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CERIS
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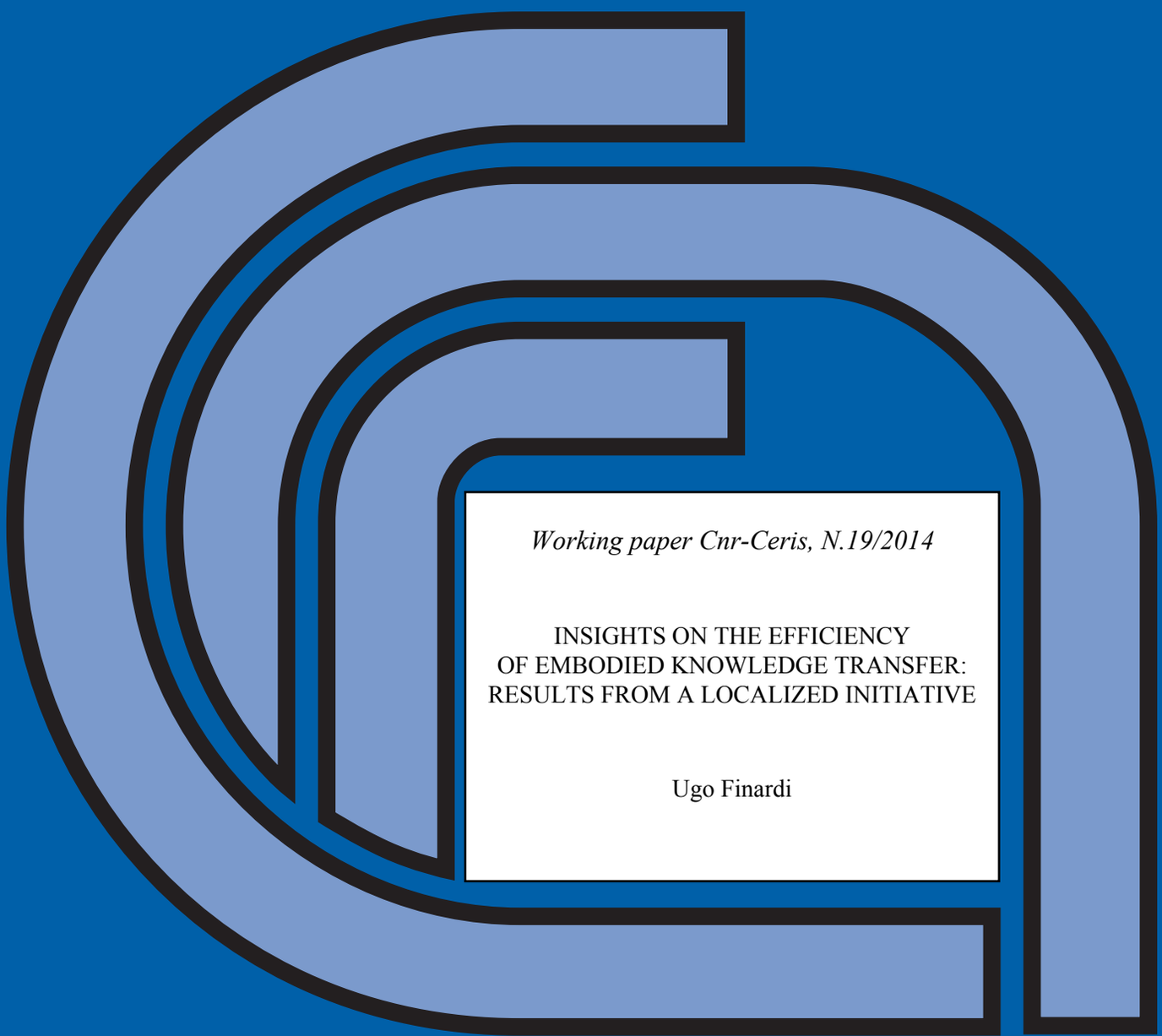
ISSN (print): 1591-0709
ISSN (on line): 2036-8216



Working paper Cnr-Ceris, N.19/2014

INSIGHTS ON THE EFFICIENCY OF EMBODIED KNOWLEDGE TRANSFER: RESULTS FROM A LOCALIZED INITIATIVE

Ugo Finardi

Working Paper

Consiglio Nazionale delle Ricerche
CERIS ISTITUTO DI RICERCA SULL'IMPRESA E LO SVILUPPO

