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Regional Innovation Policy beyond 'Best Practice': Lessons from Sweden

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Abstract

This paper deals with policy measures in the regional innovation system of Scania, Southern Sweden. Focus is dedicated to requirements on innovation policy from actors representing different industries. Previous studies have identified profound differences with regard the organization of knowledge sourcing between firms and other actors in industries drawing on different knowledge bases. In correspondence with these findings, industries differ also with regard to how policy measures aiming to support innovation are perceived and acquired. Despite this, there is a tendency among regional policy programs to base their strategies on one 'best practice'-model, inspired by successful (or sometimes less successful) cases in other parts of the world. The paper presents an in-depth analysis of such policy support targeting three industries located in one region, and ends with a suggestion to how those should be adapted to render influence on the institutional framework of the regional innovation system.

Keywords: innovation policy, regional innovation systems, knowledge bases, Sweden

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This paper deals with policy measures in the regional innovation system of Scania, Southern Sweden. Focus is dedicated to requirements on innovation policy from actors representing different industries. Previous studies have identified profound differences with regard the organization of knowledge sourcing between firms and other actors in industries drawing on different knowledge bases. In correspondence with these findings, industries differ also with regard to how policy measures aiming to support innovation are perceived and acquired. Despite this, there is a tendency among regional policy programs to base their strategies on one 'best practice'-model, inspired by successful (or sometimes less successful) cases in other parts of the world. The paper presents an in-depth analysis of such policy support targeting three industries located in one region, and ends with a suggestion to how those should be adapted to render influence on the institutional framework of the regional innovation system.

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Introduction

This paper deals with policy measures in the regional innovation system of Scania, Southern Sweden. Particular focus is dedicated to assessing needs and demands on innovation policy from actors representing different industries, and the extent to which existing regional policy programs have managed to meet these needs and demands.

Previous studies have identified profound differences with regard to the modes of innovation and the organization of knowledge sourcing between firms and other actors in industries drawing on different knowledge bases (Moodysson, Coenen and Asheim 2008, Asheim and Gertler 2005). In correspondence with these findings, different industries are expected to differ also with regard to how policy measures aiming to support innovation are perceived and acquired. Summarizing the differences as regards modes of innovation it can be said that knowledge sourcing and inter-organizational collaboration in geographical proximity is especially important for industries that rely on a synthetic or symbolic knowledge base, since the interpretation of the knowledge they deal with tend to differ substantially between places. This is less the case for industries drawing on analytical knowledge, since such knowledge is codified, abstract and universal. Knowledge sources related to scientific knowledge and principles are particularly important for analytical industries, whereas synthetic industries rely more on experience-based learning and applied R&D, and symbolic industries on creativity and non-scientific knowledge (Asheim and Coenen 2005).

We argue that regional innovation policies should take these differences seriously into account in order to provide appropriate support, shaping good conditions for innovation to take place. However, there is a tendency among regional policy programs to base their strategies on one 'best practice'-model, neglecting such industry-specific needs and preconditions (Hansen and Winther 2010). This paper presents three existing regional innovation policy programs supporting three different industries located in the same region, and analyses to what extent these have been fine-tuned to the needs and demands of the respective industry. The knowledge base approach serves as conceptual framework and principle for selection of cases. Main questions addressed in the paper are thus (1) how needs and demands differ between industries with different knowledge bases, (2) whether the existing policy support programs meet these distinct needs and

demands, and, partly as a consequence of the previous, (3) whether the existing policies succeed to become an integrated part of the institutional framework of the regional innovation system.

Research design

The three industries under study are (1) the life science industry, (2) the food industry[1], and (3) the moving media industry. The empirical cases are clusters of firms, representing these three industries, located in the southernmost province of Sweden. Main method for data collection is structured interviews with representatives of the firms. A total of 95 structured interviews were conducted; 30 for the life science industry, 28 for the food industry, and 37 for the moving media industry. This equals a response rate of 72% of the source population for the life science cluster, 80% for the food cluster, and 50% for the moving media cluster.[2] The main aim with these interviews was to find out what type of support the firms perceive they would need from the policy programs and what they perceive the policy programs provide in response to those needs.

To find out more in detail what the existing policy programs targeting these clusters claim to provide in terms of support, document studies were combined with in-depth interviews with key individuals representing the regional policy programs. A total of 15 such interviews with policy makers were conducted. Additional input for assessing the policy programs was received through participation in focus group meetings involving representatives of the regional council, one of the main stakeholders responsible for the design and implementation of these programs. Eight such meetings were held during the period February 2009-March 2010. Through this combination of different strategies for data collection we were able to assess both the actual correspondence between firms' needs and policy supply, and the perceived correspondence from the point of view of the target population (the firms).

[1] The study is limited to a specific sub-segment of the food sector, including firms working specifically with development of new products and/or processes related to food production. A large amount of food producing companies is hence excluded from the sample.

Conceptual framework

With the aim to generate economic growth, regional authorities are increasingly engaged into designing innovation friendly framework conditions. This emphasis on innovation in regional policy was initially triggered by the recognition that regions can no longer compete only by offering basic technical infrastructure, skilled labour and financial incentives in order to attract investors. Policies following such a traditional approach have proven to be rather ineffective when it comes to solving the current problems of unfavoured regions. The central problem of many old industrial and declining regions is a low performance as regards innovation. If firms are unable to innovate and unwilling to change, the regional economy risks to lock into a development path which is, although perhaps previously successful, little promising for the future. In order to create sustainable economic growth, regions need to redefine themselves continuously and change towards more auspicious trajectories.

