INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 9, Issue 3, (2019) E-ISSN: 2222-6990

Technological Transfer in Italy: From University to the Industry: Brief Analysis

Antonella Laino
University E-Campus, Como, Italy
Email: Antonella.laino@uniecampus.it

To Link this Article: http://dx.doi.org/10.6007/IJARBSS/v9-i3/5645 DOI:10.6007/IJARBSS/v9-i3/5645

Published Date: 10 April 2019

Abstract
The knowledge-based economy imposes new competitive challenges on companies and all institutions that contribute to the growth and development of a country. In this new scenario it becomes essential to establish relationships between different institutions, such as companies, universities and research centers to develop innovation in synergy. Innovation is the result of the research that is carried out, above all in the fragmented Italian business landscape, essentially by universities and public research centers. Precisely for this reason it is necessary to have a dialogue between the academic world and the business world in order to activate the technology transfer, essential to make the knowledge functional to the economic exploitation. The policies of support to innovation, engine of growth and development, foresee the activation of many tools that have taken the shape of technology transfer offices, business incubators and university spin-offs. Statistical surveys conducted at the Italian university system level show encouraging and positive data on the development of these tools.
Keywords: Technology Transfer, Knowledge Economy, Scientific Research, University Incubators, Spin-Off

Introduction

By fostering an economy based on knowledge, innovation and competitiveness derive increasingly from basic research and, therefore, from the ability of universities and companies to cooperate and collaborate. The exploitation of knowledge has become a foundational asset for assessing the competitiveness of a country, and growth policies increasingly emphasize the crucial role of intangible resources, such as skills and innovative ideas. In this context, technology transfer is a very important activity to pursue objectives of economic and social progress (Villani, 2018).

The University is today called to play a key role in society and moves within a system represented by the knowledge based economy (Geuna, Muscio, 2009). The academic institution remains the primary place of training and learning, but it also becomes a place for highly specialized professional training, placing itself at the center of a knowledge generation

and circulation system in which it is called to transfer and commercialize knowledge (Etzkowitz, Leydesrff, 2000). Relations between the world of science and the productive world assume an increasingly central role in the competitiveness of the industrial system, and research institutions and universities are called to contribute directly to the development of the country (EtzKowitz, 2004).

Technology transfer is one of the most relevant aspects of the third university mission. The third mission concerns the economic exploitation of knowledge with the aim of promoting economic growth by transforming the knowledge produced by research into knowledge that can be used for production purposes. This includes the management of intellectual property, the creation of businesses, the search for third parties and the management of support and brokerage structures.
In other words, the third mission is the set of activities with which the universities interact with society, supporting teaching (first mission) and research (second mission). With the third mission, the universities come into contact with other subjects than the 'traditional' ones. In Italy the concept of university opening to the economic and social context in which they operate has been introduced, and a "third mission" has been assigned to them starting from the research evaluation document (VQR) 2004-2010 (anvur).

The idea behind technology transfer is the assumption that research results can be validly absorbed by the industrial system, to develop innovative products and services. Technological transfer is influenced by many factors such as the availability of research staff to be involved in the activity, the commercial and industrial potential of the research results, the geographical and cognitive proximity of companies able to 'absorb' the academic research, the possibility of absorption by the market of innovations resulting from academic research, the possibility of patenting research results, incentives for involvement in a technology transfer activity (Cicchetti, Leone, Mascia, 2007). For a university, technology transfer activities can lead to significant advantages, even of an immediate economic nature, to support further research, even though licensing activities and the creation of spin-offs do not always determine direct revenues. In this regard, however, it is necessary to remember that the goal of the university is always to create knowledge to apply it to industrial development rather than the creation of revenues. However, technology transfer activities can create industrial repercussions that attract companies in the area, stimulating further innovation, giving rise to a sort of collaborative research activity (Barbieri, Rubini, Micozzi, 2014).

The relationship between industry and academy has considerable advantages. This relationship can increase and enhance the resources available and increase the funds to be dedicated to research projects. The resources may derive from private research funding and the resulting economic returns of the discoveries, in the form of patents and property rights. From the point of view of research perspectives, one can also obtain advantages: the collaboration between the academic world and the industrial world allows research staff to access industrial information that can stimulate research paths that are more driven towards empiricism. On the other hand, it should be noted that the collaboration relationships between universities and companies can direct academic research towards applied research, rather than basic research, which is fundamental and is not generally cultivated in private research, as it is very expensive and uncertain in the results. It is precisely the universities and public research centers that have to support basic research where the social payoff is very

high. With this in mind, being able to access financial sources of an industrial nature could create pressure, and detract from the innate objectives of the Universities. When opening up to private industrial sponsors, the traditional opening of the academy towards the dissemination and of results is held back by the need for greater confidentiality and the tendency to protect results.

