IS THERE A LOCAL INNOVATION POLICY TO SUPPORT ACADEMIC START-UP ACTIVITIES?
AN EXPLORATORY CASE STUDY OF HEIDELBERG

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ABSTRACT:
It is increasingly acknowledged that innovation is a systemic phenomenon where the interaction in a regional system of innovation is important. This is particularly true for the establishment of new enterprises. The autonomy of the regions and the resulting regional policy focus is accentuated in Germany. However, the availability of public funds for the early phases of firm establishment and development is very limited. A new means of the local and regional governments to support entrepreneurship with rather small public funds is the interactive economic policy approach. In this approach, the local or regional government acts as mediator to facilitate cooperation between different stakeholders in order to overcome coordination problems. The purpose of this paper is to assess entrepreneurship support in Heidelberg and to investigate whether it follows an interactive economic policy approach. Heidelberg is embedded in a high-technology region in Germany with a large number of public and private research institutes in the field of medicine and biotechnology. Interviews were conducted with stakeholders from the university, regional and local policy makers and start-up companies. Special emphasis is on the type of support that the start-ups received.

JEL CLASSIFICATION: L26, O38.

KEYWORDS: Regional innovation policy, start-ups, innovation networks, interactive economic policy.

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INTRODUCTION

It is generally acknowledged that technological change and innovations are the most important factors behind economic growth. Innovations or “new combinations” as termed by Schumpeter (1934) are a major cause of the creation of new jobs as well as the destruction of old jobs. Furthermore, it is generally accepted that “firms almost never innovate in isolation” (Edquist 1997, p. 21). Interaction and networking between different firms is important to generate new ideas that possibly lead to new products, new processes or new organisational structures. Firms interact with other organisations (e.g., customers, competitors, universities, governmental agencies) in the context of existing institutional structures. Furthermore, a regional perspective on innovation is frequently applied. One prominent example in this context is Saxenian’s analysis of Silicon Valley, California and Route 128, Massachusetts (Saxenian, 1994). It can be argued that interaction works most effective on the local and regional level. Interaction and learning presumes that the actors share the same or at least similar perceptions of reality. In other words, they share the same “mental models” (Hofstede, 1996). Thus, regional and cultural proximity is an important factor that fosters interaction and networking between different actors in the innovation system. Innovation systems are comprised of a broad range of organisations, such as firms, regulatory agencies, organisations for higher education and research, technology support entities, patent offices etc. Universities and other research organisations play a particularly important role in contemporary societies and innovation systems. They can be regarded as the “producers” of scientific knowledge which gives them an important role in the innovation process. Not surprisingly, “as key sites both for research into new fields and for the training of future researchers and skilled personnel, universities and other higher education institutions have found themselves inevitably drawn into the modern national policy arena” (OECD 1999, p. 9). Nowadays, universities are expected to interact more frequently with private industry and to adapt more to its needs. Knowledge and technology transfer is, therefore, a way to further increase interaction between universities and firms in innovation systems. Knowledge and technology transfer can take a number of different forms. As Czarnitzki et al. (2000) have shown there are different mechanisms and means for knowledge and technology transfer, such as publications, collaborative research, educating students, and spin-offs. The study of the spin-off phenomenon has attracted much attention in recent years. The establishment of new enterprises serves an important function in the economy. Already Schumpeter (1934) characterised the entrepreneur as the most important engine behind economic growth. Elam (1993, p. 14) points out that “Schumpeter’s position was that studying innovation means studying individuals called entrepreneurs”. In our empirical context, the entrepreneur is defined as an individual that establishes a firm. From an evolutionary perspective, new firms introduce novelty into the economic system. The creation and introduction of novelty is one of the main mechanisms in the dynamics of contemporary economies. Empirical

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research has shown that small high technology-based firms are frequently involved in what Lindholm-Dahlstrand (1997) terms the “system of ownership changes” which means that new firms are established (or spun-off from existing large firms) in order to develop new technologies. The firms grow and when they reach their limits with respect to further production and marketing of the products, they are acquired by larger firms. This is in line with Williamson’s argument (1975) that large firms have early-stage disadvantages but later-stage advantages in the innovation process. The consequence would be that innovations that are developed in small firms are subsequently acquired by large firms leading to a market for technology-based firms. Lindholm-Dahlstrand (ibid.) has shown that more than one-quarter of all Swedish small technology-based firms are going through both types of ownership changes, namely spin-off and acquisition. Those arguments and results indicate that newly established firms serve an important function in the economy. They create novelty and economic dynamics.

