)							0.017**	0.013*
							(2.358)	(1.830)
GVC lead step (d)							0.014***	0.011**
							(2.877)	(2.433)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	No	Yes	No	Yes	No	Yes	No
Number of observations	**62148**	**62154**	**33064**	**33168**	**33064**	**33168**	**33064**	**33168**
Number of firms		**6990**		**5187**		**5187**		**5187**

Reporting marginal effects on the means, *t* statistics in parentheses. (d) for discrete change of dummy variable from 0 to 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. In random effect probit models we omit year dummies to allow convergence.
Marginal effects on the means of ln(Total Assets) and ln(Age) are computed using model (6) at different percentiles (from the 10th to the 90th, with steps of 10) of the underlying variable; they are showed in the following graphs.
Total assets (k€) = {95, 198, 348, 566, 911, 1506, 2621, 5145, 12449}
Age = {2 4 5 6 8 9 11 14 17}



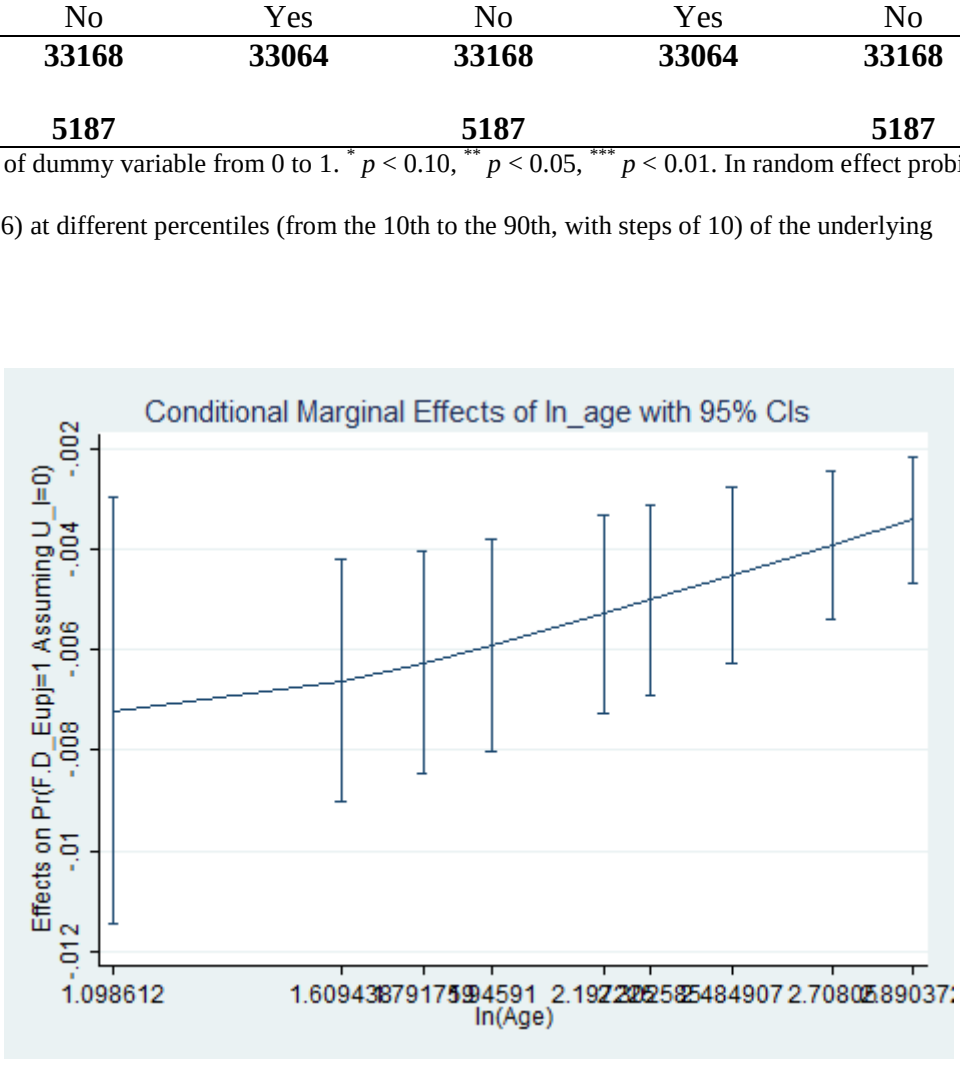
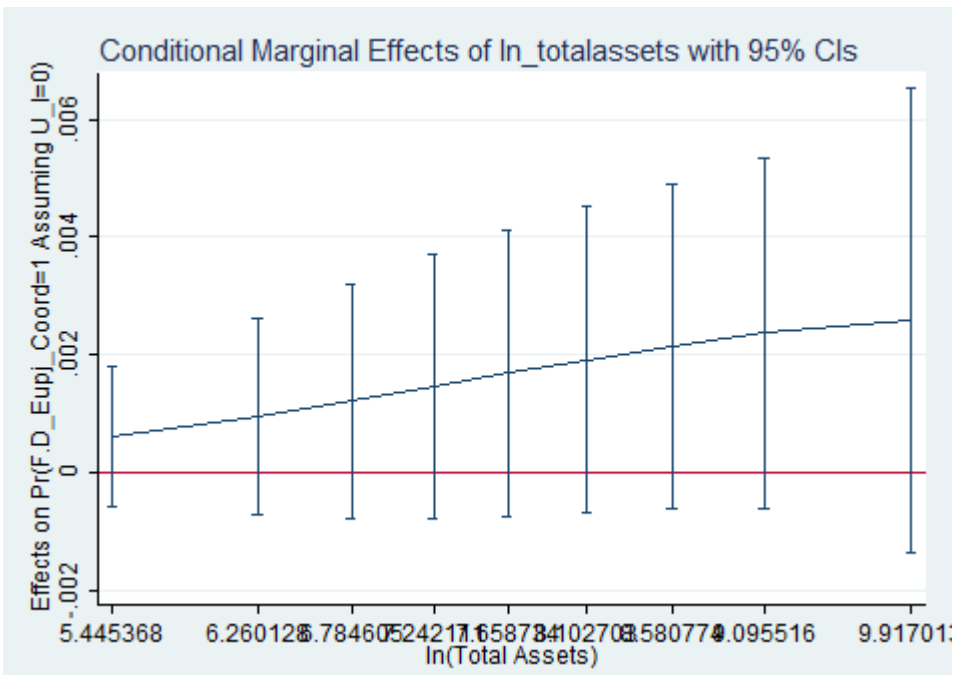
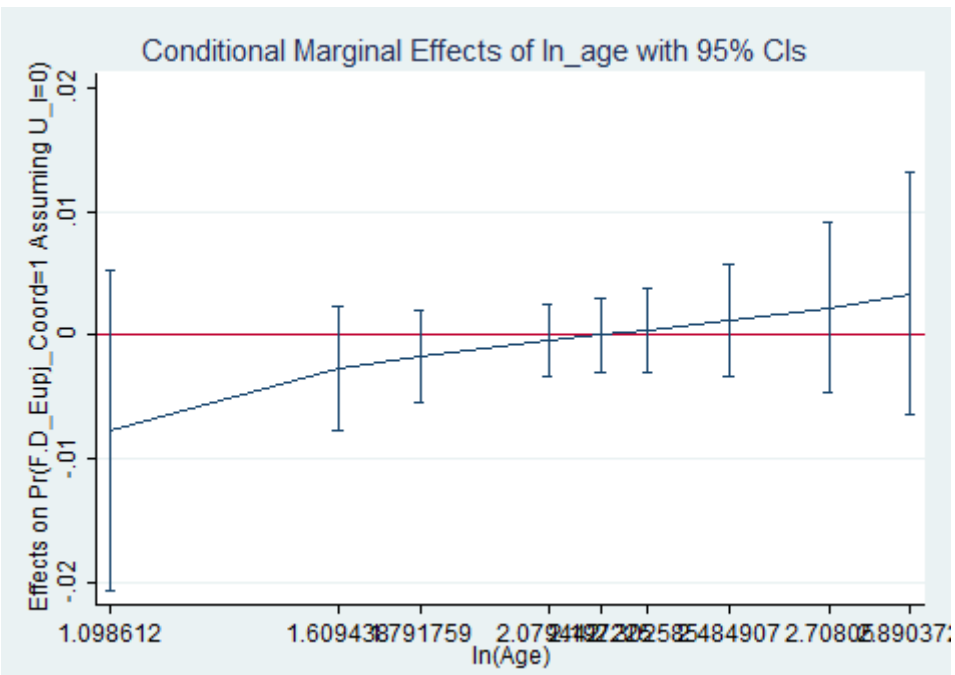