In other words, collaboration between industry and University is necessary, but we must try to minimize the conditioning that this relationship entails. It is useful to mention that the tendency in recent years to 'enslave' scientific research to improve competitiveness can create distortions in university activity. In some cases we have come to talk about 'entrepreneurial university' which become such when ‘they are unafraid to maximize the potential for commercialization of their ideas and create value in society and do not see this as a significant threat to academic value (Clark, 1998). In other words, reference is made to a university that does not have the sole purpose of producing new knowledge, but also of spreading this knowledge to the outside world (Guerreo & Urbano, 2012).
Part of the literature takes a critical position with respect to this trend and the inclusion of the third mission among those that the University must bear(Bok, 2003) based on the assumption that there is a "genetic" conflict for the researcher between the mission research and commitment to commercial exploitation of scientific results. But these themes, although very interesting, go beyond the objective of this work.

TOOLS TO PROMOTE RESEARCH IN ITALY

The policies to support scientific research and innovation in Italy have been realized in the creation of complex instruments that focus on the aggregation of institutions and research centers, to improve efficiency and synergy in the use of public, community and private funds. (Balderi, Daniele & Piccalunga, 2012).
In summary the tools used are:

- National Technology Platforms, which promote collaboration between public administrations, the public and private research system, and businesses. These structures identify medium and long-term technological development scenarios, in addition to specifying relevant research areas. The Platforms are led by subjects from the industrial and production world. They represent organized aggregative structures that bring together industrial, scientific and institutional operators. - They do not manage economic resources and are not legal entities: they have the sole objective of approving industrial policy documents in the field of new technologies and research. The Italian technological platforms, in other words, are facilitators and integrators of the system. (Magni, Noè, 2019). In this regard, we can cite the example of the national photonic technology platform (CORIFI, Coordination of Italian photonic innovation research) which aims the coordination and representation of the requests coming from the national photonic community, both industrial and academic, confronting the European technological platform. The priority purpose of this platform is to define a unified national strategy, while at the same time improving Italy's ability to acquire EU funds through active participation in Horizon 2020 calls.
- High-tech districts, i.e. aggregations at a territorial level between research centers, universities and companies, coordinated by a specific governing body, to stimulate cooperation and synergies in a defined field of specialization, such as genetic technologies, energy, materials, information, environment. These structures are

called to build integrated systems of research, innovation and training, in order to be the drivers of sustainable economic growth. (Checcacci, Costone, Finocchietti & Foroni, 2012). There are examples of the Advanced Materials Technology District born at the end of 2003 in Lombardy and the ICT & Security Technological District born in 2005 in Tuscany.

- The poles of excellence that group and link on a defined technological frontier the skills and structures managed by consortia of companies, universities, research institutions and other public and private partners, encouraging the common use of resources, installations, exchange of knowledge, dissemination of information (Balconi & Passannanti, 2006)
- The joint public-private laboratories, which aim to direct the scientific and technological skills of public research towards industrial developments. In this case the public sector provides the expertise of the research groups and the private partner supports the costs of structural investments and partially the costs of research management
- Clusters, which are groupings of businesses, economic operators and research institutions territorially contiguous that have reached a company size sufficient to support research, training, specific skills in a specific sector and are, eventually, also able to manage the scientific parks. They present themselves as open and inclusive networks, each of which focuses on a specific technological and application sphere considered strategic for the country. The goal of the clusters is to develop the network economy, identify and exploit synergies and improve the competitiveness of the territory. In 2012 the Ministry of Education, University and Research issued a call for the development and strengthening of National Technological Clusters, which must aim at creating interactions between the industrial system, the research system and national and regional institutions, to support national strategies for research, development and training of human capital. In other words, they are tools for coordinating the strategic technological areas of the Italian system (Bottinelli & Pavione, 2011). An example is CTNA, a National Aerospace Technological Cluster that aggregates the main players in the Italian aerospace system

UNIVERSITY AND INDUSTRY: TWO WORLDS COMPARED

The university world and the industrial world are very different from each other, but these differences, if properly exploited, can give rise to unthinkable synergies. (Rolfo, Finardi, 2014). First of all, it is possible to highlight differences in the objectives pursued since the academic world is oriented to developing knowledge and disseminating it as widely as possible and the researcher is often a monodisciplinary operator who focuses on research activities for a long time. If we think of the academic community, we see that the priority of this is the dissemination of research through publication in quality scientific journals, participation in international conferences, obtaining peer-reviewed scientific awards (Thornton, Ocasio, Lounsbury, 2012).