Thus, it becomes obvious that the establishment of new firms is important for an innovation system in order to sustain its economic dynamics. The public support of start-up activities has increased in the recent years. There are a lot of different ways and means to support entrepreneurship. A new means of the local and regional governments to support entrepreneurship with rather small public funds is what Elsner (2001) terms “interactive economic policy approach”. In this approach, the regional government acts as mediator to facilitate cooperation between different stakeholders in order to overcome coordination problems. This approach can be regarded to require less financial resources in the form of direct subsidies to firms but more “human” resources that are capable of bringing together the actors and organisations in the innovation system that are important for firm establishment and development. The purpose of this paper is to assess entrepreneurship support in Heidelberg and to investigate whether it follows a kind of interactive economic policy approach.

The chapter 1 presents the theoretical framework of the paper. It builds on systemic approaches to innovation focusing on regional innovation systems. Chapter 2 explains the methodological approach. The case study of Heidelberg is presented in chapter 3. The analysis is presented in chapter 4.

1. THEORETICAL FRAMEWORK

A systemic perspective is applied as starting point in order to assess local and regional entrepreneurship policy in Heidelberg. The notion of an innovation system was developed by Lundvall (1992), Nelson (1993) and further developed by Edquist (1997). The major strengths of this approach are according to Edquist (2005), that it places innovation and learning at the very centre of analysis. The systems of innovation approach is basically about the determinants of innovation. It applies a holistic and interdisciplinary perspective which takes into account historical and evolutionary processes. The notion of an optimum or an ideal system is absent. The consequence is that thorough empirical analysis of the innovation system in question is required in order to understand the
interaction patterns in the system and to be able to provide recommendations for improvement. The systems of innovation approach emphasises interdependence and non-linearity which makes interaction and learning processes important. A systemic perspective can be applied in order to study product and process innovations as well as subcategories such as organisational innovations. Particularly important for the empirical analysis is the focus on institutions. Institutions in this context mean the “rules of the game” which can be formal institutions (e.g., laws, regulations) or informal institutions (e.g., habits, customs). Institutions have to be distinguished from organisations which are defined as the “players” of the game (North, 1990). Systemic approaches to innovation focus on the interaction of the organisations in the system. As Edquist (1997, p. 21) puts it “in the systems of innovation approach, innovations are not only determined by the elements of the system but also by the relations between these”. However, it has to be stressed that the systems of innovation approach is not a formal theory since it is still associated with conceptual diffuseness. This is particularly relevant with respect to the boundaries of the system. It is basically up to the individual researcher to define what is included in the system and what should be left out. Nevertheless, systemic approaches to innovation are frequently applied in scientific articles as well as advisory reports due to the flexibility with regard to empirical (case study) analysis. Innovation systems can be defined in different ways, for instance, national, sectoral or regional innovation system. Particularly relevant for the empirical part of this paper is the regional innovation system. According to Asheim and Gertler (2005, p. 299), “the regional innovation system can be thought of as the institutional infrastructure supporting innovation within the production structure of a region”. The concept of the region lies between the national level and the individual level of firms. The importance of the region as analytical unit has been stressed by Lundvall and Borrás (1999, p. 39) since “the region is increasingly the level at which innovation is produced through regional networks of innovators, local clusters and the cross-fertilizing effects of research institutions”. There is a large variety of actors on the regional level, such as, industry associations, chambers of commerce, universities and other research organisations, public organisations that support regional development, regional banks, and, of course, individual firms. Following the broader definition of innovation system by Lundvall (1992, p. 12), the regional innovation system includes “all parts and aspects of the economic structure and the institutional set-up affecting learning as well as searching and exploring”. However, there is a large variety regarding interaction and cooperation within regional innovation systems. Institutions govern those interactions and have to be included in the analysis accordingly.

Asheim (1998) distinguishes between three types of regional innovation systems. In the first type, the territorially-embedded regional innovation system, firms base their innovation activities mainly on localised learning processes without much interaction with universities or other research organisations. The second type is the regionally-networked innovation system which is characterised by localised interactive learning as well. In addition, deliberate public policy intervention provides regional support infrastructure. The regionalised national innovation system is the third type of regional innovation system.
The firms and research organisations in those innovation systems are more functionally integrated into national or even international innovation systems. There is a large amount of interaction with organisations outside the regional innovation system.