Table 9: The determinants of coordination (given participation), a probit model

	(1) pooled Probit mfx/se	(2) Probit RE mfx/se	(3) pooled Probit mfx/se	(4) Probit RE mfx/se	(5) pooled Probit mfx/se	(6) Probit RE mfx/se	(7) pooled Probit mfx/se	(8) Probit RE mfx/se
main								
ln(Total Assets)	-0.001	-0.001	0.007	0.002	0.006	0.002	0.006	0.002
	(-0.629)	(-0.004)	(1.340)	(0.008)	(1.266)	(0.007)	(1.133)	(0.008)
ln(Total Assets)2	0.000	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(1.473)	(0.004)	(-0.921)	(-0.008)	(-0.843)	(-0.007)	(-0.710)	(-0.008)
ln(Age)	-0.011**	-0.007	-0.016**	-0.005	-0.016**	-0.005	-0.016**	-0.005
	(-2.145)	(-0.004)	(-2.345)	(-0.008)	(-2.342)	(-0.007)	(-2.321)	(-0.008)
ln(Age)2	0.003*	0.001	0.004**	0.001	0.004**	0.001	0.004**	0.001
	(1.781)	(0.004)	(2.236)	(0.008)	(2.233)	(0.007)	(2.185)	(0.008)
ln(N. Past non-Coord. Projects)	0.001	-0.001	0.001	-0.000	0.001	-0.000	0.002	-0.000
	(0.314)	(-0.004)	(0.474)	(-0.008)	(0.599)	(-0.007)	(0.814)	(-0.008)
ln(N. Past Coord. Projects)	0.010***	0.004	0.007*	0.001	0.007*	0.000	0.005	0.000
	(2.886)	(0.004)	(1.918)	(0.008)	(1.811)	(0.007)	(1.415)	(0.008)
Patent Stock, Manufacturing sector	-0.000	0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.203)	(0.004)	(-0.465)	(-0.008)	(-0.503)	(-0.007)	(-0.363)	(-0.003)
Cash flow / Sales			0.001	0.000	0.001	0.000	0.001	0.000
			(0.381)	(0.008)	(0.452)	(0.007)	(0.349)	(0.008)
Debt / Total Assets			-0.007	-0.003	-0.007	-0.003	-0.008	-0.004
			(-1.031)	(-0.008)	(-1.028)	(-0.007)	(-1.198)	(-0.008)
VC support (step) (d)	0.001	0.000	0.005	0.002	0.001	0.000		
	(0.481)	(0.004)	(1.239)	(0.009)	(0.200)	(0.008)		
VC syndication in the first round (step) (d)					0.012	0.004	0.007	0.002
					(1.031)	(0.008)	(0.882)	(0.009)
IVC lead step (d)							0.001	0.001
							(0.214)	(0.009)
CVC lead step (d)							0.024	0.011
							(0.702)	(0.010)
BVC lead step (d)							0.018	0.010
							(1.162)	(0.010)
GVC lead step (d)							-0.004	-0.001
							(-0.821)	(-0.008)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	No	Yes	No	Yes	No	Yes	No
Number of observations	5175	5775	3134	3536	3134	3536	3134	3536
Number of firms		589		490		490		490

Reporting marginal effects on the means, *t* statistics in parentheses. (d) for discrete change of dummy variable from 0 to 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Marginal effects on the means of ln(Total Assets) and ln(Age) are computed using model (6) at different percentiles (from the 10th to the 90th, with steps of 10) of the underlying variable; they are showed in the following graphs.
Total assets (k€) = {95; 198; 348; 566; 911; 1506; 2621; 5145; 12449}
Age = {2; 4; 5; 6; 8; 9; 11; 14; 17}