The acquisition of knowledge takes place largely through the work of the scientific community in which rules in force are partially different from the market. The scientific community is nurtured by incentive mechanisms of a nature that is not only and specifically economic, and this leads to the diffusion of results rather than protection from imitations, as happens in the industrial world.

The basic research, which distinguishes the university world, is dominated by the logic of freedom, which implies a high degree of discretion on the part of researchers in the choice of topics to be treated and the approaches to be followed in research. (Foray, 2004) On the contrary, applied research, which distinguishes the business environment, is driven by interest in the company's core business, implying limited freedom and discretion for company researchers. Who operates in a business context, is oriented to an industrial use of knowledge, works on interdisciplinary problems, must take decisions on short time horizons and is active on a limited number of functions. It is focused on learning that knowledge that can be exploited for competitive purposes (Bruneel, D'Este, Salter, 2010). The dominant logic in the business environment is, therefore, characterized by the importance of evaluating the commercial potential of research, i.e. capacity that this has to generate income flows in a short time. The basis of company research is the need to avoid disclosure of results to foster the secrecy and internal exploitation of knowledge (Gans, Murray, Stern, 2013). And of different nature is the 'treated' knowledge: in the university world, and research in general, reference is made to codified knowledge, that is, that part of knowledge that can be transferred from one subject to another through a formal language, in the face of a tacit knowledge, and not codified, proper to the industrial world, which is rooted in behavior, in the action exercised in a given context. From this point of view, in the activation phase of the relationship between University and business, a work of translation of knowledge for absorption by the industrial world is necessary, so that it is integrated into the company processes (Foray, 2004).

TECHNOLOGY TRANSFER OFFICES (TTO)

To overcome the obvious differences that exist between the academic world and the industrial system and to try to 'translate' academic knowledge into applied knowledge to industry, allowing a constructive dialogue between two seemingly very distant realities, making the technology transfer process more fluid, technology transfer offices (TTO), technology science parks and business incubators were created (Balderi, Daniele, Piccalunga, 2012). In fact, the realization of a complete technological transfer requires organizations appointed for this, in which there are, and develop, multi-professionalism.

In reality, the relationship between technical universities and industry is a long-term relationship, because the research activity that is carried out is more immediate than transferred to the company, even if this process is not easy to implement in a country like 'Italy which presents a very pulverized industrial fabric, characterized by the presence of many small companies, structurally incapable of carrying out an organic research activity and, therefore, in difficulty in the encounter with the world of institutional research.

The enhancement of academic research through technology transfer to the industrial world, and in general the collaboration between industry and academy is constantly growing in Italian universities (CRUI, 2015) but there are many problems related to different purposes that industry and university world they arise: as mentioned, the academic world develops and disseminates knowledge of an explicit and codified nature and operates on medium-long temporal arcs, while the industrial sector is oriented towards the use of knowledge, operating in interdisciplinary contexts, with short-term investments, and develops tacit knowledge. Therefore, mediation between distant worlds is necessary and this function can be validly carried out by the technology transfer offices.

The first TTOs in Italy were created at the beginning of the 2000s, and they achieved uncertain results, not having a previous organizational module to be inspired. The first and fundamental

activity of the offices is to monitor inventions, encouraging researchers to systematically communicate their inventions (Siegel *et al.,* 2003)
Once the invention has been formally identified, the office assesses its potential for industrial exploitation by deciding whether to patent the discovery. Often the sole interest of a company is sufficient justification for the patent application. In this context the TTOs play an important role in proposing inventions already mature to have an industrial application, but which have yet to be translated into a real business idea, to potentially interested companies. Furthermore, TTOs can facilitate the diffusion of technology developed through the transfer of licenses and patents to companies. The exploitation of research results, the primary purpose of TTOs, requires a well-defined marketing strategy (Piccalunga & Rosato, 2006).

The strategies to facilitate the match between supply and demand for industrial property can be different depending on whether the initiative comes from the demand side, that is the firm, or from the supply side, that is the academic world. In the latter case, it is the universities, or research centers, that promote the results of their research. This implies a strong work of managing the network by TTOs in order to have contacts to which to offer the technology. The alternative approach, in which companies recognize their technological needs, is more difficult to implement, at least in Italy, given the natural difficulty of small businesses to recognize the need for innovation and research, even if these organizations represent, probably, the ideal interlocutors as they particularly need partnerships to develop technology.

