Italian science parks, incubators and innovative clusters: some considerations starting from a questionnaire investigation on research spin-offs

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Introduction

In February 2003 in a Communication on the role of the universities in “the Europe of knowledge” the European Commission underlined the importance to intensify effective and close cooperation between universities and industry: “...it is vital that knowledge flows from universities into business and society. The two main mechanisms through which the knowledge and expertise possessed and developed by universities can flow directly to industry are the licensing of university intellectual property, and spin-off and start-up companies” (Commission of the European Communities, 2003: 7). This document assessed Europe’s critical needs in the epoch of “knowledge-driven economic growth” and the means to meeting those needs. Spin-off and start-up companies play a key role. In particular, in recent years we have assisted to an increased interest in the “research spin-off phenomenon”. Research spin-offs\(^1\) are the most evident example of integration between the university world and the industry one that foster the links between universities and SMEs. This particular kind of firms highlights the potential importance of structures such as science parks and incubators. Following the creation of science parks in the 1980s, business incubators have been the main tool used in the 1990s to promote the creation of new enterprises (Wright et al., 2007). These structures are linked to many initiatives emerged in recent years with the aim to foster entrepreneurial activities.

More specifically, the results of a questionnaire investigation undertaken between January and June 2008 in Italian research spin-offs highlighted interesting findings on the most utilized facilities provided by science parks and incubators as well as on the main characteristics of on-park spin-offs (located inside a science park-incubator). The aim of this paper is, therefore, to provide an overview of the main significant results of the questionnaire investigation\(^2\) and to provide some suggestions for policy improvement.

The paper is structured as follows: section 1 provides an overview of the history and development of science parks and incubators, while section 2 describes the Italian scenario. Section 3 provides a survey of the questionnaire investigation and section 4 illustrates the case-study of the Bioindustry Park Silvano Fumero. Conclusions follow.

Science parks and incubators: a survey of their history and development

There is no uniformly accepted definition of a science park (Link, Scott, 2003; Link, Link, 2003; Wessner, 2009; Lofsten, Lindelof, 2005; Dettwiler et al., 2006). A number of definitions of a science park have been proffered in recent years (Link, Scott, 2006). The emphasis is on technology transfer from the university, on the knowledge flow and on regional economic growth. Nonetheless, we can say that the term

\(^1\) I define research spin-offs all the firms coming from the research world with or without a university share and a patent, but established by current or former university/research centre members - professors, technical and adminstrative staff, PhD candidates – with the aim to exploit research results.

\(^2\) The questionnaire investigation is deeply analysed in Salvador, Rolfo (2011), Mariotti, Salvador (2011), Salvador (2011) while a comparison between the sample of questionnaire respondents and a sample of start-ups is investigated in Salvador (2011a).
“science park”³ is usually used to describe a property based initiative that has formal and working links with a university or other higher education institution or research centre. A science park is a business support and technology transfer initiative that encourages and supports the start up, incubation and development of innovation led, high growth, knowledge based businesses, provides an environment where larger and international businesses may develop specific and close interactions with a particular centre of knowledge creation for their mutual benefit (Parry, Russell, 2000; Ferguson, Olofsson, 2004).

It is widely acknowledged that the earliest parks were established in North America in the 1950s (Cesaroni, Gambardella, 1999; Colombo, Delmastro, 2002; Sofouli, Vonortas, 2007; Link, Scott, 2003; Link, Link, 2003; Wessner, 2009; Bellavista, Sanz, 2009). Park formations increased sharply in the late 1970s and early 1980s in all countries also under the stimulus of the Bayh-Dole Act and the passage of several technology initiatives in the early 1980s (Link, Scott, 2007, 2006, 2003). Silicon Valley with its Stanford Research Park and Route 128 in Massachusetts were the first successful initiatives. In Europe, science parks are concentrated in France and the United Kingdom (Sancin, 1999). In Italy the first science parks were established in the 1980s: Area Science Park of Trieste, which is the largest science park in Italy (Bigliardi et al., 2006), in 1982 and Tecnopolis Novus Ortus of Bari in 1985. Several other examples followed in the coming years. Since the end of the 1990s, almost every Italian Region has at least a science park (Sancin, 1999).