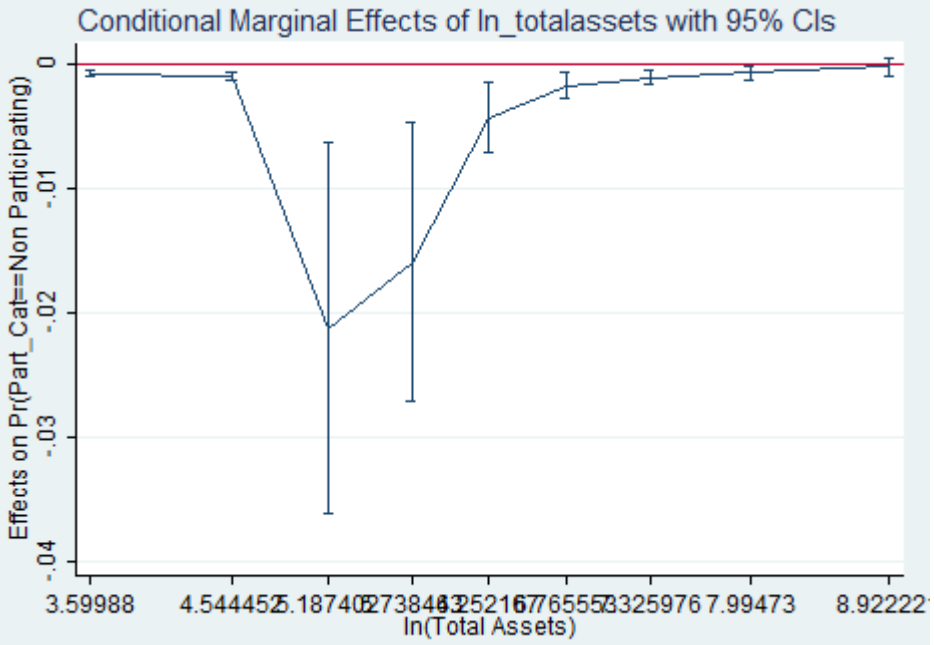


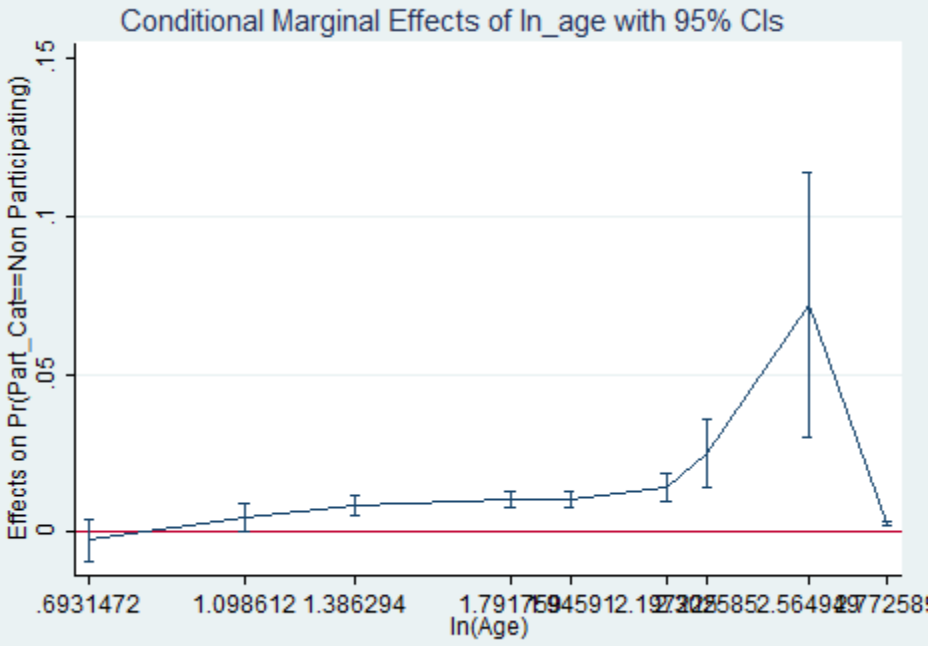
	(1) Multinomial probit pooled			(2) Multinomial probit pooled			(3) Multinomial probit pooled			(4) Multinomial probit pooled		
	Non participating	Participating	Coordinating	Non participating	Participating	Coordinating	Non participating	Participating	Coordinating	Non participating	Participating	Coordinating

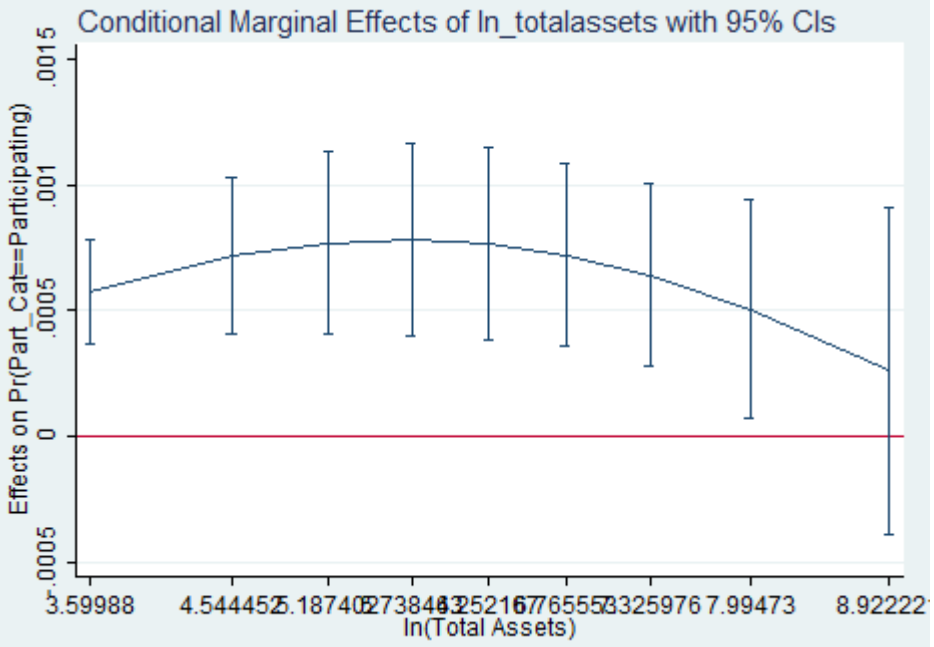
Table 10: The determinants of participation and coordination, a multinomial probit model