At the end of 2018 there were 56 TTOs in Italy, and it can be estimated that all universities and public research institutions have a structure dedicated to technology transfer. In 96% of the cases the offices are inside the university. 100% of the TTOs are involved in creating spin-offs, as well as intellectual property management and licensing activities. 40.7% of the TTO include, or participate in, a scientific park and 55.9% to an incubator. In 98.2% of the cases the activities that TTO perform most frequently are the creation of spin-offs and industrial collaboration for the conduct of contract research. (Netval.). The average number of patents in the portfolio is about 71 patents. If we compare these data with what emerges at the European level we see that in terms of productivity, estimated through the number of spin-offs created, Italy is perfectly in line with the other European universities (ASTP-Proton. 2015).

The main objectives that the TTO aim to achieve relate to the exploitation of research results and the creation of additional resources to devote to the development of other research projects. Secondly, they aim to generate repercussions on the local economy; ultimately generate revenues for academic staff. So, the offices in question focus on the economic value of the results of scientific and technological research, as well as the dissemination of an entrepreneurial culture of research, the support of spin-offs, and the support of the complex patenting process.
The exploitation of research results is typically obtained through licensing, the spin-off, that is, the granting of a patent or know-how license and the creation of a new company based on the wealth of knowledge developed by researchers. In the management of intellectual property, the TTOs support the invention process and the enhancement of this resource, in all phases, until the patent is obtained, which represents the instrument through which the technology transfer is carried out.

Recently, the phenomenon of aggregation of the TTOs of the single universities is often witnessed, with specific agreements regarding the areas of collaboration and spinning off processes of these offices and of the competences. We are therefore moving towards the identification of an efficient minimum scale that allows a correct approach to the market and a synergy and complementarity of the available resources, so as to develop these transfer organizations.

UNIVERSITY INCUBATORS

The European Commission (European Commission, 2002) defines a business incubator as an organization that makes systematic the process of creating new businesses by providing them with a wide range of integrated support services that include the physical spaces of the incubator, the business development support services and opportunities for integration and networking.

Business incubators are born with the aim of encouraging the birth of ecosystems favorable to the development of innovative start-ups. The university incubators began to spread in Italy in the late nineties, and many of these structures have links with universities or research institutes (Auricchio et al, 2013).

University incubators tend to be supported by public resources and more and more develop not only basic services for the provision of infrastructures and spaces in equipped areas and the provision of administrative services, but also more sophisticated services such as mentoring, training and specialist advice. Support for the birth and initial accompaniment of the start-up is the most widespread model. The PoliHub, the incubator of the Milan Polytechnic Foundation in 2018, represented the third university incubator in the world. Starting in 2003 there is a network between university incubators in Italy, PNICube born from the willingness of the Ministry of Production Activities to finance a project, IUNet to create a network linking the incubators of university enterprises. According to PNICube data, about 40 Italian universities have an incubator and it is estimated that these incubators generate more successful companies than others. According to PINCube data, the companies 'assisted' by the incubators have an average turnover greater than 25% compared to innovative companies that do not make use of this collaboration. This advantage is due to the fact that these start-ups, coming from the research world, have a technological and innovative base much more solid than the others (Auricchio et al, 2013).

Three generations of incubators are recognizable from the analysis of incubator development dynamics: first, second and third generation incubators(Colombo, Piva, Rentocchi, 2012) First generation incubators play the role of allocators of equipped spaces and shared equipment. The costs, but also the values, referred to this kind of structures are low. For the incubated company, the advantage consists in the saving of structural costs, which are achieved thanks to economies of scale that the incubator realizes through the joint use by several start-ups of the same structures (Grimaldi & Grandi, 2005).

The second-generation incubators, in addition to the objectives indicated above, have the will to contribute to the success of the start-ups by providing specialized consultants and specialized services in the various areas of business activities. They emerge at the end of the eighties as a strategic tool for the pursuit of greater economic growth, even though many have gone bankrupt because of lack of entrepreneurial skills and business experience (Bruneel

et al., 2012) in this phase we assist to an evolution with the integration of 'knowledge based' services as assistance in the formation of the business plan, organizational, managerial and market consultancy.

