XXXIII CONFERENZA ITALIANA DI SCIENZE REGIONALI

Regional Innovation Systems and Path Dependence: Policies for a Lock-Out

Dario PEIRONE[1]

SUMMARY

Well-structured regional policies could have a huge impact on the dynamics of innovation generation, that are crucial for achieving national innovation policy objectives. However, a problem in implementing original policies on innovation at the local level is how to operate in a conservative environment. The paper presents one case-study of an incubator developed in UK, the SetSquared partnership, an original model with respect to mentoring, fundraising and relationship with the local economy. This case shows how a correct policy implementation could break the locked-in practices towards a lock-out solution, with a new architecture of economic interactions in a regional innovation system.

[1] Tenured Assistant Professor of Economics and Management. Department of Economics "S. Cognetti de'Martiis", University of Turin. E-mail: dario.peirone@unito.it.

.

1 Introduction

A crucial problem in implementing original policies on innovation and growth at the local level is how to operate in a conservative environment (Eurada, 2011; Innovation Union Competitiveness Report, 2011). In this paper I analyse EU regional innovation systems as *path dependent*, where some inefficiencies are locked-in, but where original trajectories can be found trough new policies, implemented taking into consideration both the institutional background and territorial productive endowment. I do it looking not only at the set of institutional rules, but trying to present a policy vision for the "global" efficiency of a regional innovation system (Freeman, 1988; Nelson, 1993). This methodology was chosen because considering only the "institutional" characteristics would lead to use only few benchmarks, while the university – industry relationship, the strategies of large incumbents, the characteristics of labour market and the potential of entrepreneurs and financiers would in fact be ignored. A large body of literature (reviewed in Peirone, 2010) shows the importance of dynamic learning (learning by doing, by using, by consuming etc.) fed by the accumulation of tacit knowledge, to activate a process of incremental technological changes, for stimulating firms' growth by sustaining long-term competitive advantage (Rosenberg, 1976, 1982). The paper presents one case-study of an incubation model developed in UK by a public-private partnership, called SetSquared. This is an original model with respect to mentoring, fundraising and relationship with the local economy. It was designed by the British Government for stimulating growth in the South West part of England, involving private and public subjects. Just over the last five years £0.75bn of investment funding has been raised and more than 1000 jobs have been created trough SetSquared. This case shows how a correct policy implementation could break the locked-in practices towards a lock-out solution, with a new architecture of economic interactions in a regional innovation system. This analysis can be applied to other regions where a path dependent process created bottlenecks to economic growth, for finding new patterns of systemic development.

2 Methodology and Scenario

Well-structured regional policies could have a huge impact on the dynamics of innovation generation, that are crucial for achieving national innovation policy objectives; in addition,

successful regional policies can be an effective response to the challenges posed by globalization, making regions able to retain entrepreneurial champions linked to the territory.

In an evolutionary perspective, the processes of knowledge creation are strongly influenced by the historical record of successes or failures, thereby limiting the range of possible future directions for the innovation activities of the company (Nelson and Winter, 1982) within "technological trajectories" (Dosi, 1988). This mechanism of long-term corporate innovation processes related to past experience and then to the dynamics of accumulation of knowledge, it is called *path dependence* (Arthur,1994) and it is based on the connections between the technological development and the institutional conditions that locally affect the slow process of accumulation. Therefore, history matters in an evolutionary perspective: the legacy of history in terms of structures, institutions and ideas (at regional level), is often a cultural barrier for new development opportunities. New paths of development, even within the same region in which they occur, are not perceived as new organizational and production opportunities. Politicians note just after a long time that there have been fundamental changes (Calvosa, 2010). Evolutionary economic geography (Boshma, Frenken, 2006; Asheim, Boschma, Cooke, 2007) interprets the local development as an evolutionary process focused on the concept of path dependence and requires that the innovation policy should give greater attention to the historical evolution of the territory from the point of view of the productive infrastructure, in order to exploit opportunities for development and to overcome potential obstacles, which may curb future growth (Calvosa, 2010).