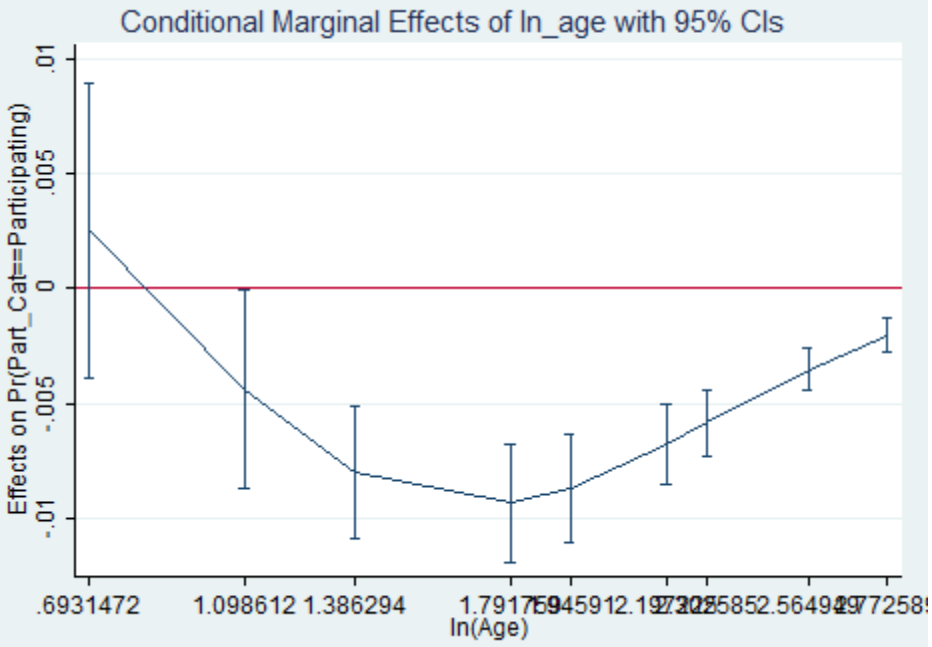
	mfx/se	mfx/se	mfx/se	mfx/se	mfx/se	mfx/se	mfx/se	mfx/se	mfx/se	mfx/se	mfx/se	mfx/se
ln(Total Assets)	-0.001***	0.001***	0.000	-0.002***	0.002**	0.000	-0.002***	0.002**	0.000*	-0.002***	0.001**	0.000*
	(-2.785)	(2.721)	(0.854)	(-2.638)	(2.507)	(1.637)	(-2.673)	(2.540)	(1.663)	(-2.585)	(2.451)	(1.726)
ln(Total Assets)2	0.000*	-0.000*	-0.000	0.000**	-0.000*	-0.000	0.000**	-0.000*	-0.000	0.000**	-0.000*	-0.000*
	(1.870)	(-1.816)	(-0.740)	(2.040)	(-1.920)	(-1.583)	(2.063)	(-1.942)	(-1.612)	(1.969)	(-1.850)	(-1.677)
ln(Age)	-0.002***	0.002***	0.000	-0.003***	0.003***	0.000	-0.003***	0.003***	0.000	-0.003***	0.003***	0.000
	(-3.010)	(2.973)	(0.821)	(-2.610)	(2.588)	(0.590)	(-2.627)	(2.607)	(0.556)	(-2.712)	(2.689)	(0.690)
ln(Age)2	0.001***	-0.001***	-0.000**	0.002***	-0.002***	-0.000	0.002***	-0.002***	-0.000	0.002***	-0.002***	-0.000
	(6.836)	(-6.746)	(-1.973)	(5.367)	(-5.317)	(-1.195)	(5.399)	(-5.353)	(-1.155)	(5.452)	(-5.407)	(-1.210)
ln(N. Past non-Coord. Projects)	-0.011***	0.011***	0.000	-0.013***	0.013***	0.000	-0.013***	0.013***	0.000	-0.013***	0.013***	0.000
	(-11.827)	(11.820)	(0.369)	(-10.381)	(10.361)	(1.091)	(-10.328)	(10.311)	(0.875)	(-10.285)	(10.266)	(1.052)
ln(N. Past Coord. Projects)	0.002*	-0.002**	0.000**	0.002*	-0.003**	0.000	0.003*	-0.003**	0.000	0.003**	-0.003**	0.000
	(1.647)	(-2.112)	(2.060)	(1.870)	(-2.192)	(1.536)	(1.917)	(-2.195)	(1.515)	(1.982)	(-2.227)	(1.507)
Patent Stock, Manufacturing sector	-0.000	0.000	0.000	-0.000	0.000	0.000	-0.000	0.000	0.000	-0.000	0.000	0.000
	(-0.232)	(0.207)	(1.273)	(-0.054)	(0.038)	(1.395)	(-0.068)	(0.054)	(1.408)	(-0.095)	(0.081)	(1.536)
Cash flow / Sales				0.000	-0.000	-0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.000
				(0.462)	(-0.393)	(-1.110)	(0.554)	(-0.488)	(-1.130)	(0.634)	(-0.564)	(-1.244)
Debt / Total Assets				0.001*	-0.001*	-0.000	0.001*	-0.001*	-0.000	0.001*	-0.001*	-0.000
				(1.840)	(-1.749)	(-0.995)	(1.849)	(-1.765)	(-0.964)	(1.925)	(-1.846)	(-0.984)
VC support (step) (d)	-0.001*	0.001*	0.000	-0.001*	0.001*	0.000	-0.002*	0.002*	0.000			
	(-1.837)	(1.736)	(1.166)	(-1.838)	(1.811)	(0.761)	(-1.869)	(1.830)	(0.854)			
VC syndication in the first round (step) (d)				0.001	-0.001	-0.000	0.000	-0.000	-0.000			
				(0.913)	(-0.882)	(-1.267)	(0.423)	(-0.392)	(-1.335)			
IVC lead step (d)							-0.000	0.000	-0.000			
							(-0.370)	(0.374)	(-0.080)			
CVC lead step (d)							-0.002	0.002	0.001			
							(-0.777)	(0.617)	(0.970)			
BVC lead step (d)							-0.006	0.005	0.000			
							(-1.435)	(1.431)	(0.638)			
GVC lead step (d)							-0.003**	0.003**	0.000			
							(-2.013)	(1.990)	(0.457)			
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	62811	62811	62811	33394	33394	33394	33394	33394	33394	33394	33394	33394