In the absence of an agreed and clear policy, the Italian science parks context is characterized by particularities such that every science park denotes distinctive and almost unique characteristics, not only due to regional needs. Diversity is an important characteristic of science parks well underlined in the literature (Wessner, 2009). According to Link and Scott (2003: 1325) and to Link and Link (2003: 81), “the definition of a research or science park differs almost as widely as the individual parks themselves”. In Italy it is, therefore, possible to find science parks of huge dimensions, like Area Science Park of Trieste, the Bioindustry Park of Canavese, now Bioindustry Park Silvano Fumero, and the Environment Park of Turin, as well as less consolidated structures, in particular in the South of Italy. Science parks of wide dimensions have not only the possibility to host businesses, but also to foster research activities because of the presence of research laboratories, and thus they are involved in knowledge production. Smaller and less consolidated science parks are more involved in providing managerial assistancy rather than in innovation activities (Sancin, 1999). Notwithstanding their dimension and heterogeneity, the rationale for the creation of science parks may be considered proximity to university laboratories and research centres, the presence of an incubator, the creation of networking opportunities, the role as bridging institution providing tenant firms with suitable accommodations and technical and business services (Colombo, Delmastro, 2002; Link, Scott, 2003, 2006, 2007).

³ The term “science park” is more prevalent in Europe, while the term “research park” is more prevalent in the United States and the term “technology park” is more prevalent in Asia (Link, Scott, 2007: 661).
The presence of an incubator is a pivotal factor. An incubator has the aim to support new young firms in their first years of life when newness and small size may be a risk. One of the key goals of incubators is to accelerate the start-up process and minimize the rate of failure (Antonelli, 2004; Graberi, 2006). Main elements in analysing incubators are: the territory, the network of embedded actors, the services provided and the beneficiaries of these facilities. Therefore, since the 1960s (Hackett, Diltz, 2004b), structures providing a supportive environment and shared facilities for helping the establishment of young firms as well as their development and maximization of their growth and rate of survival, were established in the industrialized countries. These structures are referred to as “incubators”\(^4\). The incubator model is frequently developed within a science park structure, of which an incubator is an important cornerstone. There are different incubator models. Significant differences are related to public or private stakeholders’ characteristics, incubator goals, target markets, facilities and services offered, location-specific factors (Serazzi, 2005). It is possible to identify public, private, corporate, university, profit or non-profit, multi-purpose or specialized incubators (Antonelli, 2004). The US Batavia Industrial Center, New York State, has been the first to be established in 1959 (Hackett, Diltz, 2004; Sofouli, Vonortas, 2007). The introduction of the US Bayh-Dole Act in 1980 fostered the diffusion of incubators. In Europe the first pioneers were Edinburgh, Cambridge and Oxford Universities that founded incubators between the 1980s and 1990s. In particular, university incubators are focused on hi-tech companies developed by university personnel. They aim at fostering the industrial application of knowledge coming from research activities. They are non-profit organizations and they are located near the university. They are managed directly from the universities or they are operated by associations, foundations, consortia. They have a strong link with research departments and they are usually focused on the sectors in which the parent institute is specialized, e.g., ICT, nanotechnology, biotechnology, pharmaceuticals (Serazzi, 2005).

The concept of incubation evolved over the years and there are currently three generations of incubators, characterized by differences in the business support services. The first generation incubators provided physical space and basic shared facilities. The second generation provided more specialized business support services, like counselling. The third generation, referred to as networked knowledge incubators, appeared at the end of the 1990s, with availability of networking for the sharing of knowhow and the promotion of best practices among entrepreneurs. Networking, face-to-face interaction and trust in an incubator have been investigated in recent years (Cooper et al., 2010). The incubation process was accelerated by the Internet revolution and its positive feedback on high-tech businesses. Thanking to the ICT revolution and the diffusion of Internet (Benghozi et al., 2009), incubator projects began spreading first in the US and second in Europe. The growth since 1980 in the number of US business incubators suggests that\(^4\) An extensive review of the literature on incubators and a list of definitions culled from the literature is provided by Hackett, Diltz (2004b).
it was desirable to try to help “weak-but-promising” firms to avoid failure by incubating them (Hackett, Dilts, 2004, 2004b).

The main difference between an incubator and a science park is given by the fact that the latter hosts firms yet consolidated, even multinationals and big firms, research centres, structures linked to universities and higher education institutions. Science parks are more focused on technology transfer and knowledge creation, because of the networks among the several actors hosted. Incubators are, instead, more focused on fostering and helping the creation of new firms through knowledge valorization (Graberi, 2006). In principle, incubators and science parks alike should be considered as a means to reduce the so called “liability of newness” (Ferguson, Olofsson, 2004; Gilbert et al., 2006; Sofouli, Vonortas, 2007; Schwartz, 2009; Schwartz, Hornych, 2010; Salvador, 2011; Salvador, Rolfo, 2011). Liability of newness relates to the high failure risk young firms face in the first years of their life. Start-ups and young firms do not have stable business relationships and they do not possess any reputation and need some time to gain legitimacy in the market (Schwartz, 2009). According to Hannan and Freeman (1984), firms with low reliability and accountability will be eliminated from the population. Therefore, newly founded firms need to demonstrate that they are reliable and trustworthy business partners towards the market (Schwartz, 2009). Incubators and science parks are perceived as useful solutions. Their function is linked to the necessity to create a stable and effective network of contacts in terms of potential financers, clients, suppliers.