With the purpose to foster innovation and change, regional policy makers are typically advised to promote and support interactive learning and cooperation in the local sphere. This is in line with one of the key arguments in the literature on regional innovation systems, which is that regional growth and competitiveness is dependent on the ability of local actors to exchange knowledge and build networks. Important actors in this respect are private firms, governmental agencies as well as universities and other public research organisations. The regional innovation systems approach thereby emphasizes the importance of networking and considers the firm as having the leading role in innovation (Cooke 1996). Very much related, the triple helix model describes a spiral trilateral interaction between academia, industry and government, and thereby stresses the role that universities can play for economic development. Universities, government and industry are learning to promote economic growth within a specific local context through the development of what is called ‘generative relationships’, that is loosely arranged reciprocal relations between actors that persist over time (Etzkowitz and Leydesdorff 1997).

Both the RIS and the triple helix approach emphasize the crucial role of networks and relations between learning counterparts. The importance of

[2] A desktop-based non-response analysis revealed no systematic differences in terms of size, age and type of activities between responding and non-responding firms.

networking for innovation is also supported by Lambooy and Boschma (2001) who define two objectives for regional policies – efficient capital markets and good access to information and stimulation of economic actors' innovative capabilities though networking and interactive learning. This goes in line with Schwerin and Werker's (2003) argument that innovation policy should support knowledge networks in a non-selective manner. As a consequence, regional polices tend to focus strongly on designing framework conditions for knowledge exchange as their main measure of innovation support. However, what is often missed in theoretical discussions is that actors within these networks differ depending on the industry to which they belong, partly as a consequence of their specific knowledge base characteristics. This implies different barriers to innovation, and it follows that, in order to succeed, policies need to account for such specific needs and characteristics of their target industry.

Regional Policy and institutional framework conditions

Despite the fact that there is a wide acceptance among researchers as well as policy makers that societal institutions matter in economic operations by defining beneficial or hampering framework conditions, there is neither consensus on what is meant by institutions, nor how institutions matter more precisely (Hollingsworth 2000, Peck 2000). To begin with, institutions and organizations are not the same. Institutions are considered to be the rules of the game, relatively enduring features of political and social life that shape, constrain and structure the behaviour of organizations (universities, firms, governmental agencies etc.) and individuals (North 1990, Mahoney and Thelen 2010a). Sheingate (2010) argues that institutions are *constraining* insofar as they establish parameters for action, but they are also *empowering* individuals to develop innovation in practice. Without such rules any action becomes impossible.

Many studies of institutional change analyse the possibilities for institutional innovations due to interpretation and application of existing rules (Mahoney and Thelen 2010b). This is also the context in which Sheingate grounds his arguments. However, in the case of innovation policies, institutions have a direct impact on innovative actions. One example of ambiguous relations between constraining and empowering is a financing system for new research activities. By prioritizing some research areas or collaboration forms more than others, the

financing system constrains research development. However, financial resources are essential input for any research to be performed and in this way it also empowers innovative behaviour.

On a more general level, North (1990) classifies institutions into formal (i.e. officially stated) and informal. The latter are not necessarily explicitly communicated but rather shaped by common social context and implicitly perceived by the actors. Scott (1995) specifies institutions even more detailed and separates regulative, normative and cognitive ones. Regulative institutions represent rules and laws that work as coercive mechanisms and are legally sanctioned. Normative institutions are values, norms, codes of conduct, not legally sanctioned but morally governed. Cognitive institutions are beliefs and models of reality taken for granted and supported by culture and everyday practices. These should thus be understood as interdependent and mutually reinforcing pillars, which, seen as a whole, define the institutional framework within which economic actors function and interact (Moodysson 2007).

Regional policies are most often designed by regional authorities with the aim to become a part of the regional institutional framework and influence regional development. Since regional authorities do not have legislative power in Sweden, they do not have direct influence on the formation of regulative institutions. However, they are responsible for regional development and planning in the areas of industry, communication, culture and cooperation with other regions within and outside Sweden. In this way regional policy actors influence the preconditions for economic performance of the region and contribute to creating normative – constraining and enabling – institutions for many activities (Egstrand and Sätre 2008). Thus they also, in an indirect manner, influence the regulative framework. It follows that regional policies, if successful, become an active part of the normative and to some extent regulative institutional framework within which industries operate. This is also at the heart of the regional innovation systems approach to analyses of economic performance of regions.

As noticed by Mahoney and Thelen (2010b) rules (i.e. institutions) are not just designed but also have to be applied and enforced. It follows that the rule is successful only if the actors whom it targets comply with the rule (Knight 1992). Cognitive institutions are perceived unconsciously, so actors do not think about not complying (Mahoney and Thelen 2010). In the case of regulative institutions

compliance is enforced by law and the perception that non-compliance might be very costly. However, normative institutions come into being only if actors perceive that certain norms and codes of conduct are beneficial for their performance and meet conventional conception of fairness (Hall 2010). The central challenge for regional innovation systems policy is thus to promote such compliance with the rules, regulations, norms and patterns of cognition defining the institutional framework of the system. Regional innovation system policies will thus feed into the institutional framework in a fruitful way only if they meet practical, appropriate and sensible requirements (Campbell 2006).