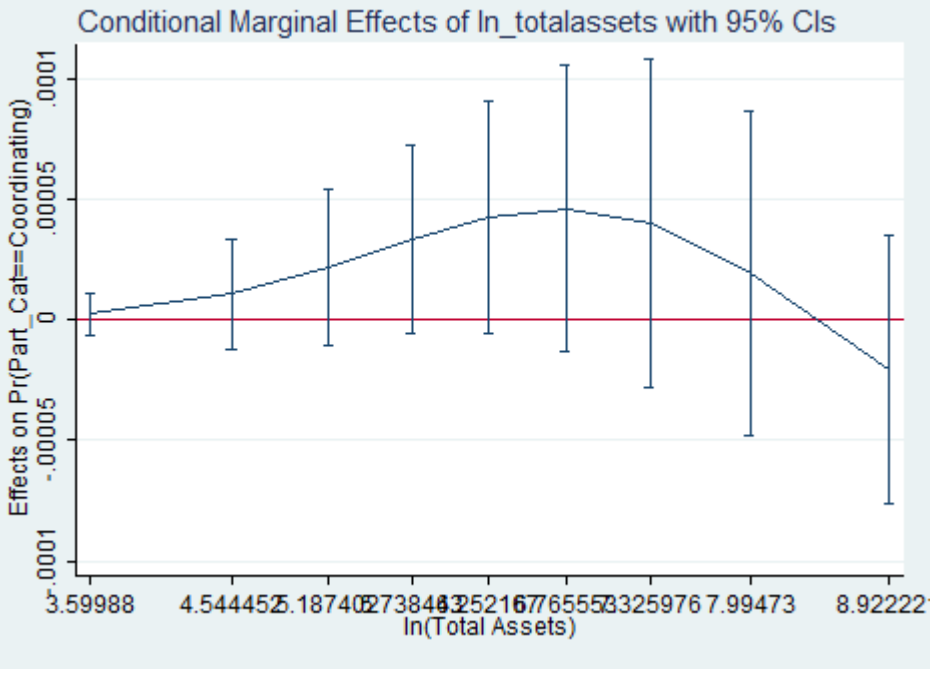
Reporting marginal effects on the means, *t* statistics in parentheses; standard errors are clustered at the firm level. (d) for discrete change of dummy variable from 0 to 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Marginal effects on the means of ln(Total Assets) and ln(Age) on the probability of outcome = {Non participating, Carticipating, Coordinating} are computed using model (3) at different percentiles (from the 10th to the 90th, with steps of 10) of the underlying variable; they are showed in the following graphs.
Total assets (k€) = {95; 198; 348; 566; 911; 1506; 2621; 5145; 12449}
Age = {2; 4; 5; 6; 8; 9; 11; 14; 17}


Conditional Marginal Effects of ln_totalassets with 95% CIs
Effects on Pr(Part_Cat==Non Participating)
-.04
-.03
-.02
-.01
0
3.59988
4.544452
5.187402
7.99473
8.92222
ln(Total Assets)


Conditional Marginal Effects of ln_age with 95% CIs
Effects on Pr(Part_Cat==Non Participating)
0
.05
.1
.15
.6931472
1.098612
1.386294
ln(Age)


Conditional Marginal Effects of ln_totalassets with 95% CIs
Effects on Pr(Part_Cat==Participating)
-.0005
0
.0005
.001
3.59988
4.544452
5.187402
7.99473
8.92222
ln(Total Assets)


Conditional Marginal Effects of ln_age with 95% CIs
Effects on Pr(Part_Cat==Participating)
-.01
-.005
0
.005
.6931472
1.098612
1.386294
ln(Age)


Conditional Marginal Effects of ln_totalassets with 95% CIs
Effects on Pr(Part_Cat==Coordinating)
-.0001
-.00005
0
.00005
.0001
3.59988
4.544452
5.187402
7.99473
8.92222
ln(Total Assets)