In this perspective, the spatial agglomeration of individuals engaged in the same activity can bring the phases of introduction of innovation near to market response. The learning by using and learning by interacting represent important means used by the business district to create and disseminate innovations endogenously. The district model is an innovation system scarcely driven by institutional factors and instead anchored in face to face relationships, following the physical proximity between the actors (Penco, 2010). As part of the district phenomena, must single out the case of high-tech district: it is generally caused and fueled by processes of knowledge transfer from universities and public and private research centers (Garnsey and Smith, 1998) to some companies already existing or newly established (Torrisi, 2002) and / or by processes of disintegration and division of labor enabled by high technology companies. Unlike the marshallian industrial districts, it is possible to identify a local system of innovation typically structured according to a model defined as *hub and spoke* model, where a party hub, either a large innovative firm, university or research center, generates and supplies the district system and the innovative processes (Guerrieri and Pietrobelli, 2004).

This leading subject stimulates the creation of spin-offs and of induced satellites smaller companies, choosing to locate near the hub to take advantage of co-localization (Penco, 2010).

Relying mainly on the "resources-based" literature, it is possible to define modern firms as complex systems with the target of creating value, by sustaining a long term competitive advantage (Peirone, 2010). The central and main dynamic factor of learning activities (learning by doing; learning by using; learning by consuming etc.) is the accumulation of tacit knowledge that can eventually activate a process of incremental technological changes (Rosenberg, 1976, 1982). A large literature has shown that the location of firms in areas of high industrial concentration causes a positive effect on productivity, innovation and hence on the construction of competitive advantage (Porter, 2000; Porter, 1998). These effects were mainly traced to the agglomeration economies generated by the concentration of firms in a geographic area. The sources of agglomeration economies are tied to the level of highly qualified and specialized skills in the area, to the possibility for companies to access an efficient labor market, to the ease of establishing cooperative relationships with suppliers and distributors and, finally, to the opportunity to exploit the spillover information descendant from competitors (Penco, 2010). Agglomeration economies are factors underlying the existence of local production systems, consisting of spatial agglomeration of production activities linked by relations of technical and / or commercial complementarity (Bellandi, 1995). The learning processes activated by the cooperative relationships involve the formation of networks different from the past, in terms of types of actors involved and modes of governance and operation. The Triple Helix model of the development of local innovation systems (Etzkowitz and Leydesdorff, 2000) certifies that genetic mutation of the networks of local actors, in particular by specifying the central role of universities and public research centers in general (Parente e Petrone, 2010). This new type of local model of development requires a change of mentality and operation of universities, the subjects institutionally dedicated to the production of new knowledge: in particular, it is necessary for the academia to create the conditions for a more efficient and faster economic valorization of the technical / scientific results obtained through the efforts of its human resources and infrastructure (Brett et al., 1991; Piccaluga, 2001, Bonaccorsi and Daraio, 2007) but, at the same time, without affecting the historical mission. Gibbons et al. (1994) have identified a gradual transition from Mode 1 to Mode 2 in the production and commercialization of new knowledge produced in universities. Mode 1 provides that the new knowledge is produced in universities with few direct connections to the real needs of economic environment. In this case the potential users

will decide alone whether and how to bring the research results up to the stage of industrial application. The Mode 2 is instead characterized by a greater involvement of universities in the industrial application of research results, with blurred boundaries between academia and industry. In this second model, research is most often carried out with direct reference to the application context, with a straight influence by the potential recipient companies since the early stage of development (Parente and Petrone, 2010). Studies on collaboration between universities and industry and its possible determinants have grown significantly since the late nineties (Etzkowitz, 1998). In particular, a variety of factors were analyzed to explain the development of such collaborations, investigating the perspective of universities and researchers (Di Gregorio and Shane, 2003; D'Este and Patel, 2007; Abraham et al., 2009), of enterprises (Cohen et al., 2002, Fontana et al., 2006), the incidence of regional context (Audretsch, Feldman, 1996; Cooke et al., 2004, Chapple et al. , 2005) and specific clusters (Saxenian, 1994). This vision of "Entrepreneurial University" is based on five chacteristics (Etzkowitz, Leydesdorff, 2000): the capitalization of knowledge, where University commercially exploits research results and promotes economic development in the local area; the interdependence, in the sense that the university interacts with industry and institutions, being no longer isolated as it was in the past; the independence, namely the university is an independent institution and does not constitute an emanation of other organizations; the hybridization, as a synthesis between the principles of interdependence and independence, through the creation of hybrid organizational models that allow university to interface with the territory; the reflexivity, where the internal structure of the University is able to innovate trough the relationships with industry and the public authorities.