Regional innovation policies primarily aim at changing norms within the region, by promoting collaboration, learning and knowledge exchange (Nauwelaers and Wintjes 2002). We illustrate below how these differ between different industries, even though being part of the same regional innovation system.

Industry needs as a consequence of the crucial knowledge base

Demands of the actors (firms) might be assessed in an indirect manner through studying the actual involvement of industry representatives in various forms of activities initiated by the support structure of the regional innovation system. Another, in our view more fruitful approach, would be to assess the demands in a more direct way, simply by asking the firms what they demand from policy. Identification of real needs is more complicated, since companies do not necessarily know what their real needs are. Consequently, only satisfying the explicitly communicated demands of target groups might lead to fatal mistakes (Christensen 2000) in which the policy support program contributes to creating a lock-in situation.

To deal with this (potential) problem, the empirical assessment of firm demands through interviews is combined with a theoretically based assessment of needs derived from the main arguments of the so called knowledge base approach (Asheim and Gertler 2005). We argue that this approach, through clarifying different preconditions for innovation in different industries, can serve as a heuristic model for designing fine-tuned regional innovation policy. To explain patterns and modes of innovation in different regions, industries or firms, a distinction is made between three different types of knowledge base, namely

analytical, synthetic and symbolic. It is important to say that this distinction is intended as a mode of conceptual abstraction. In practice, most activities will comprise more than one knowledge base, and the degree to which a certain knowledge base prevails can vary substantially between different activities (Asheim and Hansen 2009, Asheim et al. 2007a). Nevertheless, the distinction has proved to be very useful for specifying and explaining differences between different economic activities in an ideal-typical manner. The main characteristics of respective knowledge base are described in the following.

An analytical knowledge base is dominant in economic activities where scientific knowledge is important, and where knowledge creation is primarily based on formal models, codified science and rational processes (Asheim and Gertler 2005). Examples mentioned in the literature are genetics, biotechnology, and information technology (Cooke et al. 2007), whereas the present study focuses on the life science industry. For analytical industries, basic as well as applied research are important activities, and new products and processes are developed in a relatively systematic manner. Firms usually have their own research and development (R&D) departments, but rely also on knowledge generated at universities and other research organisations. For that reason, linkages between private firms and public research organisations are considered as particularly important and take place more frequently than in other industries. Since analytical industries deal with scientific knowledge stemming from universities and other research organisations, they depend to a large extent on codified forms of knowledge which are written down in scientific publications and in patents. These forms of knowledge are relatively easy to share and exchange over long distances. Therefore, knowledge sourcing in these industries is assumed to take place on a wide geographical scale, often within globally configured networks.

A synthetic knowledge base prevails in industries that create innovation through use and new combination of existing knowledge, with the intention to solve concrete practical problems (Asheim and Gertler 2005). Examples mentioned in the literature are plant engineering, specialized industrial machinery and shipbuilding (Cooke et al. 2007), while the present study focuses on innovative food production. In these industries, formal R&D activities are of minor importance; innovation is driven by applied research or more often by

incremental product and process development. Linkages between university and industry are relevant but occur more in the field of applied R&D and less in basic research. New knowledge is generated partly through deduction and abstraction, but primarily through induction, encompassing the process of testing, experimentation, practical work or computer-based simulation. Knowledge that is required for these activities is partially codified, however the dominating form of knowledge is tacit, due to the fact that new knowledge often results from experience gained through learning-by-doing, -using and -interacting. In comparison with analytical industries, knowledge networks are assumed to be less globally configured and knowledge sourcing takes place mostly within the national or regional boundaries, be it through mobility of employees or through cooperation with other firms.

The symbolic knowledge base is a third category that is receiving increasing attention in the scientific discourse in view of the growing importance of cultural production (Asheim, Coenen and Vang 2007b). It is present within a variety of industries such as film, television, publishing, music, fashion and design, whereas the example in the present study is the moving media industry. All these activities have in common that they are dedicated to the generation of aesthetic value and images and less to physical goods. Symbolic knowledge can be embedded in material goods such as clothing or furniture, but the impact on consumers and the economic value as such arises from its intangible character and aesthetic quality. Symbolic knowledge also includes forms of knowledge applied and created in service industries such as advertising. Since these industries often produce through short-term contracts and within small project teams, knowledge about possible partners for cooperation and knowledge exchange (know-who) is particularity important. Symbolic knowledge is highly context-specific, as the interpretation of symbols, images, designs, stories and cultural artefacts “is strongly tied to a deep understanding of the habits and norms and ‘everyday culture’ of specific social groupings” (Asheim et al. 2007b). Therefore, the meaning and the value associated with symbolic knowledge varies considerably between places. This reflects also the spatial dispersion of knowledge networks, which are, due to the context specificity of symbolic knowledge, predominantly locally configured.

