Paper no. 2013/13

System Failures, Knowledge Bases and Regional Innovation Policies

Roman Martin (roman.martin@circle.lu.se)
CIRCLE, Lund University

Michaela Trippl (michaela.trippl@circle.lu.se)
Department of Human Geography and CIRCLE, Lund University

This version: April 2013

Centre for Innovation, Research and Competence in the Learning Economy (CIRCLE)
Lund University
P.O. Box 117, Sölvegatan 16, S-221 00 Lund, SWEDEN
http://www.circle.lu.se/publications

WP 2013/13

System Failures, Knowledge Bases and Regional Innovation Policies

Roman Martin and Michaela Trippl

Abstract

Regional innovation strategies rank on the top of public policy agendas today. There is a widespread consensus in both academic and policy circles that standardised "best practice" innovation policy models suffer from severe limitations and major shortcomings. The recent literature is replete with claims that regional innovation policies should be place-based and context-sensitive, taking into consideration the specificities of regions and their distinctive preconditions and capacities for innovation. Various conceptual approaches and theories support such a view. This paper discusses two concepts, which have a particularly strong potential for informing a differentiated regional innovation policy approach; the regional innovation system (RIS) theory and the knowledge base concept. The RIS literature highlights the importance of the organisational and institutional setting of a region and suggests that system deficiencies or failures should constitute the starting point for designing regional innovation policies. The differentiated knowledge base approach stresses that regional industries differ strongly in the underlying knowledge bases and, as a consequence, in their policy needs. We elaborate on the policy implications that originate from these concepts and argue that tailor-made regional innovation policies should consider both region-specific institutional set-ups and knowledge bases.

JEL codes: L52, O21, O25, R11, R58

Keywords: regional innovation policy, regional innovation system, differentiated knowledge bases

System Failures, Knowledge Bases and Regional Innovation Policies

Roman Martin[1] and Michaela Trippl[2]

[1] CIRCLE (Centre for Innovation, Research and Competence in the Learning Economy), Lund University, Sweden. Email: roman.martin@circle.lu.se

[2] Department of Human Geography and CIRCLE (Centre for Innovation, Research and Competence in the Learning Economy), Lund University, Sweden. Email: michaela.trippl@keg.lu.se

Abstract

Regional innovation strategies rank on the top of public policy agendas today. There is a widespread consensus in both academic and policy circles that standardised "best practice" innovation policy models suffer from severe limitations and major shortcomings. The recent literature is replete with claims that regional innovation policies should be place-based and context-sensitive, taking into consideration the specificities of regions and their distinctive preconditions and capacities for innovation. Various conceptual approaches and theories support such a view. This paper discusses two concepts, which have a particularly strong potential for informing a differentiated regional innovation policy approach; the regional innovation system (RIS) theory and the knowledge base concept. The RIS literature highlights the importance of the organisational and institutional setting of a region and suggests that system deficiencies or failures should constitute the starting point for designing regional innovation policies. The differentiated knowledge base approach stresses that regional industries differ strongly in the underlying knowledge bases and, as a consequence, in their policy needs. We elaborate on the policy implications that originate from these concepts and argue that tailor-made regional innovation policies should consider both region-specific institutional set-ups and knowledge bases.

1 Introduction

Regional innovation strategies have become a key priority of policy actors in many countries and regions (OECD 2011). A growing body of work suggests that there is no standardized "one-size-fits all" innovation policy approach that could be applied to all types of regions. Indeed, there is a widespread agreement in the scientific community (Isaksen 2001, Nauwelaers and Wintjes 2003, Tödtling and Trippl 2005, Boschma 2009, Asheim et al. 2011a, Camagni and Capello 2012) and in policy circles (in particular in the form of smart specialisation strategies advocated by the EU (2011) and the OECD (2011)) that policies should be "fine-tuned" and place-based, taking into account the specificities of regions and their respective innovation potentials, assets and capabilities. What remains, however, less clear is how such a context-sensitive, differentiated regional innovation policy approach should look like. Scholarly contributions to this debate are based on a variety of theoretical frameworks including amongst others insights from evolutionary and institutional schools of thought, leading to partly very different conclusions about the nature of a fine-tuned regional innovation policy approach.

It is far beyond the scope of this paper to recapitulate the core arguments of all approaches and to discuss how they can add to the formulation of a differentiated regional innovation policy approach. The aim of this paper is to contribute to the debate about the nature of tailor-made regional innovation strategies by examining which policy implications can be drawn from two core concepts, that is, the regional innovation systems (RIS) theory and the notion of knowledge bases. Both concepts have essentially advanced one's understanding of the complexity of innovation processes, moving the discussion beyond the too simple views that have dominated innovation theory and policy discourses in the past. The RIS literature has shown that not only well-developed and institutionally thick core areas but all types of regions can be innovative, albeit in different forms. The knowledge base concept has sharpened our view that all industries – not only "high tech" ones – are engaged in innovation processes and it has provided the analytical tools for grasping inter-industrial variations of innovation patterns.

Both the RIS and the knowledge base notions are conceptually well equipped for transcending "one size fits all" formulas in innovation policy. The RIS concept puts due emphasis on the organisational and institutional setting of a region and emphasises that system failures (or deficiencies) should constitute the basis for legitimatising and designing regional innovation policies (Tödtling and Trippl 2005). The differentiated knowledge base approach highlights that industries differ strongly in the underlying knowledge bases (Asheim and Gertler 2005) and, as a consequence, in their policy needs (Martin et al. 2011). The two concepts offer complementary perspectives, which – when combined – provide a valuable framework for the design of fine-tuned regional innovation policies.

The remainder of this paper is structured as follows. Sections 2 and 3 discuss the RIS and knowledge base concepts in more detail, outlining their core arguments and setting out which perspectives they offer for the scope and objectives of fine-tuned regional innovation policies. Section 4 summarises the key insights and advances the idea that fine-tuned regional innovation policies should respond to the innovation challenges and opportunities associated with the institutional structures of a RIS and the specificities of the knowledge bases prevailing in the region.