In sum, at the local level innovation can be defined as an evolutionary, non-linear, interactive process that requires intensive communication and cooperation between enterprises and other organizations such as universities, public research institutes, research centers, financial institutions, regulatory bodies, industry associations and government agencies. This means that the process is heavily influenced by formal and informal institutions operating at local level. This perspective has emphasized the role of institutions in shaping and practice models of governance for innovation at national or regional level, giving rise to the literature on national systems (inter al.: Lundvall, 1988, 1992, Freeman 1987, 1991, Nelson, 1993, 1996, Edquist, 1997) and regional innovation (among al. Cooke et al., 1998, Asheim and Cooke, 1999; Cooke, 2001; Asheim, Isaksen, 2002). This approach has led over time to identify best practices, however, setting up an ideal model and undifferentiated governance of local development that has not been able, in many cases, to interpret the differences between

regions in terms of wealth of knowledge rooted paths of industrial made, the skills gap, the local nature of the relations (Calvosa, 2010). As it will be showed by the case study portrayed in this paper, the mechanisms of local innovation and technology transfer to the economic system, which more clearly appears as the "third mission" of universities, appear instead to be multiple and diverse (Parente and Petrone, 2010).

3 The changes in policy about Universities and Incubators: the case of UK

Over the past two decades, universities have been urged to become more accountable to the wider public and to contribute directly to local, regional and national economic development through taking on a range of 'third stream' activities. Such activities include the incubation of start-up firms, the commercialisation of knowledge, the development of knowledge transfer partnerships, and the delivery of entrepreneurship courses. This 'third mission' for the university now sits alongside its other two core functions – teaching and research. Developments of this kind within the sector have spawned a range of terms to describe the transformation of the idea of a university: the 'entrepreneurial university' (Etzkowitz, 2003); the 'service university' (Cummings, 1998); and 'academic capitalism' (Slaughter and Rhoades, 2004). Whilst universities have historically been involved with industry in a variety of ways (for instance, in areas such as agriculture, military activity, ship building, mining) (Lawton Smith, 2007), it was not until the 1980s that an entrepreneurial role for universities became increasingly part of mainstream policy and practice (Feldman, and Desrochers, 2003; Lawton Smith, 2007). Taking note of early developments in the United States of America, particularly as a consequence of Bayh Dole Act in 1980, governments in a range of countries, including the United Kingdom (UK), Australia, Sweden, Germany, Italy and Japan, have all introduced policy measures to encourage such activities (Patton et al., 2009). Activities that many universities now engage in, and which constitute 'third stream' or 'third sector' include patents, such as pharmaceutical products, the trademarking of business ideas, spin-out firms that might involve investments from the university and the business sector and so on. These activities, however, are often viewed by academics as peripheral to the central task of teaching and research (Patton et al., 2009).

We sustain in this work that it is important to locate these knowledge mediation strategies within wider structural, cultural and political contexts. To this end we examine changes in the national policy context for universities as an 'opportunity structure' enabling the emergence of a range of third stream activity in universities, such as business incubators. The concept of

'opportunity structures' can be found in the wider social science and economic development literature. Its more extensive use has been as a way of understanding the relationship between the wider political environment and the emergence of social movements (cf. Eisinger, 1973; Kitschelt, 1986). Specific configurations of resources, institutional arrangements and historical precedents for particular actions can facilitate and privilege some groups' activities over another: variations occur between groups over time, and across space with different results of particular configurations of opportunity structures at work. Dosi (1997) also uses 'opportunity structures' to understand the relationship between technology and social change. He distinguishes between four inter-related elements:

• changes in *opportunities* – that is, the sources of change giving rise to this domain;

• the *incentives* to exploit these opportunities;

• the *capabilities* of the agents to achieve whatever they try to do; and

• the *institutional arrangements and mechanisms* through which such changes are implemented.

Innovative opportunities are interpreted as 'opportunity structures' for certain political, economic and cultural, as well as sectoral projects, policies and programmes.