Finally, third generation incubators are characterized by the high specialization of support services for market access and cooperation in clusters and networks. These structures aim to generate value through the growth and success of the companies they support. Starting from the second half of the nineties, the importance of networking as an instrument able to develop the incubated companies is affirmed in this regard. Exploiting networking relationships means facilitating relationships between companies, customers, suppliers, strategic partners and investors (Scillitoe, Chakrabart, 2010). Incubators can be classified on the basis of three main characters (Mian, 2011): control methods, profit orientation and level of specialization.

Depending on the control methods, public or private incubators are distinguished. Public management incubators aim at job creation, support of the local economic context, technology transfer, exploitation of research results, promotion of specific industrial sectors. Increasingly, however, management is mixed, with the participation of public and private entities.
In terms of profit orientation, we distinguish not for profit and profit oriented incubators. Not for profit incubators are generalist, born on a public initiative and even funding is mostly public. University incubators usually do not have profit pressures, but focus their efforts on serving the university scientific community.

Theoretically, incubators of this type show a physiological imbalance between revenues deriving from incubation services and operating costs of the structure. The profit oriented incubators are oriented towards obtaining positive economic results; therefore the services are functional to investments and to the potential surplus deriving from the incubated companies. Finally, on the basis of the degree of specialization, we distinguish the specialized incubators, therefore aimed at supporting companies in a given field, and multipurpose incubators, which operate in different industrial sectors.

UNIVERSITY SPIN-OFFS

Companies with a high technological content are essential in the age of the knowledge economy, where innovation and technological progress is the real engine of global competitiveness. The university spin-off is activated thanks to the invention of a group of researchers. A spin off company is a juridically different entity from the starting institution, University or research center, which operates in high tech sectors and consists of at least one researcher or PhD student related to the invention.

This enterprise is based on a know-how, which can be patented, generated by the invention. This is a technological transfer tool that allows moving from the laboratory to the market, favoring the systemization of resources and skills thanks to collaboration between the University and private capital. Through the establishment of the spin-off l, the University can be part of the share capital and receive a dividend income or, alternatively, not be part of the share capital but obtain a return through the payment of royalties due to a license of the technology. The university spin-off is often created by a TTO to start a process of economic

growth on the territory, through the transfer of innovations to existing companies allowing the creation of a highly qualified workforce. In many cases, the university spin-off represents an instrument for the valorization of research results that would otherwise not reach the market. Often the spin-off makes use of the TTO support also in the post-birth phase, to grow and develop, for example by becoming part of incubation processes (Fryges & Wright, 2014).

In Italy at the end of 2018 there were 1373 spin-off companies and about 80% were established in the last 10 years. The survival rate is very high, even if the phenomenon is mostly concentrated in the Center-North: 47.3% of the identified companies are located in northern Italy, the Center hosts 29% and the South and the islands the 23.7%. The largest number of spin-offs is located in Tuscany (12.1%), followed by Lombardy (10.1%) and Piedmont 9.5%. 22.1% work in the ICT field, even if the relative weight of the sector has progressively decreased and the number of companies engaged in the innovation services sector has increased, 26.4%, energy and environment 16.7% and life science 15.3%. However, it is confirmed as a common feature of all Italian spin-offs: these are companies mainly engaged in the provision of services, or in any case of intangible assets rather than industrial ones (Netval).

It is worth mentioning the fact that for some years the need to improve the enterprise dimension of university spin-offs, which are very small, almost abandoned and without a long-term growth strategy, is strongly felt, with many cases of duplication, and poor financing (Piccalunga, 2013).

References

- Balconi, M., & Passannanti, A. (2006). *I parchi scientifici e tecnologici nel Nord Italia*. Milan: Franco Angeli.
- Balderi, C., Daniele, C., & Piccalunga, A. (2012). Gli uffici di trasferimento tecnologico delle università italiane: numeri man on solo numeri'. *Economia e Politica Industriale,* 39(4), 265-298.
- Barbieri, E., Rubini, L. & Micozzi, A. (2014). Evaluating policies for innovation and university-firm relations. An investigation on the attitude of Italian academic entrepreneurs towards collaborations with firms*. Journal of Applied Economics,* 32(2), 17-45.
- Bax, A., Corrieri, S., Daniele, C., Guarnieri, L., Parente, R., Piccalunga, A., Ramaciotti, L. & Tiezzi, R. (2014). *Unire i punti per completare il disegno dell'innovazione* . Undicesimo rapporto Netval,. Lucca: Maria Pacini Fazzi.
- Bok, D. (2003*). Universities in the marketplace. The commercialization of higher education*. Princeton: Princenton University Press.
- Bottinelli, L. & Pavione, E. (2011).*Distretti industriali e cluster tecnologici. Strategie emergenti di valorizzazione della ricerca e dell'innovazione*. Milan: Giuffrè.
- Bruneel, J., D'Este, P. & Salter, A. (2010). Investigating the factors that diminish the barriers to university-industry collaboration, *Research Policy* 39(7), 858-868.
- Bruneel, J., Bart, C., Ratinho, T. & Groen, A.J. (2012). The evolution of business incubators: comparing demand and supply of business incubation services across different incubator generations, *Technovation* ,32(2), 110-121.