2 Institutional configurations and failures of regional innovation systems as policy framework

The RIS concept (Cooke 1992, Asheim and Gertler 2005) figures prominently in contemporary discussions about the importance of regions as loci of knowledge creation and innovation processes. Research on RIS has grown enormously since the concept's first articulation and development in the in the early 1990s (for an insightful discussion of the theoretical antecedents and origins of the RIS approach, its development over the past two decades and recent advances see Asheim et al. 2011b).

A RIS is commonly understood as a set of several components (or elements) that are embedded in a common region-specific socio-institutional and cultural setting. RIS components include all private and public organisations that are involved in innovation processes, i.e., companies, public research institutes, technology transfer centres, educational and training bodies, workforce mediating organisations and finance providers. Then, regional policy actors are acknowledged to be an important component of RIS as they can play an essential role in shaping and facilitating innovation. This holds particularly true for political-administrative contexts, in which regions possess wide-ranging powers, i.e. sufficient legal competences and financial resources to design and implement their own innovation policies. Institutions – both "hard" ones such as laws and regulations and "soft" ones like norms, conventions and routines – are viewed as highly relevant as they influence the behaviour of innovation-relevant actors and the relations between them. Ideally, there are numerous connections between the elements of a RIS, facilitating a continuous flow of knowledge, human resources and skills at the regional level and giving rise to systemic innovation activities. Finally, it is also emphasised that RIS are not self-sustaining entities but they are usually linked to various national and international actors, organisations and innovation systems.

The general outline of the "architecture" of an ideal-type RIS suggested above does not hide the fact that such systems come in many shapes. Over the past years several typologies have been developed to capture the heterogeneity of regions and the variety of RIS that exist (for an overview see Tödtling and Trippl 2011). The RIS literature has not only shed light on differences between regions in terms of innovation potentials, organisational and institutional settings, network structures and innovation capabilities. One of the main strengths of the RIS concept is its strong policy agenda and capacity to articulate important ingredients and directions of regional innovation policies that are tailor-made to the respective specificities, challenges and needs of various types of regions (Asheim et al. 2013).

Tödtling and Trippl (2005) argue that such differentiated regional innovation policy approach should be built on system failures. They distinguish between three main types of RIS failures (or RIS deficiencies): organisational thinness, lock in, and fragmentation. Organizational thinness refers to situations in which crucial parts of an innovation system are weakly developed or even missing. Low levels of clustering or a weak endowment with key organisations and institutions are typical examples in this regard. Lock-in (or more precisely, negative lock-in) points to innovation problems that are related to an over-embeddedness and over-specialization in mature, declining industries and out-dated technologies. Finally, fragmentation is referred to as lacking interactions and knowledge flows between the organisations in an innovation system, resulting in low levels of systemic innovation activities.

Although regions can feature combinations of these RIS deficiencies, some system failures are more important than others in specific types of regions. Organizational thinness is often the predominant innovation problem in peripheral regions. These areas suffer from low levels of R&D and innovation, brought about by the dominance of SMEs operating in traditional industries, the absence of key assets for the development of new sectors, a low absorption capacity for knowledge from extra-regional sources, and a thin and less specialised structure of support organisations (Doloreux and Dionne 2008, Karlsen et al. 2011). Lock-in is usually a typical characteristic of many old industrial regions. These areas face the problem of an overspecialization in mature industries experiencing decline. Innovation activities in old industrialized areas frequently follow out-dated technological trajectories and the capacity of companies in these regions to engage in more radical innovation activities is rather weak. Functional, cognitive and political lock-ins supress innovation and keep the region in existing development paths (Grabher 1993, Trippl and Otto 2009, Hassink 2010). Finally, fragmentation can frequently be found in metropolitan areas (OECD 2010, Blazek and Zizalova 2010). This particular type of RIS deficiency often results from too much industrial diversity and a lack of related variety (Frenken et al. 2007, Asheim et al. 2011a), leading to low levels of intra-regional knowledge flows and innovation.

The heterogeneity of regions and the variety of RIS failures and deficiencies sketched out above clearly challenge the idea of an "ideal, best practice model" of innovation policy that can be applied in a similar way across all kind of areas. The RIS concept provides a framework for tailor-made policy interventions that address the specific innovation opportunities and problems prevailing in different types of regions. The basic principles and key characteristics of such a differentiated regional innovation policy approach are summarised in Table 1 and have been discussed in detail in previous work (Tödtling and Trippl 2005). In the context of this paper it is thus sufficient to briefly recapitulate the main strategic orientation and key elements of innovation policies for different types of regions.

As shown in Table 1, fine-tuned regional innovation policies for peripheral, old industrial and fragmented metropolitan regions should differ – amongst other aspects - regarding the promotion of intra-regional versus extra-regional networking, the orientation on endogenous versus exogenous firms and knowledge providers, and the strategic orientation on incremental versus radical innovation (see Tödtling and Trippl 2005). Innovation policies for peripheral areas should focus on upgrading the regional economy and promoting technological and organisational processes of "catching up" learning. Accessing extra-regional knowledge is viewed as highly important for this type of region (Rodriguez-Pose and Fitjar 2013). Such a strategy might encompass the attraction of innovative companies and research organisations from outside the region and linking domestic firms to external knowledge providers and innovation systems at higher spatial scales. Policy challenges in old industrial regions differ strongly from those in peripheral areas. Breaking path dependency and facilitating the restructuring of the regional economy are considered as pivotal for these areas. Facilitating industrial and technological diversification processes and fostering renewal and change of existing companies, network structures and institutions are viewed as sound elements in this regard (Trippl and Otto 2009). Fragmented metropolitan regions, in contrast, benefit from policy strategies and actions that aim at stimulating the dynamic development of science-based industries, "knowledge-intensive" services, and radical innovations. Of key importance are policy interventions that enhance interactive learning and knowledge circulation within the RIS to overcome the fragmented state of the system.