As said before, the organization of firms now appears to be influenced also by the need to implement the complementarities of the different pieces of knowledge possessed by the productive structure. So, new technologies are sorted out, not only by their absolute levels of efficiency, but also with respect to their complementarity and compatibility with the local productive and economic conditions. Adoption of new technologies will be determined by the durability and irreversibility of internal factors such as the capital stock, but also the skills of human capital, the location in a given space and the relationships with customers and suppliers. The effects of "lock in" become, therefore, just a possible outcome of path-dependent diffusion, as well as a "lock out" solution (Antonelli, 2008). Cooperation has become a significant type of competitive advantage. Adding inflows of knowledge (from financial investors, venture capitalists, international partners and institutions) that is related to the existing knowledge in a region is crucial for building a critical mass of knowledge based clusters. Regional innovation strategies should be aimed to allow for a local economic transformation concentrating public resources on innovation and knowledge-based development challenges. However, to be effective, the new policies need to build on a region's capabilities, competences, competitive advantages and potential for excellence within the value chains, enhancing stakeholders' involvement and encourage governance innovation and experimentation.

In the UK, higher education policy, and its funding streams, have emphasized economic competitiveness and wider societal roles of universities. This new configuration of policies provides *possibilities* for new actors and initiatives to emerge with the potential to destabilise existing social practices, relations and boundaries. Between 1989 and 1997 the proportion of public funding into universities significantly declined. This led to institutions having to generate more income from non-governmental sources in what came to be known as **'**third stream' funding (in addition to the primary sources for teaching and research), and to policy initiatives from the Government and funding councils to support such strategies.

In 2002 the *Investing in Innovation* Strategy (DTI, HM Treasury and DfEE, 2002) highlighted issues surrounding the long-term sustainability of university research. It focused on the need to encourage greater collaboration between universities and the business sector through increased investment in knowledge transfer activities particularly through the expansion of HEIF. In December 2003 the Lambert Report noted that while there had been "a marked change of culture" (p. 3) among universities towards greater collaboration with business, and that government funding for knowledge transfer activities had been important in this change, the report also pointed out the lack of demand from the private sector for those knowledges and skills in universities.

This wider policy environment can be viewed as an opportunity structure that gives rise to the possibility for, though does not predetermine, the emergence of new sites to be created, such as business incubators, for new relationships to be formed, and for new knowledges to flow across boundaries. In the UK, the emergence of technology-based incubators originates from an assumption by government that the promotion of such activity will foster the development of a knowledge-based economy (Patton *et al*, 2009). They are intended to offer a training ground for nascent entrepreneurs to be found within and outside of the university community. Incubators also serve as a mechanism for commercialising science and technology-oriented applications. As boundary spanners, they are intended to link technology, capital and know-how to entrepreneurial talent for the purposes of accelerating the development of new companies (Youtie and Shapira, 2008; Markman, Siegel and Wright, 2008), and thus speed the commercialization of technology. The British government approached this newer mission for universities by promoting the idea of 'usefulness' (e.g. Lambert Review of Business–University Collaboration, 2003), supported by sizeable funding streams for universities (Lawton Smith, 2007) aimed at building competitive, 'knowledge-based' economies (cf. DTI, 1998). The UK government has also argued that universities could raise the innovative performance of industry, as well as to significantly contribute to city-regional development. In

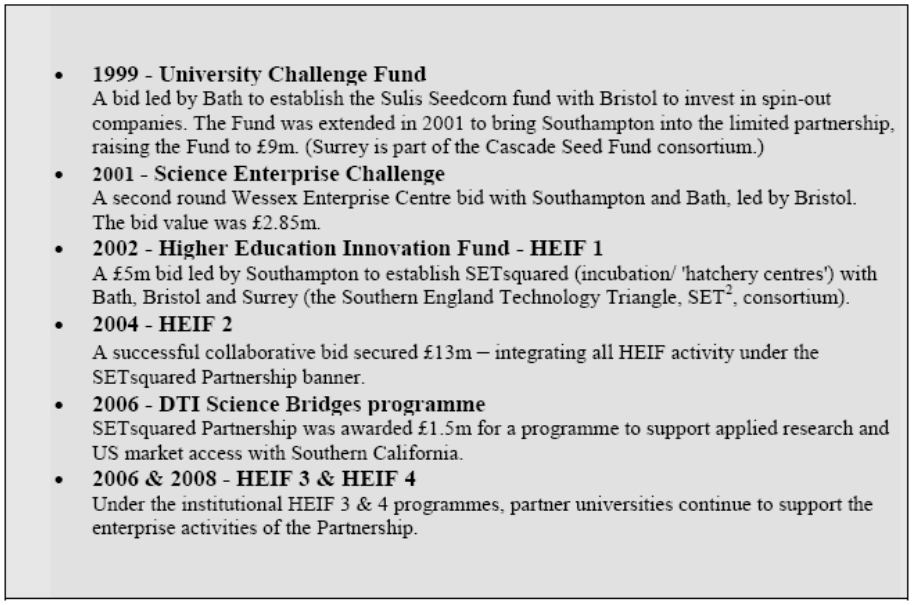
relation to the latter case, this view was encouraged by evidence suggesting proximity of firms to universities was critical for the transfer of knowledge between them (Saxenian, 2006; Lawton Smith, 2007). As a result, over the past decade there has been a shift in government policy, from one focused upon research excellence and its dissemination amongst the academic community, to one which now includes a range of knowledge-transfer activities with the wider business community, and other stakeholders. In its 2009 policy framework, Higher Ambitions: the Future of Universities in a Knowledge Economy, universities were represented as "…the most important mechanism we have for generating and preserving, disseminating and transforming knowledge into wider social and economic benefits" (BIS, 2009a: 7). It is within this context that governments have been interested in supporting and realizing high-tech innovation through university spin-off companies and hi-technology incubators (Wright et al, 2006). Despite the growing significance attached to these developments, we know little about how these intermediary organisations strategically manage knowledge 'brokerage' (Meyer, 2010) and 'mediation' (Osborne, 2004) processes to ensure the flow of knowledge across the boundaries of different worlds.