Science parks and incubators have a key role to play in the first years of life of newly established companies. The actual question is whether the potentialities of these structures are translated in concrete effectiveness. The admission criteria are usually very selective in order to filter good entrepreneurial projects, but the potential success of these business ideas cannot be given for granted. Therefore, the question whether science parks and incubators are really effective in supporting young firms is still without an agreed answer. In general, the growth in science parks has fostered an academic debate concerning whether such initiatives directly enhance the performance of corporations, universities and economic regions over time (Link, Scott, 2007). A specific interest in identifying best practices in the formation and operation of such parks emerged. “Unfortunately, few academic studies directly address these issues” (Link, Scott, 2007: 662). Furthermore, according to a recent study by Yang et al. (2009), despite the growing interest in the science-park phenomenon, empirical attempts at indentifying whether new technology-based firms located within these structures are more innovative are limited and the results are ambiguous. Schwartz (2009) argued that direct comparisons between survival rates of tenant companies and control-groups of off-park firms may not be meaningful. In fact, the incubator-specific selection process induces relatively low failure rates during incubation and thereby selection bias tends to result in an overestimation of the

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effectiveness of science parks and incubators to this aim. Similarly, Lindelof and Lofsten (2004) asserted that one logical way to assess the technological innovation of science parks is to compare the performance of their tenants to off-park firms. But this approach has its limitations because of the difficulties of identifying a reliable comparison sample.

In Italy a few years ago Colombo and Delmastro (2002) tried to provide a contribution through an empirical investigation on the Italian context. Their findings proved that science parks are an important tool of a technology policy fostering the development of new technology-based firms. Salvador (2011) tried to contribute to the debate on the effectiveness of science parks and incubators that work as “brand names” for research spin-offs. If “the essence of a brand is that it is a name in the memory of consumers. Brand creates meaning and identification” (Fan, 2002: 185-186), a science park or an incubator can work as a network of positive and favourable associations for tenant companies willing to grow. The selection criteria applied by science parks and incubators tend to filter good entrepreneurial projects, but the potential success of these business ideas cannot be given for granted. The lack of managerial and business competencies (Shane, Stuart, 2002; Lockett et al., 2003; Heirman, Clarysse, 2004; Wright et al., 2004; Shane, 2004) and the lack of credibility of a particular kind of firm like the research spin-off need to be supplemented by the aid of a structure like an incubator or a science park, that may serve a function of “certification” for spin-offs (Akerlof, 1970) and may help develop management competence. The knowledge potential of a research spin-off firm is not enough. It has to be linked to a structure that works as a solution to the needs of the single spin-off firm. Therefore, following the question suggested by Link and Scott (2007: 671) if science parks have a unique place within a national innovation system, Salvador (2011: 226) assumed that “if it is true that “[science parks] should not a priori be considered a primary element of a nation's innovation system...[they] are not a sine qua non of the knowledge flow...[science parks] fall under the broader category of an effective educational system”, it is also true that an improved and more effective role as brand names could warrant a higher status and contribute to include these structures in the elements of a national innovation system”. Salvador and Rolfo (2011) contributed to the debate on the effectiveness of science parks and incubators providing the results of a regression model and a questionnaire investigation on Italian research spin-offs. More concretely, they proved the effectiveness of the objectives of science parks and incubators through a questionnaire answers provided directly by spin-off founders and through a comparison between the questionnaire perceptions and characteristics of on-park and off-park spin-offs. This investigation was preceded by a regression analysis with the aim to show whether the number of these structures has an influence on the one of spin-off firms in Italian regions.

According to Hackett and Dilts (2004b: 74) “while much attention has been devoted to the description of incubator facilities, less attention has been focused on the incubatees”: recent contributions seem to try to fill this gap and the following analysis fosters an improvement towards this goal. More specifically, an increasing use of questionnaires aimed at investigating main perceptions of the incubatees is suggested.
An overview of the Italian context

Italy provides a good setting for an investigation on the link between research spin-offs and science parks and incubators. Several initiatives have been carried out in recent years in order to improve the conditions for the establishment of this kind of firms: many Italian universities, since 2002, issued spin-off regulations following the Legislative Decree n. 297/1999 (Salvador, 2009); Technology Transfer Offices (TTOs), and Industrial Liaison Offices (ILOs) have been created following the law 262/2004 (Nosella, Grimaldi, 2009); specific attention has been devoted to science park and incubator structures. Furthermore, the regression model tested by Salvador and Rolfo (2011) found that the number of Italian science parks and incubators has a positive influence on the number of research spin-offs.