Table 1: Regional innovation policies for different types of regions and RIS failures

	Peripheral regions – organisational thinness	**Old industrial regions – lock in**	**Metropolitan regions - fragmentation**
Network initiatives	Promotion of linkages between companies and knowledge providers (within the region and – even more importantly – beyond)	Promotion of networking with respect to new sectors & technologies on regional, national and global scales	Promotion of regional inter-firm networks & university-industry linkages
Research and Education Infrastructure	Attraction of branches of national research organizations with relevance to regional firms & industries; establishment of technical colleges, engineering & management schools (provision of medium level skills)	Establishment of research organisations and universities in new & related fields Establishment of technical colleges & universities (provision of new skills)	Establishment of high quality universities and research organisations in relevant fields Establishment of universities & schools for highly specialised qualifications and skills
Firms and regional industries	Strengthening of potential clusters in the region Linking firms to clusters outside the region Attraction of innovative firms New firm formation	Support clusters in new/related industries & technologies Restructuring of old sectors Diversification New firm formation Attraction of cluster related FDI	Support of emerging clusters related to the region's knowledge base Develop specialisation advantages to achieve synergies and international visibility Attract cluster related FDI Support start-ups and spin-offs in knowledge based sectors
Overall / main innovation strategy	Strengthening/upgrading of regional economy Catching up learning (organisation, technology) Improve strategic and innovation capabilities of SMEs	Renewal of regional economy Innovation in new fields / trajectories Product & process innovation for new markets	Improve position of regional economy in global knowledge economy Science based and radical innovation, new ventures Enhance interaction between industry and knowledge providers

Source: Tödtling and Trippl (2005), own modification

To summarise, the RIS concept provides valuable insights into the sources of regional disparities in innovation, stressing that regions vary strongly with respect to their endowment with innovation-relevant organisations, institutional set-ups and networks. Moreover, the RIS concept offers a useful framework for "diagnosing" specific innovation problems and system failures that tend to prevail in different types of regions. Identification of RIS failures provides a legitimatisation of public policy action and a starting point for developing innovation policies that are tailored to the specific organisational and institutional set-up of regions. The RIS approach, however, does not sufficiently take into account that major differences exist between regional industries in terms of innovation patterns and challenges. In the next section, we will demonstrate that the knowledge base concept is a powerful approach for capturing such inter-sectorial variations. The notion of differentiated knowledge bases allows for a fine-grained analysis of the specificities of the industrial and economic structures of a RIS and their particular policy needs.

3 Differentiated knowledge bases as policy framework

Recent work on the geography of innovation stresses the need to draw more attention on industry specific differences that exist within RIS. One way of addressing sectorial variation in RIS is by reference to the knowledge dynamics that underlie innovation activities. The differentiated knowledge base approach argues that industries can be classified based on the type of knowledge that is critical for innovation (Laestadius 1998, Asheim and Gertler 2005). Three types of knowledge base can be distinguished; namely, analytical, synthetic and symbolic, which differ in various respects such as the rationale for knowledge creation, the development and use of new knowledge, the actors involved and the spatial configuration of innovation networks (Asheim et al. 2011a).

An analytical knowledge base is dominant in industries where innovation is primarily driven by scientific progress. Examples mentioned in the literature are biotechnology, life science and information and communication technology (ICT), which are often regarded as "high-tech" industries (Moodysson 2008, Asheim et al. 2011c). In these industries, new products and processes are developed in a relatively systematic manner involving basic and applied research. Firms usually invest heavily in intramural R&D, but rely also on knowledge generated at universities and other research organisations. Linkages between private firms and public research organisations are pivotal and take place more frequently than in other sectors. Since analytical industries deal with knowledge stemming from the academic sphere, they depend to a large extent on codified forms of knowledge contained in scientific publications and patents. These forms of knowledge are relatively easy to transfer and exchange over long distances. Therefore, knowledge sourcing takes place on a wide geographical scale, often within globally configured networks and epistemic communities (Plum and Hassink 2011a, Martin and Moodysson 2011b).

A synthetic knowledge base prevails in industries that innovate through the use and new combination of existing knowledge with the intention of solving concrete practical problems. Examples for synthetic industries are plant engineering, industrial machinery or food processing, sometimes also regarded as "traditional" industries (Trippl 2011a). In these industries, innovation is driven by applied research or incremental product and process development, whereas formal R&D is of minor importance. Linkages between university and industry are relevant, but occur more in applied research and education, and less in basic research. Tacit forms of knowledge are crucial, due to the fact that new knowledge often results from experience gained through learning by doing, using and interacting. Synthetic industries require know-how, craft and practical skills, which are often provided by professional and polytechnics schools or by on-the-job training. In comparison with analytical industries, knowledge networks are less globally configured, and knowledge sourcing takes place within national or regional boundaries, be it through cooperation between firms or mobility of employees. At the same time, many synthetic firms are involved in international user–producer relations, which provide knowledge linkages not to be neglected (Asheim and Coenen 2006, Broekel and Boschma 2011).

The symbolic knowledge base is a third category that receives increasing attention considering the growing importance of cultural production. It is present within a variety of industries such as advertisement, music, fashion, new media and design, sometimes also labelled "the cultural and creative industries" (Grabher 2002, Power and Scott 2004, Scott 2006). These industries have in common that innovation is devoted to the generation of aesthetic value and images and less to physical, tangible goods (Asheim et al. 2007).

Symbolic knowledge can be embedded in material goods such as clothing or furniture, but the impact on consumers and the economic value as such arise from its intangible character and aesthetic quality. Symbolic knowledge is highly context-specific as the interpretation of symbols, images, designs and cultural artefacts is tied to a deep understanding of the norms and conducts of specific social groupings. Therefore, the meaning and the value associated with it can vary considerably from one place to another. This also reflects the spatial dispersion of knowledge networks, which are, due to the context specificity of symbolic knowledge, predominantly locally configured connecting partners that share a similar socio-cultural background (Martin and Moodysson 2011a; Sotarauta et al. 2011).