To investigate these processes, we examine four hi-tech incubators, established in 2002, making up the *SETsquared Business Acceleration Partnership* between four universities (Universities of Bath, Bristol, Southampton and Surrey) in Southern England, now enlarged to five with the entrance of Exeter University in the partnership. These university incubators are aimed at creating linkages and new opportunities for firm development as well as mutual learning between the university and the economy of the city-region.

4 New strategies for innovation and technology transfer: the SetSquared Partnership

The SETsquared Partnership was established in 2002 between the University of Bath, University of Bristol, University of Southampton and the University of Surrey. These four institutions are located in one of the strongest economic areas in England – the South of England – spanning the west and east regions. In combination these four universities hold research staff of 6,500 and a budget of £266 million accounting for 7% of the UK's research budget, suggesting that research activity is particularly strong. The development of the SETsquared Partnership has, over time, been funded through a range of Government programmes (see Table 1)

Table 1



The main purpose of the SETsquared Partnership is to increase the level of successful business start-ups, and to stimulate economic growth in the region's economy. A further motivation in forming the Partnership was to create a critical mass of research and development activity that would enable this region to compete with the top research universities - Cambridge, Oxford and Imperial College. Whilst progressive rounds of funding enabled the Partnership to expand, this was not a straight-forward process: the early collaboration between Bristol and Bath to secure funding from the University Challenge Fund was the outcome of a forced relationship by the Office of Science and Technology (OST). The Partnership is supported by a 'central office' that is dispersed across the partnership sites. The range of activities under the Partnership is now relatively wide and includes a number of 'relationship-based' university-industry linkages, such as academic consultancy, sharing facilities and student placements; it also supports spin-outs from the universities.

It is now recognised that the creation of incubators on their own may not be sufficient to achieve the goals expected from the introduction of policies aimed at facilitating the creation and development of firms per se and, more specifically, new technology based firms. The extant literature indicates that a more developed understanding of the underlying processes of incubation and the types and timing of interventions may be critical for achieving accelerated firm growth than the creation of an incubator infrastructure (Khavul 1998; Reid and Garnsey 1998; NBIA 1997). The suggestion, therefore, is that incubators deliver added value through the provision of more intangible factors —the diagnosis of business needs, support with

business planning, introductions to peer group networks, the deployment of professional networks, mentors and funding agents —than through the physical infrastructure (see Campbell *et al.* 1985). It is therefore suggested that the more tangible elements of the incubator, physical space, staffing, management and external networks are less important than the way in which such factors are configured to support the business proposal. It is of concern therefore that the majority of literature to date has focused more upon the outputs of the incubation process, for example income generated, jobs created and/or rates of firm survival, than the process that has created such outcomes (Patton et al., 2009).