Notwithstanding, with a total population of nearly 60 million of habitants subdivided in 20 Regions, Italy shows several structural problems that hinder the innovation potential and the economic performance. Bureaucracy, political instability and a marked delay in fostering and supporting the new information and communication technologies (Colombo, Delmastro, 2001, 2002; Bassanetti et al., 2004; Finlombarda, 2006; Bianchi et al., 2010), are affecting the Italian context. "A major change is now expected with the launch of the E-government 2012 plan that, starting from an intervention for ICT diffusion in public administration, should act as a major instrument to stimulate economic recovery", (Inno-Policy TrendChart: 2009: 9). Special factors such as low-skilled workers entering the labour market, weak investments on R&D, firms specialising in traditional sectors and the prevalence of small family businesses which are less prone to innovate (Bianchi et al., 2010; Balderi et al., 2007), and insufficient product market competition, can have contributed to depress measured productivity growth. Since the 1990s, Italy’s performance has substantially lagged behind that of other main European Union economies (Inno-Policy TrendChart, 2008). The Italian structural problems reduce the ability to take advantage of the innovative technologies spread throughout the world in recent years (Fondazione Rosselli, 2007; 2008; Bassanetti et al., 2004). In spite of a widespread entrepreneurship oriented towards traditional/mature sectors, Italy is behind in promoting the creation of new technology-based firms (Colombo, Delmastro, 2001, 2002; Finlombarda, 2006). Furthermore, the worsening of the international macroeconomic scenario are all pointing to the downside. Italy is in the group of “moderate innovators”, with a performance below EU average but above the group of “catching up” countries (Inno-Policy TrendChart, 2008, 2009), while according to Fondazione Rosselli (2007; 2008) Italy is in the group of “scarcely innovative countries”. The analysis developed by Fondazione Rosselli (2007; 2008) to measure and compare the innovation potential of 19 major industrialised countries, highlighted that technology transfer is one of the fields where an improvement is observable in Italy, in particular in terms of spin-off firms. The spin-off of high-tech business ideas is gradually increasing as a new strategic orientation of Italian universities. In this context a pivotal initiative has been undertaken by Italian universities since 2001 for research spin-off firms. Their increasing numbers over the past few years have prompted many Italian universities to establish rules to control the spin-off process and address related issues systematically.
The inspiration for the issuing of spin-off regulations was the Legislative Decree No 297/1999, which is concerned with the ‘reorganization of the discipline and streamlining of the procedures for the support of scientific and technological research, for the diffusion of technologies, for researchers’ mobility’. The Ministerial Decree of 8 August 2000, No 593, sets out ‘procedures for giving support according to Legislative Decree n. 297/1999’ (Salvador, 2009).

Given this general context, it is important to stress also the main changes in the regional governance system occurred in recent years. Since 2005, the contribution of Italian regions to the innovation policy formulation process and the management of measures favouring R&D and innovation increased due to the reform of Title V of the Constitution in 2001 and its implementation through the Law 131/2003. Thanks to the new power acquired by the Regions in the field of scientific research and technological innovation policy, R&D and innovation regional policy initiatives have been developed. Several regions provided specific instruments whose application has been launched at local level. Nevertheless, the duality between the central government and the regional actors’ intervention is still affecting the Italian system and more coordination between the two levels would be useful in order to better define industrial policy objectives and territorial balancing as well as to establish responsibilities and areas of intervention (Inno-Policy TrendChart, 2008, 2009). According to Bianchi et al. (2010), globalisation has made necessary the modernisation of Italy and the elimination of many structural delays. Main challenges for the Italian system are given by the improvement of technology transfer mechanisms to reduce the existing gap between research and the market, by innovation financing, in particular venture capital, and by mobility of talents, especially brain drain. Yet, several policy interventions had been introduced in order to address these challenges. And science parks and incubators can be considered as an important tool in order to address these challenges.

Science parks, incubators and research spin-offs: a questionnaire investigation on Italy

I undertook a questionnaire investigation on the universe of Italian research spin-offs between January and June 2008. Descriptive statistics of the main results coming from the questionnaires received are computed in Salvador and Rolfo (2011) and the case-study of Turin is investigated in Salvador (2011). The universe of research spin-off firms I identified in Italy was 419. I was able to contact 394 firms: 25 research spin-offs had the positive approval of the university at the time of the survey, but they had not yet been established. The response rate was 39.5%: 155 spin-offs accepted to answer to the questionnaire. The questionnaire was divided in several sections: to the aim of this analysis section D “incubator/science park and spin-off firm relationship” is important. 65 research spin-offs out of 155 were tenant firms of an incubator/science park, while 90 were off-park companies. The comparison between these 65 research spin-offs on-park and 90 research spin-offs off-park revealed few conclusive differences with the significant exceptions that on-park companies were on average more internationally oriented and more linked to their parent institute. The international propensity of on-park spin-offs has been also confirmed by the probit analysis undertaken by Mariotti and Salvador (2011). Furthermore, the questionnaire investigation confirmed
that distance matters, because the proximity of the science park/incubator to the parent institute was considered to be a key factor by most of the on-park sample.