WORKING PAPER CNR - CERIS

RIVISTA SOGGETTA A REFERAGGIO INTERNO ED ESTERNO

ANNO 16, N° 19 – 2014
Autorizzazione del Tribunale di Torino
N. 2681 del 28 marzo 1977

ISSN (print): 1591-0709
ISSN (on line): 2036-8216

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FOTOCOMPOSIZIONE E IMPAGINAZIONE
In proprio

Finito di stampare nel mese di Dicembre 2014

Insights on the efficiency of Embodied Knowledge Transfer: results from a localized initiative

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ABSTRACT: embodied knowledge transfer is a relevant way of connecting public research and firms. The present work analyzes the results of a public initiative aiming at connecting research institutions and Small and Medium Enterprises of the Piedmont Region (northwest Italy). The initiative financed grants to employ young persons in possess of a university degree. Grantees were employed to spend part of their working time in a SME, and part in the collaborating Department/Institute. Drawing on the responses to the final survey of the project, the present work tries to determine whether grantees have been an efficient medium of knowledge transfer. Results show that in many cases they have been determinant, though the result can't be generalized.

Keywords: embodied knowledge transfer; university-industry cooperation; public policy; regional development; SME.

JEL Codes:O15; O33.

Acknowledgements: the present papers exploits data deriving from on official documents and PRO.TE.INN. survey, which are property of COREP. Deeply acknowledged for their collaboration are: Prof. Adriana Luciano (University of Torino and director of FRAME COREP Laboratory); Dr. Monica Demartini and of Dr. Roberta Santi (COREP FRAME Laboratory) who have been working on the PRO.TE.INN. survey; Ing. Michel Patrissi (Director of COREP); Dr. Norberto Patrignani. Prof. Salvatore Coluccia is deeply acknowledged for his continuous help and spur. Prof. Secondo Rolfo, Director of CNR-CERIS is acknowledged for supporting this research field, as well as for scientific collaboration. Colleagues of CNR-CERIS are acknowledged for their help and scientific collaboration. The Usual Disclaimers Apply.

CONTENTS

1. INTRODUCTION

The importance of the relations between scientific and technological research and the industries is nowadays undeniable. Such relations are important both for the economic growth and for the development of research activities in public bodies. This connection has become tighter also thanks to specific initiatives from the policy makers and the public bodies. Such initiatives are promoted in order to overcome the classic "market failure" of the allocation of resources to research activities. One of the ways exploited to this end is enabling firms to access more easily the scientific and technological knowledge produced in research institutions.

The present work exploits the outcome of one of these initiatives to clarify a specific topic related to Knowledge transfer. The database underlying this work derives in fact from the surveys realized in the context of PRO.TE.INN., an "embodied Knowledge transfer" program. This program did finance grants for young persons in possess of a university degree. Grantees did spend their working time between a firm and a research center, thus working as "carriers" of knowledge between the two entities. One of the targets of the surveys has been the measure of the efficiency in terms of Knowledge transfer. The analysis of these data, once put in the context of the initiative, may prove helpful in shedding light on the characters of how persons, in possession of a specific body of knowledge and of interpersonal relations, can be able to act as media to transfer knowledge between a research lab and a firm.

A further element of interest towards the specific case is the geographical context where the knowledge transfer program took place. In fact the initiative was limited to an Italian Province, that is, a partition of a Region: the Province of Torino, in the Region of Piedmont, northwestern Italy. The Council of the Province was the organizer and main sponsor of the initiative. Administrative subdivisions of Regions are not the usual stakeholders in charge of such industrial support initiatives. This makes the specific case even more relevant in its peculiarity.

The following of the paper is organized as follows. Section 2 contains the theoretical framework and literature overview. Section 3 presents the context of industry and research of the Province of Torino, where the project took place. Then section 4 outlines the "Knowledge transfer" project that generated the database exploited in the present work. Subsequently, section 5 describes the experimental activity and its results. Sixth and last section contains the conclusions and learned lessons.

2. THEORETICAL FRAMEWORK AND LITERATURE OVERVIEW

Among the theoretical approaches underlying the present contribution, the farthest in time to be acknowledged goes back to the theory of Absorptive capacity of Cohen & Levinthal (1989; 1990). While the absorptive capacity of involved firms is not measured in the present article, its approach does benefit of the statements of Cohen & Levinthal affirming that "the exercise of absorptive capacity represents a sort of learning that differs from learning-by-doing […] with absorptive capacity a firm may acquire outside knowledge that will permit it to do something quite different" (1989, p. 570). Absorptive capacity is thus a sort of

counterbalance to the efficiency of knowledge transfer media in a specific context. This theoretical view drives the basic idea for this work.