To describe the dynamics that favor the processes of accumulation of local knowledge it is possible to look at three elements (Zander and Sölvell, 1995; Calvosa, 2010):

a) the nature of the innovation process;
b) the barriers to the diffusion of knowledge created locally;
c) the attraction of external resources that can strengthen the process of accumulation knowledge within the local context.

a) In relation to the nature of the process of generating knowledge that characterizes the high-tech cluster, previously analyzed, it is possible to identify a number of specific local factors determining the activation of this process:

- A first condition of context that facilitates the process of knowledge production is the presence in the cluster of major scientific institutions, public or private. In this regard, regional policy makers should develop policies aimed at financing both in basic research, with respect to which knowledge spillovers occur, or application type research in the areas of specialization of the cluster. Also important is the role that they must take the 'influencers' choices of allocation of expenditure on R&D of the central government, as well as to intermediaries for access to transnational funding;
- The existence of a production system operating in high technology sectors characterized by a highly developed and dynamic relationship, especially a formal one, which allows to connect, under long-term relationships and of established practices, businesses, customers, research institutions, educational system and government institutions. The regional policy makers should therefore facilitate the emergence of start-ups and spin-offs in the areas of specialization of the cluster, develop policies to support the transfer of know how between companies and between them and universities or research centers, support the creation of agencies for technology transfer as well as science and technology parks or incubators (Castells and Hall, 2000; Cesaroni, Gambardella, 1999);

- A further characteristic of an area that can facilitate the development of innovative processes is related to the policy to guarantee funds to finance innovation, and develop initiatives to facilitate the attraction from the outside, with a view to marketing, venture capital firms and business angels;

b) A second element is the relevance of barriers to the diffusion of knowledge. To assess the degree of mobility and speed of diffusion of knowledge is possible to distinguish between the knowledge embodied in physical capital and human capital and relational. Policy makers should set up regional policy guidance and facilitation for training focused on issues of sectoral specialization area. So important is the role of mediator for sharing among businesses, schools, universities and training centers, private training programs aligned with the training needs required by the local productive environment;

c) The third element of the model refers to the ability of an area to attract resources from the outside.

As far as our case-study in concerned, across the four SetSquared incubators between 80-90% of the firms incubated come from ideas from outside the university (spin-ins) whilst the rest (10-20%) come from insider the university (university spin-offs). These figures reflect the nature of the incentive structures in place: they are attractive to local entrepreneurs from outside the university because of the lower cost of rent for a start-up firm (begins lower then increases over time with the success of the start-up); they have shared access to administrative support; support through personal high quality mentoring (a combination of incubator personnel/business mentors); and access to wider industry and enterprise networks. However, the incentive structure for academics, particularly where academic publishing is highly valued, tends not to reward third stream activity in the same way. Nevertheless, what makes SETsquared incubators unique are the potential benefits from being located close to the university, with access to university facilities and resources, including academic consultancy, students for projects, and recruitment of graduates. The partnership of four universities also gives a powerful ‘brand value’ to attract investors. The majority of the firms at the SETsquared Business Acceleration Centres have some linkage with the university. In the last six years, companies supported by the Centres raised over £120 million and created more than 1000 jobs. 100 businesses have ‘graduated’ from the Centres, typically after 18 months to three years.8 The four universities also run annual SETsquared Investor events in London.

Each SETsquared Centre has a distinctively different business model. For example, in Bath more than 50 companies have been supported at the Innovation Centre, 90% of which came

from the wider business community, and the other 10% are University spin-outs. In total Bath Ventures has generated businesses worth £10 million, and 160 jobs for the local Bath economy. In Southampton subsequently 28 (very early stage) firms have joined the incubator and 15 firms are current members. Like Bristol and Bath, the majority of firms (22) that have joined the incubator are external to the University. Nevertheless, in Southampton some of the more successful proposals have been developed from within the University (Patton *et al*, 2009). The University of Southampton is considered to be the one of the most successful in the world, along with Stanford in California, in the creation of spin-out companies (Franklin *et al*, 2007). The University has created 12 spin out companies since 2000 and over 50 since 1969 and, if the number of indirect spin-offs is taken into account, the number is over 100. Between 2001 and 2007, Southampton was one of the most successful universities in the UK in terms of investment in its spin-out companies. The University has decided that enterprise is a key part of the University's culture, and a key part of the University's offering both to students and to staff. Based on that strategic decision, the University decided essentially to invest in enterprise and entrepreneurial activity. The SETsquared activities are funded by the institutional HEIF funding stream so that the costs of incubator activities are covered.