The questionnaire investigated the perceptions of tenant firms on the main advantages and services utilized. According to the questionnaire results, the most important advantages coming from the hospitality in an incubator-science park were the possibility to use the services provided by the structure, the rent less expensive than on the market, the greater visibility. Among the facilities most utilized by tenant companies, the questionnaire results showed that “meetings organised by the incubator-science park with business personalities” and “open spaces for meetings” were the most appreciated, followed by “networking with other firms”, “tutorship” and “consultancy” services. The questionnaire answers highlighted the recurrent choice of the aid provided by science park and incubator structures, even if the results in terms of growth and performance seemed to be poor (Salvador, 2011, 2011a). More specifically, the aid provided by a structure like an incubator or a science park is important, because not only it provides tutorial services and facilities but it is also a guarantee of reliability in front of potential clients and in front of banks that are more inclined to give loans to firms positive evaluated by a university incubator. Nevertheless, the result of the comparison between Turin spin-offs and a matched sample of start-ups highlighted a lower performance of spin-offs. As a consequence, the need to improve the role as brand name of science parks and incubators was suggested. If we look at the verdict on hospitality in an incubator/science park, most of the respondents provided a positive answer and they argued that the geographical proximity of this structure to the university is a pivotal factor. This result confirms the literature evidence that distance matters (Link, Scott, 2003, 2005, 2006, 2007). The questionnaire results did not highlight significant differences between the perceptions of on-park spin-offs and off-park ones. This could suggest that science parks and incubators are not as effective as they could be for research spin-offs. Nevertheless, the positive verdict on the hospitality and the key importance of the geographical proximity to the parent institute as well as the international attitude of on-park spin-offs are an important evidence of the soundness of the current policy.

The questionnaire was compiled only by research spin-offs: it would be interesting to send a similar questionnaire to all the firms hosted in an incubator-science park. Therefore, it would be useful to have also a sample of start-ups as respondents to a questionnaire. In this way we could have a more comprehensive overview of the perceptions of the universe of SMEs hosted in these structures. Notwithstanding, we can say that the results of the questionnaire investigation on research spin-offs confirmed that the debate on the effectiveness of science parks-incubators is still open, but it also highlighted interesting aspects on the activities and the services provided. The positive evaluation on the hospitality in these structures enhances the idea that there is a need for improvement rather than an overall change of policy, as suggested in Salvador, Rolfo (2011). More specifically, the questionnaire answers underlined that communication channels and network activites (Hackett and Dilts, 2004b) are really important. Furthermore, an international attitude as well as the proximity to the university are pivotal. In fact, science parks are important
“networking” actors (Antonelli, 2004). They provide hospitality and services to potential start-ups and spin-offs. Inside a science park it is possible to find several structures that cooperate to foster commercialisation of new products and services. Research centres, incubators, financing societies are common examples (Antonelli, 2004).

The following section illustrates the history and the context of the Bioindustry Park Silvano Fumero. This park has been chosen as a case-study because it is one of the most important in the Italian context, it introduced the life science sector in a territory mainly based on other sectors, it hosts research spin-offs as well as start-ups, but it is quite far from the higher education institutions. This characteristic makes the Bioindustry park an interesting case-study, given the general importance of the proximity to the parent institute. It seems that the set of activities implemented by the park is able to fill the distance gap. To this aim, also in this case it would be useful to send a specific questionnaire to the universe of the firms hosted, focused on the location and the linked advantages and/or disadvantages and the ability to build network relationships at the international level notwithstanding the geographical location.

A case-study: the Bioindustry Park Silvano Fumero, “bioPmed” and “Discovery”\textsuperscript{6}

The Bioindustry Park Silvano Fumero\textsuperscript{7} (BIPCa SpA – Colleretto Giacosa, TO, Italy), previously known as Bioindustry Park of Canavese\textsuperscript{8}, is located 40 km far from Turin (Piedmont region – North West of Italy) and it has been realized with an entrepreneurial approach in order to promote and develop biotechnology research. The park is a joint stock company with over 12 million Euro of registered capital (31 December 2009). It has been conceived as a territorial strategic tool to support the introduction and the growth of a new sector - “life science” - in a territory based mainly on mechanics, electronics and ICT (Conicella, Baldi, 2011). The Bioindustry Park is a science and technology park with an area of 70,000 sq.m. equipped for production activities and 16,000 sq.m. of laboratories, offices and pilot production plants. It is the second biotech science park in terms of size and importance in Italy (Buchi et al., 2010; AA.VV., 2010).