Empirical studies have confirmed the theory-led expectations of the distinct geography and organisation of knowledge sourcing between industries drawing on different knowledge bases (Martin and Moodysson 2011). Exchange of knowledge in geographical proximity is particularly important for symbolic industries, since the interpretation of knowledge they deal with tends to vary between places. Accordingly, cooperation and knowledge exchange occur above all within locally configured networks. Models and principles stemming from academia have little importance, since innovation is driven by creativity rather than application of scientific laws. Synthetic industries deal to a higher extent with codified knowledge which is less context specific; however the dominating form is still tacit. Therefore, cooperation and knowledge exchange occurs primarily between partners in the same functional region, but actors on the national and global level also play considerable roles. Analytically based industries rely on scientific knowledge that is codified, abstract and universal, and are therefore little sensitive to geographical distance. In line with this, knowledge exchange occurs in globally configured epistemic communities rather than in locally configured, trust based networks (Moodysson 2008, Gertler 2008).

Analysis

This section tests the theoretical claim that taking the crucial knowledge base of industries into account facilitates the proper definition of industry characteristics which in turn leads to improved regional policies, in harmony with the institutional framework of the regional innovation system. This is done in the following way. First, a compressed overview of all three industries within the region is provided. Secondly, existing regional policy support programs, targeting these different types of industries, are discussed with focus on what they claim to provide to the companies within the industry. Thirdly, insights derived from a unique data set on these industries demands and perceived benefits from existing policy support programs are presented. The final part relates the empirical findings with the theoretical implications and analyses how (if at all) the inclusion of the knowledge base approach can help to improve regional policies by clarifying the needs and demands of the actors beyond what is explicitly communicated in the interviews.

Overview of the three industries under study

As stated above, all the three cases analysed in this study are located in the region of Scania, Southern Sweden. The actors are clustered in (or close to) the two cities Malmö and Lund. Malmö is the third largest city of Sweden and Lund hosts the largest university of the country. All three industries are considered to be of high importance for regional development by the regional governmental body Region Skåne (Henning, Moodysson and Nilsson 2010). The cluster of life science is the third largest in Sweden (after Stockholm and Västra Götaland). It contains about 30 research based biotechnology companies focusing on new pharmaceuticals and about the same number of medical technology oriented companies. The majority of biotechnology companies were established after 1995 and are clustered around Lund University and in Ideon or Medeon science parks. The Scanian part of the life science cluster is located merely 45 minutes from the Danish capital Copenhagen, hosting another part of the cluster of approximately the same size.

Scania has a strong national position in food production. One quarter of the country's food industry is located in the region, employing about 25,000 people. The majority of companies are clustered in the western part of the region. Global competition accelerated as a consequence of Sweden's entry to the European Union in 1995, which increased the pressure on the Scanian food industry to develop towards higher added value niche products involving greater knowledge content (Henning et al. 2010). The cluster under study in this paper is composed by such innovative food companies, building their competitive advantage on the ability to produce new and better products through new and better processes. The case study thus merely covers a subset of the food industry in the region.

Moving media is not a single industry, but rather the intersection between industries such as film, television, computer games and mobile technology. This sector is a relatively new niche in the regional economic structure. It experienced strong growth in the beginning of the last decade; drawing on its roots in traditional media and ICT. Most of the companies within the region are very small and quite young. They are located in Malmö's Western Harbour, the same location as large parts of the publicly administered knowledge and support infrastructure targeting this industry (Henning et al. 2010).

Overview of the three regional policy support programs

There are three main policy support programs, targeting these different industries in Scania. Those are Medical Valley Alliance (MVA) targeting the life science industry (analytical knowledge base); Skåne Food Innovation Network (SFIN) targeting the food industry (synthetic knowledge base); and Media Evolution (ME) targeting the moving media industry (symbolic knowledge base). More detailed account on each policy initiative with a focus on what they (claim to) provide to the respective industry is provided below.[3]

Medical Valley Alliance (MVA) started in the middle of the 1990s as a cluster initiative with the aim to stimulate industry-university linkages and bi-national (Swedish-Danish) interaction in the field of life science. It was a result of an EU Interreg project in which Lund University and Copenhagen University took the lead, joined by three of the region's largest pharmaceutical companies and a number of public actors responsible for regional development in Sweden and Denmark (all within the framework of the Öresund Committee, a body for policy cooperation). Initially the initiative's main focus was to increase the integration between the region's two national parts and stimulate cross-border cooperation between companies and universities. With time the focus of the initiative changed and broadened. More concretely, MVA now has several initiatives with possible benefits for their member companies. Some activities, such as MVA annual meeting, MVA golf championship, MVA executive club, primarily aim at social networking between members in the cluster. The MVA Life Science Ambassador program and the Meeting MVA initiative aim at global knowledge exchange between life science companies. It is implemented by exchanging ambassadors between MVA and clusters in Japan, Canada and South Korea that should assist foreign firms in getting in touch with local companies or organizing seminars and conferences on how to do business in respective areas. Thus, together with strengthening cross-national relations and local cooperation in MVA activities, there has been a shift towards international marketing of the region and global networking.

[3] In the remainder of this paper we refer to these policy support programs and the activities they claim to provide, also in the section discussing firms' perceived benefits. It is though important to note that some of these activities are provided through synergies with the broader support structure of the regional innovation system, such as more generically focused science parks, incubators and business support organizations.