Across the four sites, there is growing collaboration bilaterally, or based on local proximity. Collaborations between Bristol and Bath centres are noted, through the Bristol Science City, Science Park (S-PARK) and BEN network. Many of the Bath Innovation Centre member firms are also located in Bristol. The three regional networks run by the Bath Centre support start-up firms, the business community and academia, in the Bristol-Bath area. Collaboration for events between Bath and Southampton, Bath and Surrey were also mentioned in the interviews. Southampton and Surrey Centres also collaborate due to their geographical proximity. However to date there have been no university spin-off firms at the Centres based on collaborative research between the partner universities.

Each of the Directors operates in a rather different way; these differences between directors are the result of their own philosophies and interests, their sense of their own expertise and experiences, the spatial and organisational 'proximity' of the incubator within the each host university, and the expectations of their universities: the Director in Bath is a marketeer, the Director in Southampton is a salesman, the Director in Surrey is experienced in operations, etc.

Bristol's incubation model starts with heavily subsidised rent at the beginning but this is time limited, and initial intensive input and support. The idea is that the start-up grows into bigger

space, and the rent goes up over time. So, after 2 ½ years, they are in a space which is above market rent, so they move out when they stop getting value from the centre.

There is little doubt, given the small number of staff in each of the incubators, the SETsquared Partnership has achieved a great deal in terms of generating economic value for their wider city-regions. This level of success has occurred despite the incubators operating in an environment where publicly funded universities are necessarily cautious about the risky nature of commercial activity, and universities their own limited capacity to support commercial activity properly.

However, at present the success of university incubators, when measured in terms of the numbers of start-up companies, is dependent upon ideas for enterprises emerging from outside the university, rather than inside. Viewed from the opposite direction, Incubator Directors, with their industry backgrounds, contacts and networks, also have limited networks *within* the university, and therefore limited capacity to mediate the directional flow of this knowledge across the academics. A further continuing cause of friction between the academic culture of the university and engagement with incubator and other third stream activity is the incentive structures for academics, particularly arising from the research assessment regimes that have been in place.

However, as said before, simply putting policies into place is not enough to smooth the tensions in cultures. The incentive structures will need to alter, but in ways that both missions are not at odds with each other.

In the UK there has been considerable and growing interest from policy-makers in promoting spin-off companies from universities (cf. DTI, 1998; HM Treasury 2002). The economic boom of the late 1990s, energised and enabled by funding schemes for new innovation support mechanisms, resulted in an upsurge in spin-off activity from UK universities. In 2006/7, the total number of active spin-off firms from universities exceeded 1200. In terms of survival rates, compared to 2003/4, 35% more formal spin-off companies are active after three years according to the 2005/6 HE BC survey (HEFCE, 2009a). However, the Lambert Review of *Business-University Collaboration* in 2003 argued there had been too many spin-offs of low quality, and that university infrastructures were not equipped to support these ventures. There was also a concern that spin-offs were being given "… undue prominence in consideration of university performance in research commercialisation" (Minshall and Wicksteed, 2005). There was a tendency among firms to concentrate their efforts too much on the technology at the expense of finding markets and customers (Patton et al., 2009). Those founders that join the incubator rarely integrate to the degree necessary to develop potential

synergies from the proximity of like minded individuals, similar business contexts or overlapping technology. Consequently the notion that firms in the incubator may build collaborative activity relating to research, products or markets simply does not materialize (Patton et al., 2009). In response to Lambert's concerns, UK Business Incubation (UKBI) launched a National Business Incubation Framework to support incubation management teams through various strategies, such as benchmarking, going beyond numbers of start-ups, and amounts of capital raised (Hannon and Chaplin, 2003). In reviewing their data UKBI concluded there was no single model or template for the running and structuring of a business incubation environment.

From the case of the SETsquared Partnership clearly emerges that policies focused on incubators need to pay attention to incubation as a process, rather than simply on the visible hardware. *There is no one way* to promote incubation. Whilst this is an obvious point, and one that that been noted elsewhere, the wider regulatory environment of universities, particularly as a result of the implementation of new public management, tends to undermine rather than contribute to diversity.

5 Conclusions

This paper primarily focused on innovative regional policies, defining the assets to rely upon, introducing them into the existing eco-system, with a model of network of expectations aimed to a lock-out solution of path dependent regional systems of innovation and investigating how players relationship (as a network) can impact on innovation adoption for development of specific regional area. The case study of SetSquared partnership helps to investigate how an incubator can interact with selected firms and key stakeholders to deliver an effective level of support required to foster the development of high-tech business proposals. This model of incubation has succeeded to overcome many of the shortcomings stressed by the official report on University-business collaboration, trough a flexible approach adapting to the characteristics of the local economic environments and, at the same time, incentivizing collaborations between universities. The case also shows the difficulties in changing the culture in the academia towards entrepreneurship.