The present work also owes much to the more recent theory of Human capital, discussed in detail by Bozeman & Corley (2004). Bozeman and Corley refer their theoretical approach to the environment of inter-scientists' collaborations. Nevertheless interesting insights can be drawn also in relation to the importance of human capital in the collaborations between research and industry. In particular this approach is fit to frame theoretically the present context. Scientific and technical (S&T) human capital is defined as "the sum of scientific, technical and social knowledge, skills and resources embodied in a particular individual […] the unique set of resources the individual brings to his or her own work and to collaborative efforts […] the sum of skills, knowledge, and social relations needed to participate in science" (p. 601, *passim*). Embodied knowledge transfer is treated in the present paper according to this definition. That is, grantees at the center of the study are defined in terms of their S&T human capital. This capital is, ultimately, what allows a more or less efficient transfer of knowledge in the present case.

In order to better frame the present effort the following of this section contains a literature overview. Some topics, relevant to put in context this article, are discussed reviewing some past contributions.

The first relevant topic to highlight is relative to the nature of the initiative described in this article. PRO.TE.INN., in fact, has not been the only embodied Knowledge transfer program performed in an European Country in the last years. On the contrary, it takes part in a "stream" of similar initiatives from several Countries. One relevant example is the French program CIFRE (Convention Industrielle de Formation par la Recherche) which possibly inspired much the presently described initiative. Heraud & Levy (2005) describe and perform an analysis of this initiative. CIFRE did last much longer than PRO.TE.INN. (in fact it started in 1981) and did employ Ph.D. students rather than graduates, but its scheme basically overlaps that of PRO.TE.INN. The analysis performed in the paper shows the importance of Ph.D. students in bridging between the two communities of academia and industry.

In the U.K. another initiative similar to PRO.TE.INN. and to CIFRE is the Knowledge Transfer Partnership. This has been described by Raban (2006) in the context of an overview of European policies supporting knowledge integration at SMEs. According to Raban "Knowledge Transfer Partnerships increase interactions between universities and companies. Graduates are recruited to work in a company for two years on a strategically important project in close cooperation with a university. They enjoy enhanced career development benefits, while the SME and the university learn to collaborate" (p. 167). Another similar measure, also reviewed by Raban (2006) is the French CORTECHS. In this case technicians from Public Research Organizations are temporarily hired by SMEs wishing to perform an innovation project.

Less specific cases of embodied knowledge transfer have also been discussed in past literature. For instance D'Este & Patel (2007) perform a study on UK academic researchers

aiming at the assessment of the various channels used by academics to interact with industry. They measure the "variety" of channels over a large database from a survey. Results show that interaction follows several channels. Individual characteristics matter more than department or university characteristics, as well as academic status.

More recently Grimpe & Hussinger (2013) discussed the various forms of Knowledge and Technology Transfer – formal and informal. To do so they exploit a wide database of German Firms. From the analysis of data they are able to conclude that a complementarity exists between formal and informal ways of Knowledge and Technology Transfer. "Informal" comprises those mechanisms not involving contractual forms, such as personal contracts.

Narrowing our perspective leads us to review works discussing the analysis of innovation policies in Italy. On this topic a first relevant contribution is that of Rolfo & Calabrese (2003). The different typologies of National and Regional policies for innovation targeted at SMEs are reviewed. Aids to firms for innovation were regulated by a plethora of laws. Notwithstanding the fact that a high fraction of companies did benefit of the policies, the opinion is generally negative. There is also a relation between absorptive capacity of companies and their internal organization. Finally, there is a substantial lack of infrastructural policies.

In two more recent works (Rolfo & Calabrese, 2006; 2006a) the two authors continue their analysis of Innovation policies, with a peculiar focus on Italy. In the first of the two articles a general overview on the history of innovation policies is offered. The most relevant points are the regionalization of policies and their insertion in systemic contexts. This work is completed by the second one of the two, which is more specifically addressed at the regionalization of R&D policies in the Italian context. After the analysis of the legislative context, National and Regional policies are reviewed. Concepts underlying Italian policy structure are in general traditional and old-fashioned, and concepts such as the Triple Helix are overlooked. This is also true at Regional level.