The regionally-networked innovation system presupposes a strong commitment by the local or regional government to support innovation or the infrastructure for innovation. Furthermore, public action aims at strengthening the links and interactions between firms and other organisations, such as, universities and research organisations. Elsner (2001) calls this type of economic policy “interactive economic policy”. The interactive economic policy approach is a new approach to policy intervention that underpins the broader conception of an “institutionalist negotiated economy”. Elsner (ibid.) argues that co-operation is hindered by social dilemma structures of the prisoner’s dilemma (PD) type. The consequence of those PD structures is that private agents fail to coordinate their efforts towards the provision of commonly used infrastructure, such as, transfer services or incubator centres. Those common infrastructures can be interpreted as merit good. Those merit goods have an important role for the community or region since they improve the infrastructure and therefore the preconditions for innovation. Elsner (ibid, p. 71) proposes that “the economic policy agent may employ instruments related to the interactive process of the private agents to change interactions aimed at accelerating and stabilizing the provision of the merit good through promoting coordinated action and cooperation or aimed at initiating this process should it be completely locked in”. This implies that the economic policy agent has to weaken the dilemma structure. This can be done by changing the pay-offs or the discount parameter. Co-operation becomes more likely and stable when it is rewarded. Furthermore, if the economic policy agent is able to increase the likelihood that the private agents meet again in the future – that is, the higher the discount parameter becomes – the less the increase of the relative rewards for cooperative behaviour needs to be. The discount parameter in PD settings measures the weight allocated to a future pay-off and can be interpreted as the probability of a future interaction among the same agents. Thus, if future interaction becomes more likely, for instance, through efforts by the economic policy agent to increase the links and networking between private firms, cooperation becomes likely and stable. This allows for a “leaner” type of economic policy since this type of policy intervention increases networking between the economic agents in order to facilitate cooperation. Networking involves traditional public subsidies to a lesser extent.

Thus, with regard to the empirical analysis of innovation it is important to identify the most important organisations that exist in the innovation system and the patterns of interaction have to be sorted out. This is not an easy task since relations between different organisations are quite complex and can be characterised by reciprocity, interactivity and feedback mechanisms. Furthermore, since interaction between individuals and organisations are governed by formal and informal institutions, the institutional framework has to be taken into account. The purpose of this paper is exploratory. A number of questions deserve further attention:
• How can the regional innovation system with respect to academic start-ups in Heidelberg be characterised?
• What kind of support does the public infrastructure offer to start-ups?
• Is the aim of regional policy to establish and develop networks that support start-ups?
• Are there public funds available to support start-ups?
• How strong are the network ties?

2. Method

This chapter describes the chosen methodological approach. A qualitative case study method was chosen since this approach fits the exploratory purpose of this paper quite well and it “allows an investigation to retain the holistic and meaningful characteristics of real-life events” (Yin 1994, p. 3). Thus, it has to be stressed that the ability to generalise from the case study of Heidelberg is limited. It is based on desk research and interviews.

An interview-based study involves four methodological issues in accordance with Siegel et al (2003). First, issues concerning the sample selection have to be taken into account. Second, the nature of the interview questions plays an important role. Third, the researcher has to elaborate on the procedure for conducting the interviews. Fourth, the qualitative data analysis has to be addressed. The four issues will be discussed in turn.

First, a sample has to be selected. A relevant issue in this context is which persons are able to provide information that is important for answering the research question. Stakeholders from universities, technology transfer offices (TTO) and other public bodies dealing with the support of academic entrepreneurship were chosen. In addition, interviews with entrepreneurs were conducted to get an idea about how they perceive infrastructure and the support of entrepreneurship.

Second, the theoretical framework was used to design an interview guide. Six semi-structured interviews were conducted: four interviews with stakeholders from the public/TTO-side and two interviews with entrepreneurs. Additional data was collected through Internet research and other sources. Interviewees were asked the same questions, although some questions were tailored to a particular group. According to Siegel et al (2003), the best approach for an exploratory study is to ask open-ended questions, such as “what is the role of your organisation” or “how could the situation be improved”. During the interviews, a “steering” or channelling of the answers was avoided.