Bibliography

BONACCORSI A., DARAIO C., *Universities and strategic knowledge creation*, Edward Elgar Publishing, Cheltenham, 2007.

CALVOSA P., "Le strategie regionali per l'innovazione dei cluster ad alta tecnologia in una prospettiva evoluzionista", Sinergie n.83, pp. 53 – 77, CUEIM 2010.

DOSI, G. (1997) 'Opportunities, Incentives and the Collective Patterns of Technological Change', *The Economic Journal*, Vol. 107, No. 444 (Sep., 1997), pp. 1530-1547.

DTI (1998) *Our competitive future – building the knowledge driven economy*: *Analysis and Background*, December 1998.

DTI, HM Treasury and DfES (2002) *Investing in innovation strategy*, July 2002,

D'ESTE P., PATEL P., "University-industry linkages in the UK: what are the factors underlying the variety of interactions with industry", *Research Policy*, vol. 36, n. 9, pp. 1295-1313, 2007.

DI GREGORIO D., SHANE S., "Why do some universities generate more start-ups than others", *Research Policy*, vol. 32, n. 2, pp. 209-227, 2003.

ETZKOWITZ H., "The norms of entrepreneurial science: cognitive effects of the new university-industry linkage", *Research Policy*, vol. 27, n. 8, pp. 823-833, 1998.

ETZKOWITZ H., LEYDESDORFF L., "The dynamics of innovation: from National Systems and 'Mode 2' to a Triple Helix of university-industry-government relations", in *Research Policy*, vol. 29, n. 2, pp. 109-123, 2000.

FONTANA R., GEUNA A., MATT M., "Factors affecting università-industry R&D projects: the importance of searching, screening and signaling", *Research Policy*, vol. 35, n. 2, pp. 309-323, 2006.

GIBBONS M., LIMOGES C., NOWTON H., SCHWARTZMAN S., SCOTT P., TROW M., *The new production of knowledge*, Sage Publications, London, 1994.

HEFCE (2001) Higher education-business interaction survey: HEFCE Research Report 01/68. HEFCE, London.

HM Treasury (2002) *Investing in Innovation: A Strategy for Science, Engineering and Technology*, HM Treasury, London.

LAWTON SMITH, H. (2007) 'Universities, innovation and territorial development: a review of the evidence', *Environment and Planning C, Government and Policy*, 25, pp. 98-114.

LUNDVALL B.Å, "The University in the Learning Economy", DRUID Working Paper, n. 02-06, 2005.

LUNDVALL B.Å., "Innovation as an interactive process: from user-producer interaction to national system of innovation", in Dosi, G. et al., Technical change and economicthery, Printer Publishers, London, 1988.

MARSHALL A., Principle of economics, Macmillan, London, 1920.

NELSON R. R., "National innovation systems: A retrospective on a study", in G. Dosi e F. Malerba, (a cura di), *Organisation and strategy in the evolution of the enterprise*, Suffolk, Macmillan, 1996.

NELSON R.R., (a cura di), *National Systems of Innovations. A Comparative Study*, Oxford, Oxford University Press, 1993.

NELSON R.R., WINTER E. S., *An Evolutionary Theory of Economic Change*, Cambridge, The Belknap Press of Harvard University Press, 1982.

PARENTE R., PETRONE M., "Strategie di co-evoluzione nei sistemi locali innovativi", *Sinergie* n.83, pp. 31-53, CUEIM 2010.

PATTON, D., WARREN, L. and BREAM, D. (2009) 'Intangible Elements That Underpin High-Tech Business Incubation Processes', *Journal of Technology Transfer*, 34, pp. 621-636.

PENCO L., “Dai sistemi locali ai network de-territorializzati:verso i meta-distretti e le reti tra distretti”, Sinergie n.83, pp. 9-31, CUEIM 2010.
PORTER M.E., “Clusters and the new economics of competition”, *Harvard Business Review*, November-December, pp. 77-90, 1998.
PORTER M.E., “Location, competition, and economic development: Local clusters in a global economy”, *Economic Development Quarterly*, vol. 14, n. 1, pp. 15-34, 2000.