Some works also tackle the topic of the analysis of technology and knowledge transfer in the specific geographic area studied in this article. Rolfo and Finardi (2014) study the attitude of faculty from the two main Piedmont's Universities (University and Politecnico of Torino) towards Third mission activities. Their findings show that personnel from Politecnico (a Technological Engineering University) is more proactive towards third mission if compared with the generalist University. This could either depend from the research topics (engineering) or the internal environment. Also Bodas Freitas *et al.* (2012; 2013; 2013a) study several aspects of university-industry interactions in Piedmont. In the first of the three works (2012) a survey on Piedmont's firms is the basis to discuss the different models of interactions. Results suggest that "personal contractual interactions are as important as institutional arrangements and that both are complemented by informal contracts" (p. 41). The same database is exploited also in the two more recent papers (2013; 2013a). The latter of the two papers explores the influence of knowledge objectives in the decision of a firm to collaborate with research. Conclusions show that such objectives matter, and

"collaborations based on provision of business consulting are more likely to involve regional universities while collaborations focused on R&D and provision of testing and analysis services by the university are less likely to involve a regional university" (p. 17). In the former one, instead, authors exploit an econometric model to study institutional and personal contractual mode of university-industry interaction. The two forms are likely to have equal importance for the firms in the sample. Characteristics of the firms influence the form of collaboration.

The Technology Transfer activities of the institutes of CNR based in Piedmont are studied by Coccia and Rolfo (2004). The paper analyses the various channels of transfer, as well as the spatial distribution. Findings show a variety of channels driving knowledge out of the institutes.

Finally, Rolfo and Bonomi (2014) study a successful case of innovative cooperation. The case study shows the features of a structured inter-firms cooperation for the management of competitive projects.

3. INDUSTRY AND RESEARCH IN THE PROVINCE OF TORINO

The Province of Torino is one of the 8 Provinces of the Piedmont Region, situated in Northwest Italy. Its capital town is Torino, which is also the seat to the Regional government and the most important town of Piedmont.

According to Barazza (2014) the Province of Torino had in 2012 a population of 2,247,780 inhabitants. In 2011 it produced a gross added value of € 58,522.1 Million, and it hosted 234,499 firms. The disaggregate values of gross added value are € 349.9 Million for agriculture, € 14,964.2 Million industry and € 43,208.0 Million services. 10.2 % of companies were in the industrial sector. The most represented sectors were commerce (25.6 %) and services (24.1 %). Among industries the most represented is metallurgy (29.2 %), followed by wood and furniture (8.8 %), food & beverage (7.6 %), mechanics and textile & clothes (7.4 % each). More than half of the companies (53.4 %) were individual ones. Data for R&D expenses for all the Region (Piedmont) report an expense of 1.8 % of GDP in 2010, above the National average of 1.3 % but below the Europe-28 average of 2 %. 76.2 % of this value is industrial R&D.

The most relevant supply & production chains in the Region are Automotive, Aerospace, ICT, Mechatronics, Environment, Design. Agribusiness as a whole also presents a relevant number of firms, employees and GDP. A smaller but growing sector is that of biotech.

Coming to the system of public research in the Province of Torino, its main actors are the University of Torino, the Politecnico of Torino (both public Universities) and the CNR (National Research Council of Italy) Institutes having a seat in the Region[1]. University of Torino, founded in 1404, is a generalist University, which teaching and research in Arts & Humanities, Social Sciences, Hard and applied sciences and Medicine. It accounts for over 64,000 students as of 2012, and it has slightly more than 2,000 professors.

Politecnico of Torino, by its side, has been founded in 1859 as an application school for engineers. It is a technical University, as it presents only teaching and research in

[1] Data on research institutions have been retrieved on the respective Websites.

Engineering and Architecture. It has about 29,000 students as of 2012, and about 850 professors.

CNR, National Research Council of Italy, a public body, is the widest Italian research organization. It is organized in institutes, and some of them are located in the Province of Torino. Three institutes have their main seat in the Province as of end 2014: CERIS, Institute for Economic Research on Firms and Growth; IPSP, Institute for Sustainable Productions of Vegetables; IEIIT, Electronics and Telecommunications and Information Engineering Institute. Also other institutes have secondary seats in the Province.

All the three research institutions did take part into the studied project.