Third, the procedure for conducting the interviews requires attention. The interviews were face-to-face interviews. In the literature it is claimed that this type of interview is the best way when conducting an inductive study on a controversial topic. Face-to-face interviews have a number of advantages. It is possible to ask a number of complicated
questions and it is possible to reduce obscurities through additional information. It is easier for the respondent to answer open questions and the trustworthiness of the answers increases due to the development of a personal relation during the interview. A number of disadvantages have to be taken into consideration. Face-to-face interviews are rather expensive and time-consuming which limits the number of interviews that can be conducted in such a way. In addition, interviewer effects can occur since the personal relation can impact on the answers. There is a risk that the interviewees answer the questions in the way that they think the interviewer expects or “likes”.

Fourth, there are a number of different stages of qualitative data analysis according to Miles & Huberman (1994): data reduction, data display, and conclusion drawing/verification. The different stages are intertwined and can be characterized as a continuous, iterative process. According to Miles & Huberman (ibid., p. 10), “data reduction refers to the process of selecting, focussing, simplifying, abstracting, and transforming the data that appear in written-up field notes or transcriptions”. It is a part of the analysis and depends pretty much on the researcher’s judgement which data to include in the transcript and which data to exclude. Data reduction sharpens, sorts, focuses, discards and organizes data in such a way that conclusions can be drawn. In this study, all interviews were taped and transcribed roughly focusing on the essence of the content of the interview. The second stage in the analysis is data display. “Generically, a display is an organized, compressed assembly of information that permits conclusions drawing and action” (Miles & Huberman ibid., p. 11). The first type of data display in this study is the transcriptions of the interviews. This provides a first display of the (reduced) interview data. To summarize the data from the interviews and to display the data in a more comprehensive and accessible way, diagrams illustrating the relations between the different actors were developed. As mentioned by Miles and Huberman, data display is an integral part of the analysis. It eases the drawing of conclusions. The third stage is conclusion drawing and verification. Miles & Huberman (ibid., p. 11) claim that “from the start of data collection, the qualitative analyst is beginning to decide what things mean – is noting regularities, patterns, explanations, possible configurations, causal flows, and propositions.” In the process of conclusion drawing and verification, conclusions are also verified as the analysis proceeds. The analysis of the transcriptions revealed a number of common issues that emerged in most of the interviews.

3. CASE STUDY: ENTREPRENEURSHIP POLICY IN HEIDELBERG

Four organisations representing the “supply side” of entrepreneurship support were studied in more detail. Interviewees were representatives for the Office of Technology Transfer of the University of Heidelberg, the Start-up Centre of the University of Applied Sciences (Fachhochschule) Heidelberg, the CEO of the Technology Park Heidelberg, and a representative for EMBLEM which is the technology transfer subsidiary of the European Molecular Biology Laboratory (EMBL). Interviews with representatives for those organisations were conducted in order to get an impression about the services offered to entrepreneurs in Heidelberg.
Heidelberg has about 140,000 inhabitants and is the fifth-largest city in the federal state of Baden-Württemberg. Heidelberg is part of the metropolitan region Rhein-Neckar including Mannheim and Ludwigshafen with totally 2.4 million inhabitants. Heidelberg is well-known for its academic environment and tradition. The University of Heidelberg is the oldest university in Germany founded in 1386. About 27,700 students are enrolled of which 5,000 in medicine, 5,800 in mathematics and natural sciences, 5,000 in law, economics and social sciences, 500 in sports, 800 in art, and about 10,600 in language and cultural studies. Thus, the university offers a rather broad field of studies. The University of Applied Sciences is a private university and was established in 1972. It offers studies in, for instance, business administration, electrical engineering, mechanical engineering, facility management and social work. In addition to the university and the university of applied sciences there are a number of public non-university research institutes, such as the German Cancer Research Center (DKFZ), the European Molecular Biology Laboratory (EMBL), the Max Planck Institute for Nuclear Physics, the Max Planck Institute for Astronomy, the Max Planck Institute for Medical Research, and the Max Planck Institute for Comparative Public Law and International Law.