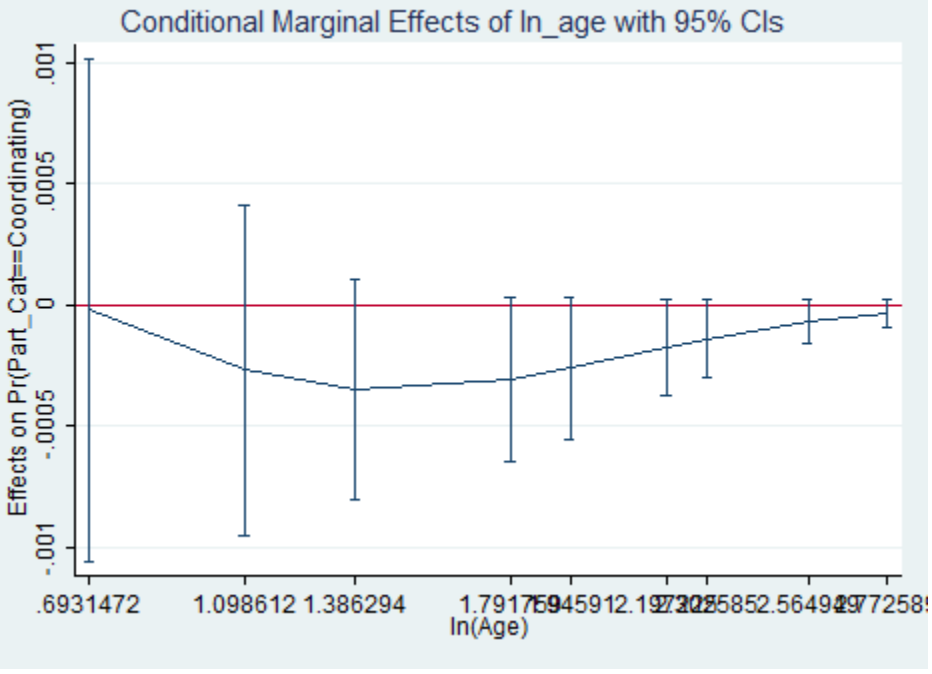

Conditional Marginal Effects of ln_age with 95% CIs
Effects on Pr(Part_Cat==Coordinating)
-.001
-.0005
0
.0005
.001
.6931472
1.098612
1.386294
ln(Age)

Table 11: The determinants of the first participation, a survival model

	(1) Cox b/se	(2) Weibull b/se	(3) Cox b/se	(4) Weibull b/se	(5) Cox b/se	(6) Weibull b/se	(7) Cox b/se	(8) Weibull b/se
main								
ln(Total Assets)	0.470***	0.423***	0.786***	0.698***	0.789***	0.701***	0.807***	0.728***
	(3.537)	(3.208)	(3.389)	(3.009)	(3.394)	(3.017)	(3.464)	(3.129)
ln(Total Assets)2	-0.018**	-0.017*	-0.038**	-0.035**	-0.039***	-0.035**	-0.039***	-0.036**
	(-2.053)	(-1.944)	(-2.568)	(-2.343)	(-2.588)	(-2.364)	(-2.615)	(-2.435)
Patent Stock, Manufacturing sector	0.013	0.013	0.021	0.020	0.021	0.020	0.020	0.019
	(1.132)	(1.146)	(1.260)	(1.238)	(1.297)	(1.271)	(1.218)	(1.185)
Cash flow / Sales			-0.297**	-0.399***	-0.289**	-0.390***	-0.342***	-0.450***
			(-2.550)	(-3.343)	(-2.471)	(-3.255)	(-2.923)	(-3.761)
Debt / Total Assets			-0.092	-0.124	-0.094	-0.127	-0.101	-0.135
			(-0.487)	(-0.667)	(-0.500)	(-0.684)	(-0.535)	(-0.727)
VC support (step)	1.139***	1.267***	0.902***	1.019***	0.825***	0.950***		
	(9.939)	(11.132)	(5.785)	(6.562)	(4.511)	(5.240)		
VC syndication in the first round (step)					0.221	0.199	0.493*	0.485*
					(0.867)	(0.783)	(1.950)	(1.913)
IVC lead step							0.266	0.402
							(1.040)	(1.577)
CVC lead step							-0.023	0.043
							(-0.038)	(0.072)
BVC lead step							1.142***	1.273***
							(3.199)	(3.591)
GVC lead step							1.014***	1.083***
							(3.852)	(4.081)
Constant		-6.872***		-7.756***		-7.748***		-7.805***
		(-13.718)		(-8.496)		(-8.479)		(-8.534)
ln(P)		-0.111**		-0.134*		-0.132*		-0.139**
		(-2.337)		(-1.960)		(-1.941)		(-2.045)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	57797	57797	30659	30659	30659	30659	30659	30659
Number of firms								

Reporting coefficients, *t* statistics in parentheses. (d) for discrete change of dummy variable from 0 to 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 12: The determinants of the first coordination (given participation), a survival model