4. THE KNOWLEDGE TRANSFER PROJECT

The knowledge transfer project studied in the present work is called "PRO.TE.INN.", PROvincia TEcnologia INNovazione (Technology Innovation in the Province). It took place in the Province of Torino in 2006. Its main promoter has been the Council of the Province of Torino[2]. As said above it has been an initiative based on the transfer of "embodied knowledge". That is, it involved persons as media of technology transfer between a research institution and a innovating firm. Its aim was to ensure an active and efficient link between the two entities, acting as a connection in order to realize the transfer of knowledge. Moreover in this case the link was supposed to be an active link, able not only to transfer but also to generate knowledge in the transfer.

The target of the project was to contribute to innovation in SMEs through qualified human resources. In this way it enriched the competencies of young people, improving their skills and knowledge. Moreover it strategically met the needs of SMEs, the most relevant fraction of the industrial framework of the Province, helping to create channels with research labs.

One of the points of strength of PRO.TE.INN. has been a reduced management. The project was targeted only at SMEs having at least one seat (main or operational) in the Province of Torino. Firms did respond to a competition announcement, presenting a project for an innovative activity. This had to be compulsively performed with the collaboration of a young person (maximum 35 years old) holding at least a second-level (5-years) University degree. A steering committee, composed by representatives of all the promoters, selected a commission of experts and decided evaluation criteria for the projects. The commission in turn selected the projects according to the evaluation criteria. In every project the Department (either from University or Politecnico) or CNR the Institute that the firm was planning to involve in the project was named. Once selected the projects, every involved Department/Institute set out a call for the grant(s).

[2] PRO.TE.INN. has been promoted by the Province di Torino (main actor and main financing body), the Regione Piemonte, the Town of Turin and the Camera di Commercio, Industria, Artigianato e Agricoltura di Torino, with the organizing and coordination support of COREP. It was supported by several institutions: the Unione Industriale di Torino (Industrial League), API, association of SMEs of Torino, the three leagues of artisans Confartigianato, CASArtigiani and CNA, as well as by the University of Torino and the Politecnico di Torino. Compagnia di San Paolo also participated in the project giving financial support, financing five added grants for five added students.

PRO.TE.INN. financing did cover such grants, which were aimed at employing for one year (12 months) a graduate holding a (minimum) 5-years University degree. He/she had to collaborate with both the firm and the Department/Institute to perform the innovation project. Competing firms did finance 15 % of the grants (which were about € 20,000 each).

At the beginning of the project a survey was sent to participating firms in order to collect preliminary data. At the end of the project an evaluation survey was sent to the persons in charge of the projects in the firms, as well as to the grantees.

The survey was prepared by the FRAME laboratory of COREP (Regional Consortium for Permanent Eduation), which was in charge of the evaluation of the project.

In the surveys it was possible (thanks to the collaboration of FRAME) to insert specific sets of questions. These questions aimed at understanding the nature of the innovation projects and other relevant features as the following will show.

5. EXPERIMENTAL RESULTS.

In the context of PRO.TE.INN. 210 projects were presented by 177 firms. Out of these, 149 presented one project, 24 presented two projects, 3 presented 3 projects and 1 presented 4 projects. The vast majority of the firms (93.8%) had its main seat in Piedmont (91.0% in the Province of Turin). 65 project have been financed out of the 210. 93.0% of the 65 firms had the main seat in Piedmont (90.8 % in the province of Turin).

Tables 1 to 4 present some relevant data on the selected firms. Table 1 reports the industrial sectors of the firms; Table 2 shows the dimension of participating firms in terms of the number of employees; table 3 reports the turnover data of the firms; table 4 presents the data on the number of employees crossed with the year of foundation of the firm.

Table 1: industrial sectors of firms participating to PRO.TE.INN.

Sector	Firms
Manufacturing	23
Building	2
Transports and communications	1
Real estate, informatics, research	33
Health and social assistance	1
Other services (social and personal)	1
No data	4
TOTAL	65

Table 2: number of employees

Firm dimension	Number of firms
Micro enterprise (1 to 9 employees)	43
Small enterprise (10 to 49 employees)	20
Middle enterprise (50 to 249 employees)	1
No data	1
TOTAL	65

Table 3: turnover (in thousand €)

Turnover classes	Number of firms
Up to 50	9
From 50 to 150	7
From 150 to 500	13
From 500 to 1,000	9
From 1,000 to 5,000	13
From 5,000 to 10,000	5
More than 10,000	1
No data	8
TOTAL	65

Table 4: number of employees versus year of foundation

N° of employees vs. Year of foundation	1975 - 1990	1990 - 2000	2001 – 2004	2005 - 2006
0 - 9	3	4	4	22
10 - 50	6	1	0	0
51 - 250	0	2	0	1
TOTAL	9	7	4	23

Note: missing data add to 65

Most of the participating firms were micro or small enterprises of recent foundation. 22 firms out of 43 answering to the specific question are micro enterprises founded in the two previous years.