It was established in 1998 and it has as shareholders public institutions and private companies. The project of the Park was adopted by Piedmont Regional Authority as a priority in the regional industrial policy. The Bioindustry Park has been realized in the context of European Union Structural Funds, with contributions from the European Fund for Regional Development, and is jointly financed by the State and the Regional Authority, who granted a total investment of 52 million Euro. The Park promotes and develops research in biotechnologies and life sciences. It offers research facilities, scientific and support services, such as technology transfer, patent support, tutoring/mentoring of start-ups and spin-offs. More specifically, it hosts national and foreign companies, small and medium enterprises, that intend to undertake research activities

\textsuperscript{6} This section has been read and commented by Fabrizio Conicella, General Manager of Bioindustry Park, who provided interesting and useful comments and suggestions.  
\textsuperscript{7} In 2009 the Park changed name in honor of its founder, Silvano Fumero, manager and scientist died in 2008.
and experimental production in the chemical, pharmaceutical, diagnostic, veterinary, agro-food, cosmetics, bioengineering and information technology (Conicella, 2010; Conicella, 2011; Conicella, Bassi, 2011). It gives priority to small entrepreneurs and researchers wishing to undertake innovative projects. Start-ups and spin-offs are assisted in the pre-startup phase, in the start-up one, in the development path and finally way-out. Since the beginning, the science park had the goal to develop a dedicated value network that allows the start-up and growth of successful companies. Attracting companies, creating start-ups, realising technology transfer activities and acting as hub for international networking are still the main aims of the Park (Conicella, 2010). Bioindustry Park in this role is acting as a real System Integrator that enables the use of synergies between public and private initiatives (Conicella, 2011). Piedmont region is not providing yearly transfer of funds for the management of the Park. Only specific and evaluated projects, such as the bioPmed project (see infra) are supported by regional authorities and only in the form of co-financing (Buchi et al., 2010). The financial situation, as resulted from the 2010 balance accounts is positive and only around 10% of turnover is represented by public financing.

“The science park developed a quite interesting governance model based on a triple helix, private public partnership approach” (Conicella, Baldi, 2011: 9) with a shared vision of fostering entrepreneurship development and research results transfer. The Park is a private company with public majority and the presence of two major pharma companies (Merck-Serono and Bracco), local public administrations and regional financing institutions as shareholders. It hosts more than 35 different organizations (July 2011) and it is in contact with more than 250 companies, many of them are formally committed to boost the cluster bioPmed (see infra). At the same time Bioindustry Park manages directly an R&D lab focused in providing scientific services and in realising internal R&D activities. Results of such activities are available for licensing and collaborative research agreement.

Another pillar of the structure is supporting the creation of innovative and focused start-ups: the park in the last 5 years has created more than 15 start-ups that have been able to raise more than 30 million Euros of private risk capital (Conicella, 2010, 2011). Clustering activity, last but not least, allows the Park to be a contact point for more than 100 companies located in the Region not only for partnering research at the world level but also for supporting them in marketing activities. The Bioindustry Park has also a Bioincubator realized in the context of Piedmont region 2000 - 2006 DOCUP (programming single document of the Region). The Bioincubator offers 9 prepared spaces, for as many companies operating in the life science field, besides shared areas and equipments.

Following the above considerations, we can say that the Bioindustry Park hosts not only private enterprises, but also proprietary shared labs, based on the concept of technological platform, managed in close collaboration with the University of Turin and one of the CNR’s research centres specialized in

9 The list of companies part of the enlarged network of the Bioindustry Park is on-line at the following address: www.biopmed.eu
proteomics (Conicella, Bassi, 2011). Support services and a series of advanced services relative to the search of financing for research activities and to the search of business angels, to technology transfer, to patents, etc. are also provided. The international dimension seems particularly important. Biotech sector is global in its nature. Critical mass, systemic approach, internationalisation are key factors (Conicella, 2011).

According to Conicella (2010: 48), to Conicella (2011: 12-13) and to Conicella, Bassi (2011: 10) “Results of the first 10 years of life of Bioindustry Park are confirming that it is possible to develop an high tech sector through a science park approach: around 23 different companies, three research centers / universities and different association, with a total of around 500 workers are located in the Park area. Other four companies with around 300 workers are located in a 10 kilometres distance from the Park. All those organisations except two have located in the area after the creation of the Science Park”. Furthermore, “after more of 10 years of activity Bioindustry Park has a percentage of occupation of 95%, hosts around 30 different organizations and more of 500 employees and is well positioned at local, national and international level” (Conicella, Baldi, 2011: 10). According to Buchi et al. (2010: 85) “During the latest 10 years the Bioindustry Park has helped more than 30 companies to raise and to grow, gathering more or less 30 million Euros of equity and this is a great result if compared to the youth of the Ivrea biotech reality”.