Skåne Food Innovation Network (SFIN) was created in the middle of the 1980s in order to increase the food sector's international competitiveness, mainly through connecting the food industry with other relevant industries such as packaging, machinery, logistics and academia. SFIN is involved in human capital and competence development within the industry through presenting the food sector to students during career days and specially organized tours as well as special internship programs. The initiative also assists in opening new innovative markets, supports the development of innovations by facilitating connections with academia and to some extent providing financial support for R&D. They are also engaged in design and development of higher education programs at Lund University. However, the main focus of the initiative is networking and communication among the actors. It runs a ten-year development project Food Innovation at Interfaces, funded by a consortium of state actors (primarily VINNOVA), Region Skåne, Lund University and some food companies in Scania. The overall objectives are to strengthen networks within the industry of Scania, between industry and academia, and to stimulate innovation and growth.

Media Evolution (ME) is a continuation of a policy initiative named Media Mötesplats Malmö – a project which started in 2004 and ran till 2009. It was initiated by Region Skåne, Region Blekinge, the City of Malmö and Scandvision, which is one of the larger companies in the sector. It is an umbrella organization unifying several small initiatives that were present in the region. A key task of the initiative is to strengthen links between traditional and new media for moving images and to serve as a meeting place for actors focused on production, distribution and consumption of new media. More concretely, the initiative (claims to) support the development of the industry by providing knowledge about new market possibilities (e.g. living labs), competence development and social networking (e.g. fairs, conferences, seminars), entrepreneurial consultations, contact and business development and access to venture capital (e.g. incubator). ME also strives to promote the linkages between industry and academia, partly through providing platforms for interaction but also though lobbying and information campaigns towards the university sphere to make them aware of the role of science also for so called creative industries.

The following section outlines the results from the structured interviews with firms composing the moving media, food and life science clusters in Scania.

Firm representatives were asked to specify the type of policy support they require and perceive as relevant for their innovation activities, and describe how they benefit from existing policy programs available in the region.

Demand on policy support

There is a set of different policy measures that can be implemented in order to stimulate innovation in the regional economy. Typical support measures are financial provisions in form of grants for R&D and innovation activities, support for knowledge exchange through various forms of networking, human resource development in form of seminars and training courses, and improved access to knowledge related to technologies or to new developments on the market. The companies were asked what types of policy support they require and perceive as relevant for their innovation activities.

TABLE 1: POLICY SUPPORT DEMANDED BY FIRMS IN DIFFERENT INDUSTRIES

	Life Science (n=30)	Food (n=28)	Moving Media (n=37)	Total (n=95)
Financing	73.3%	53.6%	64.9%	64.2%
Networking	56.7%	17.9%	51.4%	43.2%
Staff training	50.0%	53.6%	48.6%	50.5%
Information about market	46.7%	14.3%	29.7%	30.5%
Information about technology	16.7%	35.7%	40.5%	31.6%

Source: own survey

Table 1 summarizes the types of policy support demanded by firms and reveals both a general trend and industry specific differences. Irrespective of what sector they belong to, firms request policy support programs to identify and mobilize additional sources of funding. Monetary support seems to be important in general; even though there are observable differences between industries. Public funding is particularly demanded by firms in the life science industry (73.3%), whereas this is less the case for the moving media (64.9%) and even less the food industry (53.6%). Innovation in the life science industry is often carried out in R&D laboratories with rather sophisticated and expensive technical equipment. Only companies with sufficient financial assets can afford their own equipment, whereas young and small firms need to rent facilities and machinery. The importance of public funds can also be explained by the risky nature and lengthy time horizon of innovation projects in life science, in which the transformation of scientific research into commercial products can take several

years (Cooke 2002, Gertler and Levitte 2005). Innovation in the food industry, in contrast, is less depended on high cost technical equipment and time intensive trials; it is instead driven by the know-how, craft and practical skills of people. Firms in the food industry need above all a workforce with good practical training, which is reflected by a high demand for policy initiatives addressing staff training (53.6%).

Very clear differences between industries can be observed when it comes to networking, e.g. policies facilitating the search for new partners. Whereas firms in the moving media (51.4%) and life science industry (56.7%) have a high demand for networking, only few firms in the food industry (17.9%) are interested in such support. In the media industry, innovation activities are often carried out in flexible and short term alliances involving various partners, thus access to a wide range of possible collaborators is important. Previous research has shown that collaboration in the moving media industry occurs predominantly with other firms in the same region, whereas collaboration with universities and actors outside the region plays a minor role (Martin and Moodysson 2011). Similar to moving media, actors in the life science industry are continuously seeking for partners for cooperation, but such alliances often occur within globally configured networks between firms and various research organisations (Gertler 2008). In contrast to this, the food industry is less engaged in the search for new partners; it is a rather mature industry with long history in the region. This implies that partnerships have developed and persist for a long time. However, the industry is increasingly exposed to international competition, thus firms need to reconfigure their established networks and improve their access to technological knowledge. This is in line with the observation that a large share of the firms claims for policy support to improve access to information about technologies (35.7%), whereas only few demand support for access to information about markets (14.3%). The opposite can be observed for the life science industry, in which a small share of the firms require help to find information about technologies (16.7%), which whereas a larger share demands access to market information (46.7%).

Perceived benefits from existing policy support programs

The previous section presented what kind of support is perceived as important by companies' representatives. This section will elaborate on what benefits companies achieved through respective policy support programs.