The technology transfer office (TTO) of the university takes care of the knowledge and technology transfer of the university, in particular the organisation of fairs, legal advice with regard to and handling of industrial funding contracts, management of co-operations with industry, university patenting and start-ups. Since the abolishment of the university teachers’ privilege which gives the ownership rights in university inventions to the university, the TTO takes care of the invention disclosures. However, the invention disclosures are forwarded to the patent and exploitation agency TLB GmbH that takes care of the commercial appraisal and the patent application. The TTO provides information with regard to public support programmes (e.g., EXIST-Seed, Junge Innovatoren) and is usually the first contact point for university researchers or students who think about a start-up. The TTO provides advice and a first critical assessment. The university has its own Start-up centre which was established 2004. The Start-up centre offers subsidized office space. The first year of stay in the Start-up centre is free of charge. The rental fees increase subsequently. The regular rental fee is due four years after establishment of the firm in the Start-up centre. The subsidized incubator services are possible due to a private-public partnership including the university, the Technology Park and a private real estate company. For start-ups in the field of medical engineering and technology there is the possibility to receive support from a consulting firm that has a basic agreement with the university’s TTO and that provides advice regarding commercialisation, subsidies or R&D grants or interim management services. Furthermore, the Start-up centre offers a coaching programme for founders and legal services (costs borne by university TTO) for students or researchers who plan to start a company. Direct financial support to start-ups is very limited.

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2 For an analysis of the effects of the university teachers’ privilege on patenting, see Sellenthin (2006).
3 For the commercial exploitation of inventions from the medical faculty and the university hospital, there is a cooperation with DKFZ and EMBLEM.
The major instrument of the local government of Heidelberg to support academic entrepreneurship is the Technology Park. It was established in 1985 as a business incubator. It is owned by the City of Heidelberg and the Chamber of Commerce Heidelberg. The Technology Park offers around 50,000 square meters of office and laboratory space. Part of the space is financed by the DKFZ. The office and laboratory space is let by a private real estate company. The Technology Park is the home for approx. 75 firms and organisations employing approx. 1,300 persons, including research organisations of the university and DKFZ. Major focus of the Technology Park is the life sciences plus IT and environmental sciences. The Technology Park supports the early phases of firm development. Limited financial resources from the Technology Park are available in the form of loans. However, the main services offered are related to office space and networking. The Technology Park cooperates with the university and its Start-up centre. The CEO of the Technology Park is a higher bureaucrat of the City of Heidelberg. The Technology Park decides what companies can rent office and laboratory space. The Start-up centre of the university includes also firms that are in a very early phase of development whereas the firms in the Technology Park are already in a later stage of firm development. The local government and the Technology Park offer coaching and try to connect the entrepreneurs with the right people. As argued by the CEO of the Technology Park:

“We all know each other here [in the region of Heidelberg]. To have contacts, to provide trust and to solve problems on different levels is our job!”

The University of Applied Sciences Heidelberg (FH Heidelberg) has its own Start-up centre. The Start-up centre promotes not only start-ups from the FH Heidelberg, however, due to the local proximity, the vast majority of start-ups is from the FH Heidelberg. The Start-up centre was established in 2001 and offers advisory services in the early phase of firm establishment. The services are free of charge but successful firms frequently “pay” for the services in the form of donations. The Start-up centre supports founders during the development of a business plan, it offers office space and acts as broker with regard to other supporting services. This includes legal services, management services and even financing of the firm. The CEO of the Start-up centre has a number of personal ties with a venture capital fund and a consulting company for medium-sized enterprises. There is a close cooperation with a legal firm that offers advice with regard to patenting and firm establishment. Particularly interesting is the networking approach of the Start-up centre. Its founder and CEO is at the same time CEO of a consulting firm for medium-sized enterprises and he is member of the advisory council of a venture capital fund. Furthermore, persons who want to establish a firm can get legal advice from a lawyer who at the same time is member of the supervisory board of the Start-up centre. The venture capital fund and the consulting firm are themselves linked through memberships in supervisory boards. Figure 1 shows the relation between the different actors in the network.
As Figure 1 shows, the different parties are closely related and intertwined. The CEO of the Start-up centre argued in this context:

“There is a difference between networking and networking. I have direct resources since I can directly influence the allocation of financial resources to entrepreneurs. … Networking is most important, however, in my case it is hard-fact-networking. Our contacts are based on long-time collaboration. That is very hard fact what we are doing here!”