In correspondence with previous findings on the geography and organisation of innovation outlined above, industries with different knowledge base are argued to differ also with regards to how regional innovation policy should be designed and implemented. Only recently, Martin et al. (2011) have shown that industries with different knowledge base vary strongly in their needs and requirements on innovation policy, while existing policy initiatives, at least in the case of southern Sweden, tend to neglect those differences in favour of rather generic policy measures. It is claimed here that policies should take into account the variety of knowledge bases in a regional innovation system and provide appropriate support that is attuned to the differentiated nature and geography of innovation (Hassink and Plum 2011b). Table 2 provides an overview on key elements of a regional innovation policy approach that is fine-tuned to the needs and characteristics of analytical, synthetic and symbolic industries.

Table 2: Regional innovation policies for analytical, synthetic and symbolic industries

	Analytical	**Synthetic**	**Symbolic**
Network initiatives	Promotion of university-industry partnerships Promotion of international networks	Promotion of inter-firm collaboration and user-producer partnerships Promotion of national and regional networks	Promotion of project-based collaboration between firms and with public and private customers Promotion of regional and local networks
Research and education Infrastructure	Higher education in fields of natural and formal sciences (e.g. chemistry, physics, mathematics) Support of top research milieus and global centres of excellence	Higher education in engineering based fields and applied sciences (e.g. mechanical and electrical engineering) Support of polytechnic schools and technical colleges with focus on applied science	Higher education in creative and arts based fields (e.g. architecture and design, visual arts, performing arts, humanities) Support of cultural and creative infrastructure (e.g. theatres, concert halls, exhibitions)
Innovation support for start-ups and SMEs	Science and technology parks Technology brokers and transfer agencies Public-private-partnerships for innovation Industrial PhDs	Innovation awards Innovation vouchers Life-long learning schemes Schemes for worker participation in innovation	Business support and coaching Provision of meeting places (e.g. conferences, fairs) Public procurement
Mobility and talent attraction schemes	Attraction of star scientists through promotion of business and people climate	Promotion of business climate (laws, regulations, tax incentives, etc.)	Promotion of people climate (diversity, tolerance, quality of place, etc.)

	Analytical	Synthetic	Symbolic
			Regional branding and place marketing
Anchoring projects	Big science projects and large scale research facilities	Attraction and retention of large anchor firms	Architectural landmarks and urban planning projects

Source: own compilation

Access to new knowledge is essential for innovation, irrespective of the knowledge base of an industry, whereas the geographical spread and the actors involved in knowledge networks differ between industries (Martin and Moodysson 2011b). Analytical industries are more prone to university-industry collaboration on a global scale, while inter-firm collaboration on the regional and local scale is more common to synthetic and symbolic industries. Research and education arrangements which are conductive to analytical knowledge bases include university education in natural and formal sciences, as well as research centres of excellence that provide access to global knowledge flows. Higher education for synthetic industries includes engineering training provided by universities and technical colleges with focus on applied science. Symbolic industries can be supported by creative and art-oriented education in combination with a well-developed cultural and creative regional setup. With regard to supporting start-ups and SMEs, typical science, technology and innovation (STI) oriented policy instruments such as science parks and technology transfer agencies are most suitable for analytical industries, while synthetic industries benefit from policy instruments designed to promote doing, using and interacting (DUI) modes of innovation, such as innovation awards and life-long learning schemes. Innovation support for symbolic industries includes the provision of physical and temporary meeting places such as conferences and exhibitions and should be attuned to the project-based organisation of innovation (Grabher 2002).

As regards mobility and talent attraction schemes, talented people with different knowledge base tend to have different locational preferences (Asheim and Hansen 2009). While a diverse and tolerant socio-economic environment, that is, a good "people climate", is particular important for knowledge workers in symbolic industries, synthetic industries benefit most from a well-developed "business climate". The attraction and retention of high-profile star-scientists who serve as critical knowledge brokers for analytical industries (Trippl and Maier 2011; Trippl 2011b) can be facilitated by both a good business and people climate (Asheim and Hansen 2009). Furthermore, investment in large anchoring projects attuned to the requirements of different industries may be favourable. Large scale research facilities can strengthen the analytical knowledge base of a region, whereas architectural landmarks and urban development projects can positively affect the symbolic knowledge base of RIS.

The policy approaches outlined above are fine-tuned to the requirements of different knowledge bases and can be applied to foster innovation in analytical, synthetic and symbolic industries. This does, however, not imply that regional innovation policies should solely promote one single knowledge base in order to secure long-term growth (Manniche 2012). Depending on the institutional preconditions of the respective RIS, fine-tuned regional innovation policies can take advantage of cross-fertilizing effects that occur at the intersection of knowledge bases. Grounded on the principles of related variety and differentiated knowledge bases, such "platform polices" should stimulate innovation and knowledge exchange both within and between sectors (Asheim et al. 2011a). In that way, they allow for dynamic combinations and shifts of knowledge bases along the evolution of RIS, and can contribute to breaking negative lock-in in regional development (Martin and Trippl 2013).

4 Conclusions

There is a growing recognition in academic and policy circles of a need for more fine-tuned regional innovation policies. The literature on the geography of innovation offers a rich conceptual basis for developing context-sensitive, tailor-made regional innovation strategies. This article has focused on two concepts, namely the RIS approach, which constitutes an essential theoretical underpinning of contemporary innovation policy strategies (OECD 2011), and the knowledge base approach, which is increasingly acknowledged for extending and further developing the RIS literature in essential ways.

The RIS approach emphasises the importance of a region's organisational and institutional set-up. According to the RIS theory, regional innovation policies should be designed to address system failures that characterise different institutional settings, such as organisational thinness, lock-in and fragmentation, and consider the specific innovation opportunities and problems prevailing in different types of regions. Policy strategies for peripheral regions, for instance, are recommended to stimulate knowledge upgrading and catching-up learning. Old industrial regions are best addressed by a policy approach that promotes sectorial and technological diversification, whereas metropolitan regions can benefit most from strengthening knowledge intensive industries and the regional STI infrastructure (Tödtling and Trippl 2005).