In this context, the Bioindustry Park is embedded in two interesting initiatives: Discovery and bioPmed (see infra). It is also important to mention the PartnerPorts service platforms, that are an initiative in progress in the context of the ABC Europe project.

The Discovery initiative

The Discovery initiative10 is managed by Bioindustry Park in strong partnership with Eporgen Venture11 and with the support of Piedmont regional authorities. Discovery is a project focused on start-up creation. It has been based on the development of a local seed capital company set up by a group of informal investors, called Eporgen, that, with a self-sustaining approach, has involved more than 40 local small investors and that has been coupled with the Bioindustry Park incubator. Therefore, Eporgen Venture has been created with the support of Bioindustry Park involving local investors and business angels. Regional funds for incubation has been used to develop a positive environment, private money has been used to create innovative companies (Conicella, 2011; Conicella, Baldi, 2011; Conicella, 2010).

Discovery is a selection promoted by the Bioindustry Park in order to find innovative ideas in the life science and biotechnology sectors with high technological contents. The Discovery project consists of three core phases: selection of deserving scientific projects, location of the company in the park Bioincubator that also provides equipment, general services, tutoring services, shared facilities and access to Bioindustry Park

10 For further information, see the website www.bioindustrypark.eu; http://discovery.bipcaweb.it/
11 Eporgen Venture “is the first Italian company, entirely funded by private, non-institutional investors, dedicated to seed capital investments in the area of life sciences. It was established in June 2004 with the aim of establishing and supporting the development of new enterprises operating in the life sciences field and born of highly innovative projects of international scientific importance”, (Buchi et al., 2010: 82).
Lab and instrumentations and investment in seed capital by non-institutional bodies that the park has been able to involve in the scheme. This last one is something completely new in the Italian context (Conicella, 2011; Conicella, 2010). From June 2004 to November 2009 through roadshows and promotional activities around 20 start-ups have been created and more than 7 million Euros of seed capital/business angels capital has been raised in this initiative. A part of capital has been provided by Eporgen Venture. The goal is to assure financial resources for the first 24 - 36 months of development of start-ups providing also managerial assistance. Discovery is one of the few examples of integrated approach to the start-up of innovative companies in biotech linking physical facilities, tutoring support, access to scientific know-how and instrumentation and seed capital funds (Conicella, 2011, 2010).

The bioPmed initiative

The Bioindustry Park developed the bioPmed initiative\(^\text{12}\) as a focused and sectorial life science cluster project. bioPmed is the Innovation Cluster for the biotechnology and medtech sectors in Piedmont region, launched in May 2009. “According to the EU recommendations, it is a grouping of independent undertakings — innovative start-ups, small, medium and large undertakings as well as research organisations — operating in a particular sector and region and designed to stimulate innovative activity by promoting intensive interactions, sharing of facilities and exchange of knowledge and expertise and by contributing effectively to technology transfer, networking and information dissemination among the undertakings in the cluster” (Conicella, 2011: 13; Conicella, Bassi, 2011: 11; Conicella, 2010: 48).

As of July 2011, bioPmed - led by the Bioindustry Park - consisted of 70 organizations, including large companies, SMEs, Universities and research centres working in the Life Sciences sector, signatories of a formal agreement on its creation and development (Conicella, Baldi, 2011; Conicella, Bassi, 2011). Why this initiative? After ten years of successful initiatives in the life science sector, the Bioindustry Park recognized that two main gaps limited the further development of the park. These two gaps have been identified in the geographical concentration and a focus on physical infrastructures. In order to fill these gaps an innovative cluster\(^\text{13}\) policy scheme has been developed by Piedmont region (Conicella, Baldi, 2011). More specifically, within the POR-ERDF 2007-2013\(^\text{14}\) program, Piedmont Regional Authority promoted the establishment of twelve innovation clusters in twelve different technological areas, and appointed a managing body for each cluster, chosen from bids received in a dedicated call for tenders (bioPmed report 2009/2010). The Bioindustry Park proposed to be the managing company of one of these clusters with a

\(^{12}\) For further information, see the websites [www.biopmed.eu](http://www.biopmed.eu) ; [www.piemontbiosciences.org](http://www.piemontbiosciences.org)

\(^{13}\) “Innovation Clusters are pools of enterprises – from innovating start-ups to large multinationals – and research organizations, coordinated by a managing body and focused on specific sectors and geographical areas”, (Conicella, Baldi, 2011: 10). See also Conicella, Bassi (2011).