Heidelberg is known for its strong institute sector. Particularly important are DKFZ and EMBL. EMBLEM is the subsidiary of EMBL and is responsible for technology transfer. It was established in 1999 (operative since 2001) and employs seven employees – most of them with many years of industry experience. EMBLEM regards itself as one-stop-shop for EMBL scientists with regard to commercialisation. They take care of a large range of possible technology transfer activities including contract research, licensing and spin-off. EMBLEM provides also incubator services including access to office and laboratory space. Ten companies are located in the incubator. There is also access to venture capital through EMBL Ventures that takes care of the EMBL Technology Fund. As subsidiary of EMBL, EMBLEM is organisationally and legally separated from the basic research
activities. EMBLEM covers its own costs. EMBLEM cooperates with the technology transfer unit of DKFZ. As already mentioned, EMBLEM and DKFZ take care of the technology transfer activities of the medical faculty and the university hospital.

A rather recent initiative is the “Gründerverbund Heidelberg e. V.” (founder network) which links the major organisations dealing with entrepreneurship support in Heidelberg. The Gründerverbund includes the University of Heidelberg, DKFZ, EMBLEM, Technology Park and the Start-up centre of the University of Applied Sciences. The Chamber of Commerce is associated member. The Gründerverbund focuses explicitly on high tech firm foundations. As indicated by the interviews, the Gründerverbund is one way of formalising the already existing informal ties between the organisations supporting entrepreneurship in Heidelberg.

Thinking in networking terms is quite frequent for the actors in the supporting infrastructure. The actors that support entrepreneurship try to link entrepreneurs to persons and organisations that can provide them with help and support, for instance, guidance and capital. A typical statement from one of the interviewees is:

“A typical mistake made 10 or 15 years ago was to try to equip the scientist with additional know-how in order to make him a universal businessman. Normally, this results in excessive demands of the scientist. ... The challenge of technology transfer is to provide a comprehensive support network to the founder of a firm.”

In sum, as the interviews with actors representing the “supply” side of entrepreneurship support suggest, there are a number of organisations providing support with respect to the establishment of new enterprises and business development. However, financial subsidies or grants are limited. Table 1 provides an overview of the structural characteristics of the different organisations.

**Table 1. Structural characteristics of the support organisations in Heidelberg**

<table>
<thead>
<tr>
<th></th>
<th>University TTO/Start-up Centre</th>
<th>FH Heidelberg/Start-up Centre</th>
<th>EMBLEM</th>
<th>Technology Park</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employees dealing with start-ups</td>
<td>1</td>
<td>1</td>
<td>7</td>
<td>3.5</td>
</tr>
<tr>
<td>No. start-ups in incubator</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>75 (including public research organisations)</td>
</tr>
</tbody>
</table>

*Source: Based on the interviews.*
Two companies representing the “demand side” of entrepreneurship support were interviewed in order to get an impression about perceived problems, challenges etc. with respect to entrepreneurship support. The first firm was established in 2000 in the biotechnology sector. The second firm was established in 2006 in the field of science and university marketing. Obviously, since both firms were established in totally different industries, their need for support was different as well. Entry barriers with regard to funding seem to be particularly high in biotechnology which means that the demands to acquire funding for the early phase of firm development are particularly high. In contrast, funding constraints were rather low in the case of the university marketing company. The founders received grants that partly covered their wages in the first couple of months from the German federal labour office. In addition, the company received office space in the Start-up centre of the university which meant quite favourable rental conditions.

The entrepreneurs were asked what kind of support they received from the public infrastructure. The biotech spin-off received a grant through a federal biotechnology competition (BioRegio). Venture capital was provided through a public bank that is owned by the federal state. Furthermore, the company received a biotech grant from the federal state.

The firm rented office and laboratory space to favourable rental conditions in the Technology Park. In general, as the interview with the founder indicated, the biotechnology start-up had rather limited contacts to the public support actors. It was established by a scientist from one of the non-university research organisations and the founders “bought” legal and tax advice via the market from tax consultants and lawyers.

The university and science marketing spin-off received a grant that covered their living costs in the first nine months from the German federal labour office. The marketing start-up was established from scientists from the university who had intense interaction with the university TTO prior to the establishment of the firm. They received advice and guidance from the TTO and office space in the Start-up centre of the university. The founders received coaching with respect to business skills from the German federal labour office. The founders of the start-up received feedback with regard to their business plan from the Chamber of Commerce.