Adding to this line of argument, the differentiated knowledge base concept highlights the industrial variation that can exist within RIS. It advocates policy approaches that are customised to the nature of knowledge that is critical for innovation in different sectors. The knowledge base concept offers insights into how regional industries differ in their policy needs and demands as a consequence of their distinctive knowledge base characteristics. Besides, it stresses the importance of non-R&D based industries as drivers for regional innovation, which are often overlooked by policy makers (Robertson et al. 2009, Hansen and Winther 2011). Strengthening innovation through STI policy instruments is most conductive to analytical industries, whereas synthetic and in particular symbolic industries require a more "broad based" policy mix including the promotion of DUI and creativity based modes of innovation. A framework for how to design such policy approaches has been provided in this paper.

Depending on the institutional setup and the type of RIS under consideration, policy strategies can either create favourable conditions for one knowledge base, or stimulate cross-fertilisation effects which occur at the intersection of different knowledge bases. Organisationally thin RIS will benefit most from strengthening and expanding the supportive infrastructure attuned to one knowledge base, whereas locked-in regions can take advantage from diversification of knowledge bases, targeting at the renewal of existing regional development paths (Martin and Trippl 2013). Fragmented metropolitan regions typically possess a diversified industrial structure and can benefit from strengthening the connectivity between analytical, synthetic and symbolic activities within the RIS.

To sum up, it is argued in this paper that a nuanced understanding of institutional structures, system failures and industrial knowledge bases is necessary to design policy approaches that can account for the complexity and diversity of regional innovation systems. The notions of RIS and differentiated knowledge bases clearly complement each other. A framework that integrates both perspectives provides valuable implications for the development and implementation of smart, place-based regional innovation policies.

References

Asheim, B.T.; Coenen, L. (2005): Knowledge Bases and Regional Innovation Systems: Comparing Nordic Clusters. *Research Policy* 34 (8): 1173-1190.

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

Asheim, B.T.; Hansen, H.K. (2009): Knowledge Bases, Talents, and Contexts: On the Usefulness of the Creative Class Approach in Sweden. *Economic Geography* 85 (4): 425-442.

Asheim, B.T.; Coenen, L.; Vang, J. (2007): Face-to-Face, Buzz, and Knowledge Bases: Sociospatial Implications for Learning, Innovation, and Innovation Policy. *Environment and Planning C: Government and Policy* 25 (5): 655-670.

Asheim, B.T.; Boschma, R.; Cooke, P. (2011a): Constructing Regional Advantage: Platform Policies Based on Related Variety and Differentiated Knowledge Bases. *Regional Studies* 45 (7): 893-904.

Asheim, B.T.; Lawton Smith, H.; Oughton, C. (2011b): Regional Innovation Systems: Theory, Empirics and Policy. *Regional Studies* 45 (7): 875-891.

Asheim, B.T.; Moodysson, J.; Tödtling, F. (2011c): Constructing Regional Advantage: Towards State-of-the-Art Regional Innovation System Policies in Europe? *European Planning Studies* 19 (7): 1133-1139.

Asheim, B.T.; Bugge, M.; Coenen, L.; Herstad, S. (2013): What does Evolutionary Economic Geography Bring to the Table? Reconceptualising Regional Innovation Systems. CIRCLE Working Paper no. 2013/05, Circle, Lund University.

Blazek, J.; Zizalova, P. (2010): The Biotechnology Industry in the Prague Metropolitan Region: A Cluster Within a Fragmented Innovation System? *Environment and Planning C: Government and Policy* 28 (5): 887-904.

Boschma, R. (2009): Evolutionary Economic Geography and its Implications for Regional Innovation Policy, Paris: OECD

Broekel, T.; Boschma, R. (2011): Aviation, Space or Aerospace? Exploring the Knowledge Networks of Two Industries in the Netherlands. *European Planning Studies* 19 (7): 1205-1227.

Camagni, R.; Capello, R. (2012): Regional Innovation Patterns and the EU Regional Policy Reform: Towards Smart Innovation Policies. Paper presented at the 52nd ERSA conference, August 21-24, Bratislava, Slovakia.

Cooke, P. (1992): Regional Innovation Systems: Competitive Regulation in the New Europe. *Geoforum* 23(3): 365-382.

Doloreux, D.; Dionne, S. (2008): Is Regional Innovation System Development Possible in Peripheral Regions? Some Evidence from the Case La Pocatière, Canada. *Entrepreneurship and Regional Development* 20 (3): 259-283.

EU (2011): Regional Policy for Smart Growth in Europe. Brussels: EU Publications Office.

Frenken, K.; Van Oort, F.; Verburg, T. (2007): Related Variety, Unrelated Variety and Regional Economic Growth. *Regional Studies* 41 (5): 685-697.

Grabher, G. (1993): The Weakness of Strong Ties: The Lock-in of Regional Development in the Ruhr Area. In Grabher, G. (eds): *The Embedded Firm: On the Socioeconomics of Industrial Networks*, London: Routledge, 255-277.

Grabher, G. (2002): The Project Ecology of Advertising: Tasks, Talents and Teams. *Regional Studies* 36 (3): 245-262.

Hansen, T.; Winther, L. (2011): Innovation, Regional Development and Relations between High- and Low-Tech Industries. *European Urban and Regional Studies* 18 (3): 321-339.

Hassink, R. (2010): Locked in Decline? On the Role of Regional Lock-ins in Old Industrial Areas. In Boschma, R.; Martin, R. (eds.) *The Handbook of Evolutionary Economic Geography*, Edward Elgar, Cheltenham, 450-468.

Isaksen, A. (2001): Building Regional Innovation Systems: Is Endogenous Industrial Development Possible in the Global Economy? *Canadian Journal of Regional Science* 1, 101–120.

Karlsen, J.; Isaksen, A.; Spilling, O. (2011): The Challenge of Constructing Regional Advantages in Peripheral Areas: The Case of Marine Biotechnology in Tromsø, Norway. *Entrepreneurship and Regional Development* 23 (3-4): 235-257.