This fact suggests that a high fraction of participating firms were young Startups; it is possible that many of them were University Spinoffs.

Of the involved departments, the three most represented ones (two from the Politecnico, Informatics and Electronics, and one from the University, Electronics) account for 24 selected projects on 65. Data on firm sectors

show that 33 of them (more or less the half) deal with "Real estate, informatics, research". This suggests the presence of a strong bias towards informatics and electronics. 35 projects out of 65 did entail the presence of a grantee holding an Engineering degree.

The core dataset for the present work is based on a set of specific questions inserted for this purpose in the final evaluation survey thanks to the collaboration of FRAME laboratory. The survey was directed to all the actors involved in the projects: firms, departments, grantees. The main focus for this work has been the survey for participating firms (the person in charge of the answers was the technical responsible of the project or the owner). The firms answering to the survey have been 57. A first set of specific questions aimed at investigating the firms in terms of its previous innovation activities. The questions are:

- Does the firm have a reference person for R&D and innovation?
- Which fraction of the firm's turnover is devoted to R&D and innovation?
- Is the firm part of any firms' network aiming at innovation?
- Has the firm received in the last 5 years any financing for research, development and innovation?

Tables 5 to 8 present the answers to the four questions. It is easily seen that most firms have an internal R&D reference person ad devote a high fraction of turnover (more than 5 %) to R&D.

More than half of the answering firms did receive external financing (e.g. participation to competitive projects). These facts contribute to the above expressed hypothesis that many of the firms are spinoffs from research.

Table 5 – Does the firm have a reference person for R&D and innovation?

Answer	Number of firms
No	16
Yes	41

Table 6 – Which fraction of the turnover is devoted to R&D and innovation?

% of turnover in R&D	Number of firms
Less than 1 %	2
Between 1 and 2 %	1
Between 2 and 5 %	10
More than 5 %	39
Do not know	5

Table 7 – Is the firm part of any firms' network aiming at innovation?

Answer	Number of firms
No	36
Yes	21

Table 8 – Has the firm received in the last 5 years any financing for research, development and innovation?

Answer	Number of firms
No	26
Yes	31

The second set of questions aims at describing the type of innovation and the effectiveness of the presence of the grantee in the firm:

- How would you define your project: "Product technological innovation", "Process technological innovation" or "Non technological innovation"?
- Product technological innovation is about: "New product" or "Improvement of existing product"?
- Non technological innovation is about: "Market innovation/new commercial strategies" or "Organization/management innovation"?
- What does innovation mostly need to be realized: "The strengthening of technologies that are yet present in the firm" or "The development of new competencies"?
- Would the firm have realized the innovative project also without the presence of the grantee?

This second set of question aimed at evaluating the innovation brought in to the firm by means of the project. The questions try to evaluate the type of innovation – product/process, radical/incremental, technological/organizational. The aim is to evaluate the role, contribution and effectiveness of the grantee in connecting the Department/Institute and the firm. The connection is here intended as effectiveness in acting as a medium for the transfer of knowledge between the two entities. Tables 9 – 13 report the answers to the questions.

Data show that most part of the innovation projects (37 out of 57 answers) were product technological innovations; 19 out of 57 did deal with process innovations. Out of the 37 product innovations sought by the firms, 26 (more than two-thirds) dealt with new products, and could thus be regarded as "radical".

The remaining, aiming at the improvement of an existing product, have rather the character of "incremental" innovation. The only non-technological innovation was about a market/commercial strategy innovation. The radical character of most sought-for innovations is witnessed also by the results presented in table 12, showing that most

innovations (40 out of 57) need the development of new expertise in the firm to be realized. Among expected benefits, besides obvious market benefits, the second share is that of technical benefits for the firm.

Table 13 presents the answer to the question at the core of the present work, "Would the firm have realized the innovation project also without the presence of the grantee?". The question is aimed at testing the effectiveness of the grantee as "instrument" for the transfer of knowledge in the collaboration between the firm and the Department/Institute". The answers are rather symmetric. In fact 16 firms responded "No", 25 "In part only" and another 16 "Yes".

Table 9 – How would you define your project?