\(^{14}\) “The Regional Operating Programme (POR) Regional Competitiveness and employment is the planning tool of the European Fund for Regional Development (ERDF),whose financing aims to boost competitiveness of the regional system, leveraging both the capability to produce and absorb new technologies and the ability to use natural and environmental resources in a sustainable model of development”, (bioPmed report 2009/2010: 7).
focus on life sciences for healthcare, because the Park “has realized that to maximize the return from the territory it is necessary to “go out” of the physical boundaries of the science park” (Conicella, Baldi, 2011: 11).

Main pillars of bioPmed are: project building, community building, sharing facilities, information and promotion at international level. The overall aim of this initiative is to develop the local bio/med-tech cluster in order to sustain the growth of all its players, particularly the companies. The Cluster is thus focused on issues related to company start-up, to development of the entrepreneurial system and of local and international synergies, to the study and resolution of intellectual property concerns and, of course, to the development of networks with academia and the research world (Conicella, Baldi, 2011; Conicella, 2011; Baldi et al., 2010; bioPmed report 2009/2010). As the managing body, the Bioindustry Park plays the following roles: it is in charge of the innovative cluster project; it acts as an interface between regional authorities and the cluster members; it inspires, coordinates and promotes the overall activities (bioPmed report 2009/2010). The managing body enables also the participation of the Cluster in several Italian, European and worldwide projects. These projects have the goal to foster technology transfer and spreading of know-how and skills. In such a way, services, knowledge and tools not previously available in the Region, are therefore available for the members of the cluster.

Conclusions

In this paper I provided some considerations on the role of science parks and incubators in Italy starting from a questionnaire investigation in the universe of research spin-offs. Italy has given considerable attention in recent years both to the research spin-off phenomenon and to science park and incubator structures. They are useful and important tools of technology transfer. More specifically, the questionnaire results highlighted the international attitude of research spin-offs hosted in a science park-incubator as well as the importance of a geographical proximity to the parent institute. The services provided by the structure, the rent less expensive than on the market, the greater visibility and networking activities proved to be of key importance. Notwithstanding, the questionnaire analysis did not highlight significant better results for on-park spin-offs compared to off-park ones: science parks and incubators seemed not to be as effective as they could be for research spin-offs (Salvador, Rolfo, 2011; Salvador, 2011). Nevertheless, the positive verdict on the hospitality and the key importance of the geographical proximity of the hosting structures to the university as well as the international attitude of on-park spin-offs are pivotal proofs of the soundness of the policy in progress. McMahan (2009) highlighted the importance of a policy environment that is patient, adaptable and focused on commercialization. Specific attention provided to the needs of every single firm could be useful instead of general policy prescriptions. Furthermore, a similar questionnaire investigation in the universe of the firms hosted in these structures, meaning not only research spin-offs but also start-ups, could enable to confirm or not these results and to improve the knowledge on the perception of the science park location benefits that the hosted firms are receiving as well as on the perceived advantages and
disadvantages. To this goal, the activities carried out by the Bioindustry Park Silvano Fumero, chosen as case-study, seem to go into this direction. More specifically, the recent Discovery and bioPmed initiatives are interesting challenges. And a specific questionnaire sent to the participating firms could provide information of key importance for policy improvement and future park strategy. An empirical investigation based on self-evaluation by the respondents is one of the best solution in this case, because it provides primary data sources that captures data directly from the respondents. In other words, subjective data based on perceptions and judgements of a questionnaire respondents enable to obtain information that are not available from secondary data sources like databanks. For example, in measuring success Manchester Science Park tenant companies are asked to fill out a questionnaire annually (Davies, 2009). Therefore, I suggest Italian science parks and incubators to increase and/or improve the use of specific questionnaires at least on an annual basis, aimed at understanding in depth the situation of every firm hosted.

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**Biography:**

Elisa Salvador holds an International PhD in “Institutions, Economics & Law (IEL)” from the University of Turin (Italy), with a thesis on research spin-off firms in Italy (April 2010). She undertook some of her PhD research at the Centre de Recherche en Gestion (CRG) at l’Ecole Polytechnique, Paris, during the year 2008-2009, under the supervision of Pierre-Jean Benghozi (Director). She has worked for the Institute for Economic Research on Firms and Growth of the Italian National Research Council (Ceris-CNR), Moncalieri-Turin, since 2001 on several projects which have focused on innovation policies. In 2005 she won the Italian National Research Council (CNR) award “Promotion of Research 2005”, Project for young researchers, with a research project titled “The financing of research spin-off firms: an analysis of the Italian case”.

Her research interests are currently focused on research spin-off firms, innovation policies, SMEs. She has recently collaborated as a research assistant with the Chaire Entrepreneuriat of the Business School ESCP Europe, Paris, under the supervision of Jacqueline Fendt (Academic Director of the Chaire). She has also published recently several scientific papers on research spin-offs and SMEs.