TABLE 2: BENEFITS ACHIEVED BY FIRMS IN DIFFERENT INDUSTRIES

	Life Science (n=30)	Food (n=28)	Moving Media (n=37)	Total (n=95)
Financing	6.6%	10.7%	5.4%	7.3%
Networking	36.6%	17.8%	54.0%	37.9%
Staff training	23.3%	14.2%	13.5%	16.8%
Information about market	46.6%	10.7%	48.6%	36.8%
Information about technology	23.3%	17.8%	18.9%	20.0%
Any type of policy support	80.0%	28.5%	69.4%	60.0%

Source: own survey

To begin with there are big differences between the food industry (28.5%) and the two other industries (69.4% and 80.0%) regarding the percentages of the companies that could identify any benefits at all from existing policy initiatives. As mentioned above, the food industry has a long history in the region. It has established routines and partnerships for its business activities. Food companies thus do not express any demand for external help to find partners (Table 1). Such a policy initiative as SFIN, primarily focusing on promoting networking between companies or between companies and the university, does not attract the firms to participate in its activities; the immediate benefits for the firms are not obvious. Due to low participation in the policy initiative, the results on the various types of benefits are not comparable with the results for the other two industries. The remainder of this section will thus primarily discuss the results for the life science and media industry.

Both the media and life science industry perceived that they benefited most by receiving support for getting access to market knowledge. Around half of the moving media (48.6%) and life science (46.6%) firms indicated this as a concrete benefit from respective policy support programs in the region. Since information about markets is one of these industries' most clearly identified demands (Table 1), it is likely that the firms consciously use these policy programs in order to improve their competitive advantage. It has to be said, however, that less moving media firms expressed a demand for market knowledge compared to life science. Despite the big demand for financing (Table 1), very

few firms in media (5.4%) and life science (6.6%) industries indicated that they acquired any financial support from existing policy initiatives. This is not surprising, since regional policy programs of the type analysed in this paper generally aim for indirect support targeting the system level, rather than direct support targeting individual firms. The contribution to financial capital mobilisation in the region is thus indirect, mostly through attracting investors and providing information about venture capitalists and various sources of R&D support, primarily administered at the national and international level (OECD 2009).

The firms in both industries got only moderate support regarding access to technology knowledge and staff training. However, some differences should be addressed. More life science firms (23.3%) indicated that they received help with human resource development than the media firms (13.5%). One potential explanation to this could be that staff training in symbolic industries is less related to formal education and codified knowledge, while tacit understanding of local culture and personal abilities to create artistic artefacts are crucial. Both these are hard to provide from aside; and even if achieved through interaction with other companies during social events and workshops, organized by policy support programs, they are not necessarily consciously perceived by companies' representatives. While in the case of codified knowledge exchange and formal education, the support is easier to notice and evaluate. This is also in line with the main focus of Swedish innovation policy, in which main attention is dedicated to support for R&D and higher education (Edquist 2002, Lundequist and Waxell 2010).

The findings about access to technological knowledge are interesting when relating it to companies' demands from the policy initiatives. As mentioned above, support for access to technological knowledge is perceived as moderate in both industries. 18.9% of the moving media firms and 23.3% of the life science firms indicated this as a concrete benefit. However, the life science industry does not demand it (Table1), possibly because technological knowledge defines the core competence of these firms, and therefore to a large part is managed internally. The media companies, on the contrary, display a high demand for technological knowledge. Symbolic industries do not produce new technologies; however, they use them in the creation of cultural artefacts. Technological

knowledge is thus needed for competitiveness of the firms, but it is not at the core of their competence. Therefore in order to access and acquire it they might need external support. Important to note, though, is that technological knowledge not by necessity equals scientifically based knowledge which indeed is strongly prioritized in Swedish and European innovation policy (Hansen and Winther 2010, Lundequist and Waxell 2010, Edquist 2002). The media companies are clearly more in need of experienced based practical knowledge such as craftsmanship that can help them materialize their ideas and communicate their symbolic knowledge, than scientific and engineering based knowledge as input for product or process innovations. Such support is more scarce, not to say non-existing, in Swedish and European innovation policy.

The results as regards how the firms perceive the benefits in terms of support for networking activities reveal observable differences between the industries. More than a half of the companies in both industries expressed a high demand for help to find partners (i.e. network promotion). However, the share of firms that benefited from support in networking activities is much larger in the moving media industry (54.0%) than in life science (36.6%). This result is most likely a consequence of the different modes of innovation characterizing the different industries. Firms in symbolic industries do mostly collaborate and exchange knowledge locally, while knowledge exchange in analytically based industries is embedded in globally configured professional knowledge communities (Gertler 2008, Moodysson 2008, Martin and Moodysson 2011).

Naturally, regional policy support programs have better capacity to promote local than global networking, and a vast majority of the network promoting activities initiated by the regional policy support programs are geared towards intra-regional networks. There is also a tendency among these activities to put main priority on university-industry networks, while the firm demands are more in favour of networking between firms in the same or related sectors. Furthermore, and somewhat paradoxically given the focus on industry-university networks, the support programs mostly promote networking through various forms of social events. In symbolic industries it might be appropriate to acquire ‘know-who’ information about each other and to discuss possible collaboration. In analytical industries, on the other hand, research is very specialized and social events are not sufficient to exchange knowledge about scientific and technological

'know-why'. There is thus a double mismatch connected to network promotion through regional policy support programs in Southern Sweden. In terms of geographical scope, there is a mismatch between needs/demands and received policy benefits primarily for life science and partly food industries, while in terms of scope there is a mismatch between needs/demands and received policy benefits for all three sectors.