Answer	Number of firms
Product technological innovation	37
Process technological innovation	19
Non technological innovation	1

Table 10 – Product technological innovation is about…

Answer	Number of firms
New product	26
Improvement of an existing product	11

Table 11 – Non technological innovation is about…

Answer	Number of firms
Market innovation/new commercial strategies	1
Organization/management innovation	0

Table 12 – What does innovation need mostly to be realized?

Answer	Number of firms
The strengthening of technologies that are yet present in the firm	17
The development of new expertise	40

Table 13 – Would the firm have realized the innovation project also without the presence of the grantee?

Answer	Number of firms
No	16
In part only	25
Yes	16

In order to better highlight the contribution of the grantees to the innovative activities of the firm deriving from the project, answers to the last question have been crossed with other relevant data. Results are reported in tables 14-17. Table 14 crosses data with those on the presence of an R&D/Innovation reference person in the firm. In this case the share of "In part only" is higher for those firms who do not have such figure among their staff. Thus it might seem that some – but no determinant – effect of the presence of the grantee might be envisaged in less-R&D-intensive firms. A similar and slightly more pronounced effect is present (table 15) in micro firms.

Table 16 crosses the data on the role of the grantee with those of the type (Product/process/non technological) of innovation. 9 firms seeking product technological innovations out of 37 (less than 25 %) deemed essential the presence of the grantee for realizing the innovation. This effect is moderated in process technological innovations, though in this case we have only 19 firms answering to the survey. Finally, when coming to the cases of "radical/incremental" innovations the trends are similar to those above described for the more general case of product technological innovations.

Table 14 – Would the firm have realized the innovative project also without the presence of the grantee? Relation with "does the firm have a reference person for innovation/R&D?"

	Does the firm have a reference person for innovation/R&D?		Total
	No	Yes	
No	4	12	16
In part only	10	15	25
Yes	2	14	16
Total	16	41	57

Table 15 – Would the firm have realized the innovative project also without the presence of the grantee? Relation with "number of employees".

	Number of employees			Total
	Micro (1 to 9)	Small (10 to 49)	Medium (50 to 249)	
No	11	4	1	16
In part only	20	5	0	25
Yes	9	7	0	16
Total	40	16	1	56

Table 16 – Would the firm have realized the innovative project also without the presence of the grantee? Relation with "how would you define your project?"

	How would you define your innovation project?			Total
	Product technological	Process technological	Non technological	
No	9	6	1	16
In part only	16	9	0	25
Yes	12	4	0	16
Total	37	19	1	57

Table 17 – Would the firm have realized the innovative project also without the presence of the grantee? Relation with "product technological innovation is about"

	Product technological innovation is about		Total
	New product	Improvement of existing product	
No	7	2	9
In part only	11	5	16
Yes	8	4	12
Total	26	11	37

Some further questions in the survey did entail a more general evaluation of the role of the Department/Institute, than of the grantee:

- How do you evaluate the contribution of the Department?
- Will you continue the cooperation with the Department?

Results are presented in tables 18 and 19. Data show that in general the grade of satisfaction of firms towards Departments is high. Only few firms have been disappointed by the collaboration, and most have continued collaborating with the Department/Institute that was involved in the project.

Table 18 – How do you evaluate the contribution of the Department?

Answer	Number of firms
Scarcely appropriate	1
Only partly appropriate	3
Appropriate	53

Table 19 – Will you continue the cooperation with the Department?

Answer	Number of firms
No	4
The collaboration is being defined	9
Yes	35
No answer	9

Finally, two questions from the grantees' survey can shed further light in the present context. They are:

- How do you evaluate the participation to PRO.TE.INN.?
- Which role did you have in the project?

Results are presented in tables 20 and 21. The rate of satisfaction of the grantees is rather high. Data in table 21 show that in almost half of the firms the grantee has been integrated as member of an existing team. It is then possible that this has hindered in some way his role as a knowledge transfer medium between the research institution and the firm. It is also possible that grantees have been offered a sort of mid-executive role in the group, thus performing some specific tasks in the project (thus lifting the level of personal satisfaction) but basically hindering the true role the grantee was targeted at.

Table 20 – How do you evaluate the participation to PRO.TE.INN.?

Answer	Percent
Unuseful	7
Useful	93

Table 21 – Which role did you have in the project?