Laestadius, S. (1998): Technology Level, Knowledge Formation and Industrial Competence in Paper Manufacturing. In Eliasson, G.; Green, C. (eds): *The Micro Foundations of Economic Growth*. Ann Arbour: University of Michigan Press, 212-226.

Manniche, J. (2012): Combinatorial Knowledge Dynamics: On the Usefulness of the Differentiated Knowledge Bases Model. *European Planning Studies* 20 (11): 1823-1841.

Martin, R.; Moodysson, J. (2011a): Innovation in Symbolic Industries: The Geography and Organization of Knowledge Sourcing. *European Planning Studies* 19 (7): 1183-1203.

Martin, R.; Moodysson, J. (2011b): Comparing Knowledge Bases: On the Geography and Organization of Knowledge Sourcing in the Regional Innovation System of Scania, Sweden. *European Urban and Regional Studies* published online: Dec 22, 2011. doi: 10.1177/0969776411427326

Martin, R.; Moodysson, J.; Zukauskaite, E. (2011): Regional Innovation Policy Beyond "Best Practice": Lessons from Sweden. *Journal of the Knowledge Economy* 2 (4): 550-568.

Martin, R.; Trippl, M. (2013): Combining Knowledge Bases: The Emergence and Growth of New Media in Southern Sweden. Paper presented at the Regional Studies Association European Conference 2013, May 5-8, Tampere, Finland.

Moodysson, J. (2008): Principles and Practices of Knowledge Creation: On the Organization of "Buzz" and "Pipelines" in Life Science Communities. *Economic Geography* 84 (4): 449-469.

Nauwelaers, C.; Wintjes, R. (2003): Towards a New Paradigma for Innovation Policy? In: Asheim, B.; Isaksen, A.; Nauwelaers, C.; Tödtling, F. (eds.): *Regional Innovation Policy for Small–Medium Enterprises*. Cheltenham: Edward Elgar, 193–220.

OECD (2010): Higher Education in Regional and City Development: Berlin, Germany 2010. Paris: OECD.

OECD (2011): OECD Reviews of Regional Innovation - Regions and Innovation Policy. Paris: OECD.

Plum, O.; Hassink, R. (2011a): On the Nature and Geography of Innovation and Interactive Learning: A Case Study of the Biotechnology Industry in the Aachen Technology Region, Germany. *European Planning Studies* 19 (7): 1141-1163.

Plum, O.; Hassink, R. (2011b): Wissensbasen als Typisierung für eine maßgeschneiderte regionale Innovationspolitik von morgen? In Ibert, O.; Kujath, H.J. (eds.): *Räume der Wissensarbeit*. Wiesbaden: VS Verlag, 171-188.

Power, D.; Scott, A.J. (2004): Cultural Industries and the Production of Culture. London: Routledge.

Robertson, P.; Smith, K.; von Tunzelmann, N. (2009): Innovation in Low- and Medium-Technology Industries. *Research Policy* 38 (3): 441-446.

Rodriguez-Pose, A.; Fitjar, R. (2013): Buzz, Archipelago Economies and the Future of Intermediate and Peripheral Areas in a Spiky World. *European Planning Studies* 21 (3): 355-372.

Scott, A. (2006): Entrepreneurship, Innovation and Industrial Development: Geography and the Creative Field Revisited. *Small Business Economics* 26 (1): 1-24.

Sotarauta, M., Ramstedt-Sen, T., Seppänen, S.K.; Kosonen, K.-J. (2011): Local or Digital Buzz, Global or National Pipelines: Patterns of Knowledge Sourcing in Intelligent Machinery and Digital Content Services in Finland. *European Planning Studies* 19 (7): 1305-1330.

Tödtling, F.; Trippl, M. (2005): One Size Fits All? Towards a Differentiated Regional Innovation Policy Approach. *Research Policy* 34 (8): 1203-1219.

Tödtling, F.; Trippl, M. (2011): Regional innovation systems. In Cooke, P.; Asheim, B.; Boschma, R.; Martin, R.; Schwartz, D.; Tödtling, F. (eds.): *Handbook of regional innovation and growth*. Cheltenham: Edward Elgar, 455-466.

Trippl, M. (2011a): Regional Innovation Systems and Knowledge-Sourcing Activities in Traditional Industries-Evidence from the Vienna Food Sector. *Environment and Planning A* 43 (7): 1599-1616.

Trippl, M. (2011b): Scientific Mobility and Knowledge Transfer at the Interregional and Intraregional Level. *Regional Studies* published online: Mar 11, 2011, doi: 10.1080/00343404.2010.549119

Trippl, M.; Maier, G. (2011): Star Scientists as Drivers of the Development of Regions. In Nijkamp, P. and Siedschlag, I. (eds): *Innovation, Growth and Competitiveness*, Berlin and Heidelberg: Springer, 113-134.

Trippl, M.; Otto, A. (2009): How to Turn the Fate of Old Industrial Areas: a Comparison of Cluster-based Renewal Processes in Styria and the Saarland. *Environment and Planning A* 41 (5): 1217-1233.

CIRCLE ELECTRONIC WORKING PAPERS SERIES (EWP)

CIRCLE (Centre for Innovation, Research and Competence in the Learning Economy) is a multidisciplinary research centre set off by several faculties at Lund University and Blekinge Institute of Technology. CIRCLE has a mandate to conduct multidisciplinary research and education on the following issues: Long-term perspectives on innovation, structural change and economic growth, Entrepreneurship and venture capital formation with a special focus on new ventures, The dynamics of R&D systems and technological systems, including their impact on entrepreneurship and growth, Regional innovation systems in different national and international contexts and International comparative analyses of national innovation systems. Special emphasis is done on innovation policies and research policies. 10 nationalities and 14 disciplines are represented among the CIRCLE staff.