- Checcacci, C., Costone, M., Finocchietti, C. & Foroni, M. (2012). *Federalismo Universitario. Le relazioni tra Regioni, Università. Esperienze in Italia, Germani e Spagna.* Rome: Apes.
- Cicchetti, A., Leone, F.E. & Mascia, D. (2007). *Ricerca scientifica e trasferimento tecnologico*. Milan: Franco Angeli.
- Clar, B.R. (1998). *Creating Entrepreneurial Universities. Organizational pathways of transformation.*New York,: Pergamon Press.
- Colombo, M.G., Piva, E. & Rentocchini, F. (2012). The effects of incubation on academic and nonacademic higher-tech start-ups: evidence from Italy . *Economics of Innovation and New Technology,* 21(5-6), 505-527.
- Etzkowitz, H., Leydesdorff, L. (2000). *Universities and the global knowledge economy: A triple helix of university-industry-government relation.* London: Pinter.
- EtzKowitz, H. (2004). Anatomy of the entrepreneurial university. *Social Science Information*, 52(3), 486-511.
- Foray, D. (2004*). Economics of Knowledge*. Cambridge: MIT Press.
- Fryges, H. & Wright, M. (2014). The origin of spin-offs: a typology of corporate and academic spin-offs. *Small Business Economics*, 43(2), 245-259.
- Gans, J.S., Murray, F.E. & Stern, S. (2013). Contracting over the disclosure of scientific knowledge: intellectual property and academic publication , NBER wp 19560
- Geuna, A. & Muscio, A. (2009). The governance of university knowledge transfer: A critical review of the literature. *Minerva,* 47(1), 93-114.
- Guerrero, M., & Urbano, D. (2012). The development of entrepreneurial university. *Journal of Technology Transfer,* 37(1), 43-74.
- Magni, A. & Noè, C. (2019). *Innovazione e sostenibilità nell'industria tessile*. Milan: Guerini e Associati.
- Piccalunga, A. & Rosato. A. (2006*). I nuovi marketing*. Milan: Franco Angeli.
- Piccalunga, A., (2013). Le imprese spin-off della ricerca in Italia: che fare dopo le prime mille?. *Sinergie* CUEIM Università degli studi Federico II, workshop Technology Venturing: www.sinergiejounal.it
- Rolfo, S. & Finardi, U. (2014). University Third mission in Italy: organization, faculty attitude and academic specialization. *The Journal of Technology Transfer,* 39(3), 472-486.
- Mian, S.A., (2011). University's involvement in technology business incubation: what theory and practice tell us. *International Journal Entrepreneurship and Innovation Management*, 13(2), 113-121.
- Scillitoe, J.L. & Chakrabart, A.K. (2010). The role of incubator interactions in assisting new ventures. *Technovation,* 30, 155-167.
- Siegel, D.S., Waldman, D. & Link, A., (2003).Assessing the impact of organizational practices on the relative productivity of university technology transfer offices: an exploratory study. *Research Policy,* 32(1), 27-48.
- Thornton, P.H., Ocasio, W. & Lounsbury, M. (2012). *The Institutional Logics Perspective.* Oxford : Oxford University Press.
- Villani, E. (2018*). Il trasferimento tecnologico tra sfide e opportunità: ruoli e strategie degli intermediari.* Turin: Giappichelli.

SITOGRAFY

- VQR 2004-2010. (2010). Retrieved January, 12, 2019 from http://www.anvur.it
- Survey. (2015). Retrieved December, 10, 2018 from http://www.ASTP-Proton.eu
- Report. (2015). Retrieved January, 12, 2019 from http://www.crui.it
- Report. (2018). Retrieved February 5, 2019 from http://www.netval.it
- Report. (2013). Retrieved December 5, 2018, from http://www.pnicube.it