Answer	Percent
Merely executive	9
Sole performer of the project	28
Co-responsible of the project	13
Member of an existing team	48
Other	2

6. CONCLUSIONS AND LEARNED LESSONS.

Aim of the present work is to shed light on the efficiency of embodied knowledge transfer, defined as the transfer of knowledge between research and firms performed with the aid of one (or more) person working as a relay. This person connects the two entities, and thus is the medium of this transfer.

The article tries to do so exploiting a specific case study: it is based in fact on the data of a knowledge transfer project carried out in the Province of Torino (Piedmont, Northwestern Italy) in 2006-2007. The project was mostly supported by the Council of the Province, and did finance grants for young persons in possess of a (minimum) 5-years University degree. Firms did participate presenting an innovation project which should have unrolled with the collaboration of a University department or a CNR Institute. Grantees had the role of relays between the firm and the Department/Institute, thus behaving as embodied knowledge transfer media.

Evaluation of the project was performed with a number of surveys. At the beginning of the project a first survey collected data on the firms and on their previous innovative activities. At the end of the project a second survey did collect data on the nature and the outcome of the projects, and on the level of satisfaction of firms and grantees.

Data from the first survey and from the analysis of the projects show that most part of the participants were young micro enterprises, having been founded only in the two years previous to the project. Notwithstanding (or probably because) these facts, most firms were rather proactive towards R&D and innovation, as data show. In most firms an R&D and innovation operator is present, and most firms spend in R&D more than 5 % of their turnover. As said above in the theoretical framework, absorptive capacity of the firms is not measured with precision in the present work. Nevertheless these data allow thinking that this capacity should in most cases be rather pronounced, given the relevant (and much above the average, as section 3 shows) investment in R&D.

Data from the second survey first of all shed light on the nature of the projects. Most of them are described as “Product technological innovations”, then another group are “Process technological innovations” (about half of the former), and only one as a “Non technological innovation”. In the first group more than two thirds are “New products”, that is, in principle a radical innovation. Moreover more than two thirds of the *total* of the projects requires “The development of new expertise” rather than “The strengthening of technologies that are yet present in the firm”. Thus the group of firms participating in the project is mainly composed of young micro enterprises aiming at the development of a new product developing new internal expertise.

To test the effectiveness of the grantee as medium of knowledge transfer it has been asked to the firms (the person in charge of the project did answer to the survey) if the firm would have realized the project also without the presence of the grantee.

The results are mixed: 16 answered “no”, 25 “in part only” and 16 “yes”. Thus in about 29 % of the cases the contribution of the grantee has been deemed as totally non-critical. In the other cases the presence of the grantee has been at least partly decisive for the innovation project.

Slight differences exist between firms and projects of different kind. The role of the grantee has been slightly more critical for micro firms, and for firms *without* an R&D/Innovation reference person. It has instead slightly *less* critical for product technological innovation.

Thus, inferring from the above described data, it is possible to say that in a specific context the presence of a person that, in principle, should be able to connect research institutions and firms in terms of knowledge transfer can be determinant to realize an innovative process.

Some caveats should be taken in account in the context of the present analysis, and are first of all related to the above defined "specific context". That is, the case study is relative to a group of firms that is mainly composed of subjects that are: highly R&D intensive, small and young. The characters of this group perfectly fit that of a group of recently formed Spinoffs, possibly academic. Such Spinoffs might still have had links with a research institution. As above described a group with this composition feasibly presents a pronounced absorptive capacity, making it easier to profit of links (of any kind) with basic or applied research. This composition of the sample in turn might depend from a selection bias determined by the nature of the project itself. In fact firms have been selected on the basis of the quality of the project. Though criteria for the choice haven't been disclosed, it is possible to imagine that, besides feasibility, criteria probably entailed the scientific-technological level of the project. This gives hi-tech Spinoffs a relevant competitive advantage.

A further caveat is relative to the personal qualities of grantees, and should also be regarded as a more general caveat towards embodied knowledge transfer. That is, though grantees have been selected in all cases through a competitive examination, not all the characteristics might have been carefully screened. Thus the presence of subjects which did no perfectly fit the role of "knowledge media" might have (in general as well as in the specific case) a negative impact. On the other side, the grantees' answers on their role in the advancement of the project cast a shadow on the ability of firms to fully exploit their potential in knowledge transfer. In fact having been member of a preexisting team (as in most cases) might have at least partly hindered the strength of their Scientific & Technical human capital for the good outcome of the knowledge transfer in the project.

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Working Paper Cnr-Ceris

ISSN (*print*): 1591-0709 ISSN (*on line*): 2036-8216

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