The CIRCLE Electronic Working Paper Series are intended to be an instrument for early dissemination of the research undertaken by CIRCLE researchers, associates and visiting scholars and stimulate discussion and critical comment.

The working papers present research results that in whole or in part are suitable for submission to a refereed journal or to the editor of a book or have already been submitted and/or accepted for publication.

CIRCLE EWPs are available on-line at: http://www.circle.lu.se/publications

Available papers:

2013

WP 2013/01
Start-up rates, Entrepreneurship Culture and the Business Cycle Swedish patterns from national and regional data
Martin Andersson

WP 2013/02
Market Thickness and the Early Labor Market Career of University Graduates -An urban advantage?
Lina Ahlin, Martin Andersson and Per Thulin

WP 2013/03
Implementing an R&D Strategy without Prior R&D-Experience - Recruitment as a Source of R&D-related Routines and Capabilities?
Lina Ahlin, Martin Andersson and Thorben Schubert

WP 2013/04
The Choice of Innovation Policy Instruments
Susana Borrás, Charles Edquist

WP 2013/05
What Does Evolutionary Economic Geography Bring To The Policy Table? Reconceptualising regional innovation systems
Bjørn Asheim, Markus M. Bugge, Lars Coenen, Sverre Herstad

WP 2013/06
Commercializing clean technology innovations – the emergence of new business in an agency-structure perspective
Sofia Avdeitchikova, Lars Coenen

WP 2013/07
Renewal of mature industry in an old industrial region: regional innovation policy and the co-evolution of institutions and technology
Lars Coenen, Jerker Moodysson and Hanna Martin

WP 2013/08
Systematic anchoring of global innovation processes and new industry formation – the emergence of on-site water recycling in China
Christian Binz, Bernhard Truffer and Lars Coenen

WP 2013/09
The internationalisation of R&D: sectoral and geographic patterns of cross-border investments
Cristina Castelli and Davide Castellani

WP 2013/10
Clean-tech innovation in Emerging Economies: Transnational dimensions in technological innovation system formation
Jorrit Gosens, Yonglong Lu and Lars Coenen

WP 2013/11
Why space matters in technological innovation systems – the global knowledge dynamics of membrane bioreactor technology
Christian Binz, Bernhard Truffer and Lars Coenen

WP 2013/12
MNC affiliation, knowledge bases and involvement in global innovation networks
Sverre J. Herstad, Bernd Ebersberger, Bjørn Asheim

WP 2013/13
System Failures, Knowledge Bases and Regional Innovation Policies
Roman Martin and Michaela Trippl

2012

WP 2012/01
Is the University Model an Organizational Necessity? Scale and Agglomeration Effects in Science
Tasso Brandt and Torben Schubert

WP 2012/02
Do regions make a difference? Exploring the role of different regional innovation systems in global innovation networks in the ICT industry
Cristina Chaminade and Monica Plechero

WP 2012/03
Measuring the knowledge base of regional innovation systems in Sweden
Roman Martin

WP 2012/04
Characteristics and Performance of New Firms and Spinoffs in Sweden
Martin Andersson and Steven Klepper

WP 2012/05
Demographic patterns and trends in patenting: Gender, age, and education of inventors
Olof Ejermo and Taehyun Jung

WP 2012/06
Competences as drivers and enablers of globalization of innovation: Swedish ICT industry and emerging economies
Cristina Chaminade and Claudia de Fuentes

WP 2012/07
The Dynamics and Evolution of Local Industries – The case of Linköping
Sabrina Fredin

WP2012/08
Towards a Richer Specification of the Exploration/Exploitation Trade-off: Hidden Knowledge-based Aspects and Empirical Results for a Set of Large R&D-Performing Firms
Torben Schubert and Peter Neuhaeusler

WP 2012/09
The European Spallation Source (ESS) and the geography of innovation
Josephine V. Rekers

WP 2012/10
How Local are Spatial Density Externalities? - evidence from square grid data
Martin Andersson, Johan Klaesson, Johan P Larsson

WP 2012/11
Why Pre-Commercial Procurement is not Innovation Procurement
Charles Edquist, Jon Mikel Zabala-Iturriagagoitia

2011

WP 2011/01
SMEs' absorptive capacities and large firms' knowledge spillovers: Micro evidence from Mexico
Claudia de Fuentes and Gabriela Dutrénit

WP 2011/02
Comparing knowledge bases: on the organisation and geography of knowledge flows in the regional innovation system of Scania, southern Sweden
Roman Martin and Jerker Moodysson

WP 2011/03
Organizational paths of commercializing patented inventions: The effects of transaction costs, firm capabilities, and collaborative ties
Taehyun Jung and John P. Walsh

WP 2011/04
Global Innovation Networks: towards a taxonomy
Helena Barnard and Cristina Chaminade

WP 2011/05
Swedish Business R&D and its Export Dependence
Karin Bergman and Olof Ejermo

WP 2011/06
Innovation Policy Design: Identification of Systemic Problems
Charles Edquist

WP 2011/07
Regional Institutional Environment and Its Impact on Intra-firm and Inter-organisational Innovation Networks: A Comparative Case Study in China and Switzerland
Ju LIU

WP 2011/08
Entrepreneurship: Exploring the Knowledge Base
Hans Landström, Gouya Harirchi and Fredrik Åström

WP 2011/09
Policy coordination in systems of innovation: A structural-functional analysis of regional industry support in Sweden
Magnus Nilsson and Jerker Moodysson

WP 2011/10
Urban Design in Neighbourhood Commodification
Ana Mafalda Madureira

WP 2011/11
Technological Dynamics and Social Capability: Comparing U.S. States and European Nations
Jan Fagerberg, Maryan Feldman and Martin Srhoelec

WP 2011/12
Linking scientific and practical knowledge in innovation systems
Arne Isaksen and Magnus Nilsson

WP 2011/13
Institutional conditions and innovation systems: on the impact of regional policy on firms in different sectors
Jerker Moodysson and Elena Zukauskaite

WP 2011/14
Considering adoption: Towards a consumption-oriented approach to innovation