Discussion and conclusions

To sum up the findings, there are both similarities and differences between the three industries. All of them demand financial support; however, this is the least met demand by regional policies. About half of the interviewed companies in all three industries demand labour training activities. However, similarly to financial support, a minority of the companies could identify any such benefits from existing policy support programs. Important to note in connection to this is that labour training do not necessarily equal formal education. Such training (i.e. higher education) might be of importance for the life sciences and to some extent the food industry, whereas the media industry requires different types of training such as on the job training, tutorials and guidance for various forms of experience-based learning.

Support with information about new technologies is primarily demanded by the moving media and food industries, while of little interest to actors in the life science industry. This demand is largely neglected by all the policy support programs and to the extent that it is promoted, scientifically based knowledge is strongly predominant. This is somewhat paradoxical since such knowledge is most relevant to the actors not demanding it (i.e. the life sciences) while the actors demanding it (food and media) hardly can absorb it, nor make let it feed into their current innovation and product development strategies which are largely based on non-scientific knowledge. Finally, industries differ a lot in the geography and organization of their networking activities. More than a half of both media and life science companies demand policies that help them to find partners, while only a few food companies do so. So far, policies targeting the moving media industry were more successful in promoting network activities than policies targeting the life science and food industries. This is partly due to the predominant focus on informal networks in the current regional policy programs, but also due to the

geographical intra-regional scope, which suits the media industry better than life science. The emphasis on industry-university relations, also characterizing the network promotion activities in all three policy support programs, is though less well suited for the media industry.

The aim of all three policy support programs was to be adopted and "internalized" by their target population, empowering the firms to conduct innovative actions in order to foster regional development. As suggested by theory, for a new initiative to be adopted, it must meet regulative as well as normative and cognitive requirements. All three policy support programs are in line with existing regulations, primarily set on an administrative level beyond the region. However, profound differences as regards needs and demands and perceived benefits among the actors representing the three industries reveal that normative patterns among the actors were hardly taken into account. Additionally, in the case of the food industry, there seem to be a mismatch between needs and demands. Network stimulation from aside is not demanded by companies, however, increased collaboration is indeed needed to break path dependency and stay competitive on an increasingly global market. It follows that in order to introduce new norms policy maker should first address the cognitive framework of the industry. Possibly through collaboration with pioneering industry representatives, widely distributed successful examples and other tools policy makers could contribute to changing the perception of 'right' behaviour.

The results from the survey carried out in this study are clearly in line with the theoretically derived assumptions following the knowledge base approach to innovation studies. Despite these differences, however, the policy support programs targeting these different types of industries appear as very similar in scope, providing more or less generic support in line with best practice models for innovation support which have had a strong impact on the predominant policies defining the Swedish and European research and innovation policy agendas the past decades. Typical activities defining those are regional industry-university network promotion, technology transfer support through incubation, human capital development through higher education, and regional branding in attempts at attracting venture capital and nationally and internationally governed funds for R&D.

These best practice models seem to be, with the exception of their predominant geographical scope, most well suited for industries drawing primarily on an analytical knowledge base. This is also reflected in the perceived benefits analysis presented in this study. A large share of firms representing the life science industry (drawing on analytical knowledge) could identify benefits from existing policy programs, while firms in the food industry (drawing on synthetic knowledge) clearly refuse to comply with attempts to change the institutional framework for their activities. However, even in life science regional policies fail to be fully institutionalized, as support related to financial capital, sufficiently developed global networking and possibilities for human resource development is limited. We argue that regional innovation policy ought to take this complexity and diversity into account and resist the temptation of implementing universal "one-size-fits-all" formulas (Tödtling and Trippl 2005). Such fine-tuned policies would though require completely new policy support instruments, not necessarily part of the policy makers' current portfolio. They would also require new ways of communication to enhance compliance and participation among the target population. Both the fine-tuning of activities and the more target-oriented ways of communicating these are necessary components in a strategy rendering such policy real influence on the institutional framework of the regional innovation system. Currently the abilities of analysed regional support programs to influence regional development seem to be limited.

References

Asheim, B., L. Coenen, J. Moodysson & J. Vang (2007a) Constructing knowledge-based regional advantage: Implications for regional innovation policy. *International Journal of Entrepreneurship and Innovation Management,* 7**,** 140-155.

Asheim, B. & H. K. Hansen (2009) Knowledge Bases, Talents, and Contexts: On the Usefulness of the Creative Class Approach in Sweden. *Economic Geography,* 85**,** 425-442.

Asheim, B. T. & L. Coenen (2005) Knowledge bases and regional innovation systems: Comparing Nordic clusters. *Research Policy,* 34**,** 1173-1190.

Asheim, B. T., L. Coenen & J. Vang (2007b) Face-to-face, buzz, and knowledge bases: sociospatial implications for learning, innovation, and innovation policy. *Environment and Planning C: Government and Policy,* 25**,** 655-670.

Asheim, B. T. & M. S. Gertler. 2005. The Geography of Innovation: Regional Innovation Systems. In *The Oxford Handbook of Innovation,* eds. J. Fagerberg, D. C. Mowery & R. R. Nelson, 291-317. Oxford: Oxford University Press.

Campbell, J. L. 2006. What's New? General Patterns of Planned Macro-institutional Change. In *Innovation, Science, and Institutional Change,* eds. J. Hage & M. Meeus, 505-524. Oxford New York: Oxford University Press.