	(1) Cox b/se	(2) Weibull b/se	(3) Cox b/se	(4) Weibull b/se	(5) Cox b/se	(6) Weibull b/se	(7) Cox b/se	(8) Weibull b/se
main								
ln(Total Assets)	0.226	0.115	1.932*	1.784*	1.932*	1.786*	1.756*	1.632*
	(0.527)	(0.282)	(1.935)	(1.805)	(1.934)	(1.803)	(1.810)	(1.679)
ln(Total Assets)2	0.008	0.012	-0.096*	-0.090	-0.096*	-0.091	-0.085	-0.081
	(0.305)	(0.492)	(-1.646)	(-1.561)	(-1.645)	(-1.560)	(-1.494)	(-1.422)
ln(N. Past non-Coord. Projects)	-0.266	-0.414	-0.256	-0.368	-0.257	-0.373	-0.182	-0.328
	(-0.935)	(-1.500)	(-0.833)	(-1.220)	(-0.832)	(-1.231)	(-0.574)	(-1.054)
Patent Stock, Manufacturing sector	0.103*	0.102*	0.202**	0.162**	0.202**	0.162**	0.208**	0.168**
	(1.668)	(1.674)	(2.235)	(1.977)	(2.234)	(1.977)	(2.322)	(2.079)
Cash flow / Sales			-0.308	-0.452	-0.307	-0.446	-0.306	-0.461
			(-0.957)	(-1.390)	(-0.949)	(-1.361)	(-0.961)	(-1.446)
Debt / Total Assets			-1.004	-1.097	-1.005	-1.104	-1.076	-1.229
			(-1.122)	(-1.189)	(-1.122)	(-1.193)	(-1.200)	(-1.323)
VC support (step)	0.241	0.339	0.253	0.267	0.247	0.216		
	(0.693)	(0.992)	(0.606)	(0.641)	(0.491)	(0.431)		
VC syndication in the first round (step)					0.015	0.122	-0.205	-0.070
					(0.022)	(0.187)	(-0.354)	(-0.123)
IVC lead step							0.361	0.386
							(0.544)	(0.585)
CVC lead step							1.390	1.241
							(1.209)	(1.113)
BVC lead step							1.754***	1.820***
							(2.791)	(2.975)
GVC lead step							-0.563	-0.560
							(-0.532)	(-0.529)
Constant		-6.662***		-13.596***		-13.598***		-13.097***
		(-3.699)		(-3.252)		(-3.245)		(-3.171)
ln(P)		-0.016		0.113		0.115		0.112
		(-0.097)		(0.563)		(0.574)		(0.559)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	5272	5272	3218	3218	3218	3218	3218	3218
Number of firms								

Reporting coefficients, *t* statistics in parentheses. (d) for discrete change of dummy variable from 0 to 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The model is estimated on the firms that have participated in at least one project in their life.

Table 13: The determinants of coordination (given participation), a probit model at the project level

	(1) Probit mfx/se	(2) Probit mfx/se	(3) Probit mfx/se	(4) Probit mfx/se
Coordinating				
ln(Total Assets)		-0.205	-0.202	-0.247
		(-1.209)	(-1.192)	(-1.430)
ln(Total Assets)2		0.021*	0.021*	0.024**
		(1.818)	(1.798)	(2.018)
ln(Age)	-0.349	-0.295	-0.279	-0.185
	(-0.909)	(-0.656)	(-0.618)	(-0.399)
ln(Age)2	0.196	0.146	0.143	0.111
	(1.617)	(1.045)	(1.023)	(0.771)
ln(N. Past non-Coord. Projects)	0.004	0.047	0.049	0.057
	(0.024)	(0.255)	(0.266)	(0.300)
ln(N. Past Coord. Projects)	0.772***	0.771**	0.763**	0.638*
	(2.724)	(2.156)	(2.130)	(1.718)
Patent Stock, Manufacturing sector	-0.001	-0.024	-0.024	-0.017
	(-0.035)	(-0.566)	(-0.565)	(-0.405)
VC support (step)	0.059	0.083	-0.023	
	(0.279)	(0.350)	(-0.075)	
VC syndication in the first round (step)			0.230	0.110
			(0.555)	(0.292)
IVC lead step				-0.178
				(-0.464)
BVC lead step				0.960**
				(2.108)
Number of participants	-0.020	-0.007	-0.006	-0.011
	(-0.637)	(-0.213)	(-0.199)	(-0.342)
Number of countries involved	-0.227***	-0.243***	-0.240***	-0.244***
	(-2.827)	(-2.641)	(-2.615)	(-2.617)
Project length (months)	-0.031***	-0.033***	-0.033***	-0.031***
	(-2.973)	(-2.840)	(-2.846)	(-2.679)
Average funding for (months*participant)	3.160	-0.350	0.005	-3.818
	(0.156)	(-0.014)	(0.000)	(-0.154)
Organization dispersion index	0.443	0.387	0.405	0.378
	(1.285)	(0.978)	(1.017)	(0.933)
Constant	0.588	1.070	1.021	0.913
	(0.533)	(0.831)	(0.796)	(0.723)
Industry dummies	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Number of observations	838	682	682	651
Number of firms				

Reporting marginal effects on the means, *t* statistics in parentheses. (d) for discrete change of dummy variable from 0 to 1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
The unit of observation is the firm-project, i.e. when two firms may participate at the same project there are two observations referring to that project (anyway there are very few cases). Firm-level explanatory variables refers to the year before the starting year of the project.
We estimated also a model with firm-project interaction but the sign of the variables do not change.