4. Analysis

The analysis of the interviews and desk research shows that there are a number of different organisations that support entrepreneurship in Heidelberg. Figure 2 provides an overview of the different actors.

Start-ups can basically receive support from three different political and administrative levels: the national (federal) level, the regional level (Länder-level) and the local level.

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4 The interviews are presented very briefly since confidentiality was agreed.
There are a number of national support measures that promote academic spin-offs and start-ups. The largest programme is the EXIST-Seed initiative. It promotes researchers from universities and public research organisations and students that plan to establish a firm. It offers scholarships for founders holding a PhD (2 500 € per month), university graduates (2 000 € per month), and students (800 € per month). In addition, applicants can get coaching for up to 5 000 € and 10 000 € for tangible means. The duration of the scholarship is limited to one year. In addition, there are initiatives for particular industries, for instance, the BioRegio support measure for biotechnology. Furthermore, entrepreneurs who establish an enterprise can receive financial support from the German federal labour office. The grant from the German federal labour office covers partly the wages of the entrepreneurs for a limited time.5

FIGURE 2. ENTREPRENEURSHIP SUPPORT IN HEIDELBERG

5 The grant to support the establishment of a firm from the German federal labour office is separated in two phases. In the first nine months, the founder of a firm can receive a grant that is as high as the unemployment compensation plus 300 € for social insurance. In the second phase which is up to six months, the founder can receive 300 € for social insurance.
On the regional level (Länder-level), there is the possibility that academic entrepreneurs receive a part-time contract for up to two years in the programme “Junge Innovatoren” (“Young Innovators”). They can use office and laboratory space of the university free of charge and can get coaching with respect to business skills. On the local level, entrepreneurs can receive subsidized office and laboratory spaces and other incubator services at the Technology Park.

Most of the research organisations in Heidelberg have their own TTO. However, the recently established Gründerverbund indicates that cooperation between the support organisations is stressed.

The interviews have indicated that there are a number of private actors and organisations in Heidelberg that support entrepreneurship. It was stressed from the interviewees that Heidelberg is a rich region with business angels that support promising firms.

A number of research questions were raised in the theoretical part of this paper. They will be answered subsequently below.

- How can the regional innovation system with respect to academic start-ups in Heidelberg be characterised?

The regional innovation system in Heidelberg has elements of a regionalised national innovation system and a regionally networked innovation system as characterised by Asheim (1998). It is clear that there are a number of policy interventions on the local level. It was shown that there are a number of initiatives and measures from public policy makers that aim to improve networking in the region. However, there are also a number of public measures and initiatives on the national level that have an impact on academic entrepreneurship in the Heidelberg region. Examples of national (federal) measures are EXIST-Seed, BioRegio and the grants of the German federal labour office.

- What kind of support does the public infrastructure offer to start-ups?

The actors in the public infrastructure offer guidance with regard to the different steps of firm establishment and development. The TTOs and other intermediaries are usually the first contact points of the prospective entrepreneurs. They assess the commercial potential, and provide links to other actors that can provide support. For instance, if the TTO sees commercial potential, they can help with regard to the acquisition of public grants or provide contacts to venture capital firms. The Start-up centres of university and university of applied sciences (FH Heidelberg) can provide legal advice through network partners. The interviewees made apparent that the personal links of the individuals working at TTOs and the intermediaries are quite important. It seems that the different actors in the Heidelberg region know each other well.

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6 Beneficiaries of the Junge Innovatoren programme get a half-time contract. Payment is approx. 1 500 – 2 000 € per month depending on age, number of children etc.
Is the aim of local policy to establish and develop networks that support start-ups?

With regard to the type of economic policy on the local level, it becomes apparent that the public economic policy agents in Heidelberg focus on networking and to a lesser extent on traditional support measures, such as public subsidies. The extent to which entrepreneurs can receive financial resources from public sources is limited. The case study of Heidelberg has shown that the technology transfer offices and similar public agents provide guidance during the process of firm establishment. This means also that they frequently connect the entrepreneurs with other agents and organisations that support and finance newly-established firms. In some cases, the public support organisation has the possibility to provide public funds as well. However, the size of those funds is rather small. Thus, the economic policy approach towards the support of entrepreneurship can be regarded as a lean approach, however, whether this approach is lean by deliberate design or the result of missing public resources remains unclear. Thus, it can be argued that the local innovation policy follows an “interactive economic policy” approach as defined by Elsner (2001).