Christensen, C. 2000. *The Innovator's Dilemma*. New York: Harper Business.

Cooke, P. (1996) The new wave of regional innovation networks: Analysis, characteristics and strategy. *Small Business Economics,* 8**,** 159-171.

Cooke, P. (2002) Biotechnology Clusters as Regional, Sectoral Innovation Systems. *International Regional Science Review,* 25**,** 8-37.

Cooke, P., C. De Laurentis, F. Tödtling & M. Trippl. 2007. *Regional Knowledge Economies: Markets, Clusters and Innovation*. Cheltenham: Edward Elgar.

Edquist, C. 2002. Innovationspolitik för Sverige. Mål, skäl, problem och åtgärder. In *VINNOVA Forum. Innovationspolitik i Fokus*. Stockholm: VINNOVA.

Egstrand, Å. K. & A.-M. Sätre (2008) Collaboration for local economic development: Business networks, politics and universities in two Swedish cities. *European Planning Studies,* 16**,** 487-505.

Etzkowitz, H. & L. Leydesdorff. 1997. *Universities and the global knowledge economy : a triple helix of university-industry-government relations*. London: Pinter.

Gertler, M. S. 2008. Buzz without being there? Communities of practice in context. In *Community, Economic Creativity and organization,* eds. A. Amin & J. Roberts. Oxford: Oxford University Press.

Gertler, M. S. & Y. M. Levitte (2005) Local Nodes in Global Networks: The Geography of Knowledge Flows in Biotechnology Innovation. *Industry & Innovation,* 12**,** 487-507.

Hall, P. 2010. Historical Institutionalism in Rationalist and Sociological Perspective. In *Explaining Institutional Change: Ambiguity, Agency, and Power,* eds. J. Mahoney & K. Thelen, 204-224. Cambridge: Cambridge University Press.

Hansen, T. & L. Winther. 2010. Innovation, regional development and relations between high- and low-tech industries. In *8th European Urban and Regional Studies Conference*. Vienna, Austria.

Henning, M., J. Moodysson & M. Nilsson. 2010. *Innovation and regional transformation: from clusters to new combinations*. Malmö: Region Skåne.

Hollingsworth, J. R. (2000) Doing institutional analysis: implications for the study of innovations. *Review of International Political Economy,* 7**,** 595-644.

Knight, J. 1992. *Institutions and Social Conflict*. Cambridge: Cambridge University Press.

Lambooy, J. G. & R. A. Boschma (2001) Evolutionary economics and regional policy. *The Annals of Regional Science,* 35**,** 113-131.

Lundequist, P. & A. Waxell (2010) Regionalizing "Mode 2"? The Adoption of Centres of Excellence in Swedish Research Policy. *Geografiska Annaler: Series B, Human Geography,* 92**,** 263-279.

Mahoney, J. & K. Thelen. 2010a. Explaining Institutional Change: Ambiguity, Agency, and Power. Cambridge: Cambridge University Press.

Mahoney, J. & K. Thelen. 2010b. A Theory of Gradual Institutional Change. In *Explaining Institutional Change: Ambiguity, Agency, and Power* eds. J. Mahoney & K. Thelen, 1-37. Cambridge: Cambridge University Press.

Martin, R. & J. Moodysson (2011) Innovation in Symbolic Industries: the Geography and Organisation of Knowledge Sourcing. *European Planning Studies*, forthcoming.

Moodysson, J. 2007. *Sites and modes of knowledge creation: on the spatial organization of biotechnology innovation*. Lund: Department of Social and Economic Geography, Lund University.

Moodysson, J. (2008) Principles and Practices of Knowledge Creation: On the Organization of "Buzz" and "Pipelines" in Life Science Communities. *Economic Geography*, 84**,** 449-469.

Moodysson, J., L. Coenen & B. T. Asheim (2008) Explaining spatial patterns of innovation: analytical and synthetic modes of knowledge creation in the Medicon Valley life-science cluster *Envirionment and Planning A,* 40**,** 1040-1056.

Nauwelaers, C. & R. Wintjes (2002) Innovating SMEs and regions: The need for policy intelligence and interactive policies. *Technology Analysis & Strategic Management*, 14**,** 201-215.

North, D. C. 1990. *Institutions, institutional change, and economic performance*. Cambridge: Cambridge University Press.

OECD. 2009. Interim Report on the OECD Innovation Strategy. An Agenda for Policy Action on Innovation. Paris: OECD.

Peck, J. 2000. Doing Regulation. In *The Oxford Handbook of Economic Geography*, eds. G. Clark, M. Gertler & M. Feldman, 61-80. New York: Oxford University Press.

Schwerin, J. & C. Werker (2003) Learning innovation policy based on historical experience. *Structural Change and Economic Dynamics,* 14**,** 385-404.

Scott, W. R. 1995. *Institutions and organizations*. Thousand Oaks, Calif.: Sage.

Sheingate, A. 2010. Rethinking Rules: Creativity and Constraint in the U.S. House of Representatives In *Explaining Institutional Change: Ambiguity, Agency, and Power,* eds. J. Mahoney & K. Thelen, 168-203. Cambridge: Cambridge University Press.

Tödtling, F. & M. Trippl (2005) One size fits all? Towards a differentiated regional innovation policy approach. *Research Policy,* 34**,** 1203–1219.

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