One of the interviewees characterised his work as “hard-fact networking”. That means that the supporting organisations do not only link the entrepreneur with other supporting actors that provide further support, for instance, capital or consulting services, but have direct influence on the disposition and allocation of resources. These direct influences are channelled through personal connections and memberships in different boards or advisory councils.

Are there public funds available to support start-ups?

Public funds are available on the federal and the regional (Länder) level. Local public funds to support entrepreneurship are very limited.

How strong are the network ties?

It seems that the network ties of the Start-up centre of the university of applied sciences (FH Heidelberg) are quite strong. The different partners in the network are intertwined through membership in different supervisory and scientific advisory boards. Furthermore, the actors know each other for some time. This safeguards that members of the network meet again which reduces the importance of the PD setting. The links between the other public organisations fostering entrepreneurship are not as strong. However, the recent establishment of the Gründerverbund is likely to improve networking.

The interviewees were asked about particular positive things with regard to entrepreneurship and start-up support in Heidelberg. One general argument was that the science cluster, in particular with respect to the life sciences, is working extremely well in Heidelberg. There are a number of large and successful research organisations in Heidelberg that perform good scientific research. A number of respondents claimed that there is a very
large commercial potential in Heidelberg particular in the life sciences. The DKFZ and EMBL were frequently regarded as outstanding research organisations with large commercial potential. Furthermore, the recent networking initiatives that bring together different actors dealing with technology transfer (e.g., Gründerverbund Heidelberg) were praised. The different start-up initiatives and incubators (Start-up centre of the university and Start-up centre of the university of applied sciences) were mentioned as positive examples in Heidelberg. Another positive aspect mentioned by the interviewees is the fact that the region of Heidelberg is quite rich in national comparison and that there is access to venture capital and seed funding from business angels.

However, despite the recent positive developments in Heidelberg there are still a number of deficits with regard to technology transfer. It was argued by the majority of interviewees that despite the large commercial potential in Heidelberg the vast majority of this potential is not commercialised. One reason could be that the networking between the different technology transfer actors is not working sufficiently well. Particularly problematic seems the technology transfer of the University of Heidelberg according to a number of respondents. It was claimed that the there is less networking within the university. There are still departments that are struggling with the technology transfer unit of the university since they do not see why the university should have a TTO at all. This is related to the fact that a large share of research of the university of Heidelberg is not relevant for commercial exploitation since the university has a broad focus including humanities and social sciences. It was argued that research institutes such as DKFZ and EMBL do not have the same attitude problems with regard to technology transfer since the research results of such institutes are more relevant with regard to commercial exploitation than the majority of research results from the university. Furthermore, it was argued that the technology transfer from the university could be improved but that financial resources are missing to a considerable extent.

**CONCLUSION**

This paper was an attempt to explore the ways in which academic start-ups get support from the public infrastructure in Heidelberg. It builds on a rather small number of interviews and provides a rather crude picture about entrepreneurship support. It has to be stressed that the results can not be generalised due to the limited number of interviews. Nevertheless, it was shown that there is a network of TTOs, Start-up centres and public policy initiatives on the local level that provide support to entrepreneurs and academic start-ups. The public policy agents (e.g., Technology Park), the TTOs and Start-up centres provide guidance and try to channel the entrepreneurs to the appropriate people and organisations. This type of networking builds upon personal ties and long term experience with collaboration to a large extent. In order to assess innovation and entrepreneurship support in more detail, the number of observations or interviews has to be extended. More interviews with entrepreneurs should be conducted in order to increase the reliability of the results.
REFERENCES


**Interviews**

Interview with representative for the TTO of the University of Heidelberg, held November 28, 2006.

Interview with CEO Technology park Heidelberg, held December 12, 2006.

Interview with founder of university and science marketing company, held February 15, 2007.

Interview with CEO Start-up centre of the University of applied sciences Heidelberg, held March 7, 2007.

Interview with representative for EMBLEM, held March 7, 2007.

Interview with founder of biotechnology company, held April 24, 2007.