Josephine V. Rekers

WP2011/15
Exploring the role of regional innovation systems and institutions in global innovation networks
Cristina Chaminade

2010

WP 2010/01
Innovation policies for development: towards a systemic experimentation based approach
Cristina Chaminade, Bengt-Ake Lundvall, Jan Vang-Lauridsen and KJ Joseph

WP 2010/02
From Basic Research to Innovation: Entrepreneurial Intermediaries for Research Commercialization at Swedish 'Strong Research Environments'
Fumi Kitagawa and Caroline Wigren

WP 2010/03 Different competences, different modes in the globalization of innovation?
A comparative study of the Pune and Beijing regions
Monica Plechero and Cristina Chaminade

WP 2010/04 Technological Capability Building in Informal Firms in the Agricultural Subsistence Sector In Tanzania: Assessing the Role of Gatsby Clubs
Astrid Szogs and Kelefa Mwantima

WP 2010/05
The Swedish Paradox – Unexploited Opportunities!
Charles Edquist

WP 2010/06
A three-stage model of the Academy-Industry linking process: the perspective of both agents
Claudia De Fuentes and Gabriela Dutrénit

WP 2010/07
Innovation in symbolic industries: the geography and organisation of knowledge sourcing
Roman Martin and Jerker Moodysson

WP 2010/08
Towards a spatial perspective on sustainability transitions
Lars Coenen, Paul Benneworth and Bernhard Truffer

WP 2010/09
The Swedish national innovation system and its relevance for the emergence of global innovation networks
Cristina Chaminade, Jon Mikel Zabala and Adele Treccani

WP 2010/10
Who leads Research Productivity Change? Guidelines for R&D policy makers
Fernando Jiménez-Sáez, Jon Mikel Zabala and José L- Zofío

WP 2010/11
Research councils facing new science and technology
Frank van der Most and Barend van der Meulen

WP 2010/12
Effect of geographical proximity and technological capabilities on the degree of novelty in emerging economies
Monica Plechero

WP 2010/13
Are knowledge-bases enough? A comparative study of the geography of knowledge sources in China (Great Beijing) and India (Pune)
Cristina Chaminade

WP 2010/14
Regional Innovation Policy beyond 'Best Practice': Lessons from Sweden
Roman Martin, Jerker Moodysson and Elena Zukauskaite

WP 2010/15
Innovation in cultural industries: The role of university links
Elena Zukauskaite

WP 2010/16
Use and non-use of research evaluation. A literature review
Frank van der Most

WP 2010/17
Upscaling emerging niche technologies in sustainable energy: an international comparison of policy approaches
Lars Coenen, Roald Suurs and Emma van Sandick

2009

WP 2009/01
Building systems of innovation in less developed countries: The role of intermediate organizations.
Szogs, Astrid; Cummings, Andrew and Chaminade, Cristina

WP 2009/02
The Widening and Deepening of Innovation Policy: What Conditions Provide for Effective Governance?
Borrás, Susana

WP 2009/03
Managerial learning and development in small firms: implications based on observations of managerial work
Gabrielsson, Jonas and Tell, Joakim

WP 2009/04
University professors and research commercialization: An empirical test of the "knowledge corridor" thesis
Gabrielsson, Jonas, Politis, Diamanto and Tell, Joakim

WP 2009/05
On the concept of global innovation networks
Chaminade, Cristina

WP 2009/06
Technological Waves and Economic Growth - Sweden in an International Perspective 1850-2005
Schön, Lennart

WP 2009/07
Public Procurement of Innovation Diffusion: Exploring the Role of Institutions and Institutional Coordination
Rolfstam, Max; Phillips, Wendy and Bakker, Elmer

WP 2009/08
Local niche experimentation in energy transitions: a theoretical and empirical exploration of proximity advantages and disadvantages
Lars Coenen, Rob Raven, Geert Verbong

WP 2009/9
Product Development Decisions: An empirical approach to Krishnan and Ulrich
Jon Mikel Zabala, Tina Hannemann

WP 2009/10
Dynamics of a Technological Innovator Network and its impact on technological performance
Ju Liu, Cristina Chaminade

WP 2009/11
The Role of Local Universities in Improving Traditional SMEs Innovative Performances: The Veneto Region Case
Monica Plechero

WP 2009/12
Comparing systems approaches to innovation and technological change for sustainable and competitive economies: an explorative study into conceptual commonalities, differences and complementarities
Coenen, Lars and Díaz López, Fernando J.

WP 2009/13
Public Procurement for Innovation (PPI) – a Pilot Study
Charles Edquist

WP 2009/14
Outputs of innovation systems: a European perspective
Charles Edquist and Jon Mikel Zabala

2008

WP 2008/01
R&D and financial systems: the determinants of R&D expenditures in the Swedish pharmaceutical industry
Malmberg, Claes

WP 2008/02
The Development of a New Swedish Innovation Policy. A Historical Institutional Approach
Persson, Bo

WP 2008/03
The Effects of R&D on Regional Invention and Innovation
Olof Ejermo and Urban Gråsjö

WP 2008/04
Clusters in Time and Space: Understanding the Growth and Transformation of Life Science in Scania
Moodysson, Jerker; Nilsson, Magnus; Svensson Henning, Martin

WP 2008/05
Building absorptive capacity in less developed countries
The case of Tanzania
Szogs, Astrid; Chaminade, Cristina and Azatyan, Ruzana

WP 2008/06
Design of Innovation Policy through Diagnostic Analysis:
Identification of Systemic Problems (or Failures)
Edquist, Charles

WP 2008/07
The Swedish Paradox arises in Fast-Growing Sectors
Ejermo, Olof; Kander, Astrid and Svensson Henning, Martin

WP 2008/08
Policy Reforms, New University-Industry Links and Implications for Regional Development in Japan
Kitagawa, Fumi

WP 2008/09
The Challenges of Globalisation: Strategic Choices for Innovation Policy
Borrás, Susana; Chaminade, Cristina and Edquist, Charles

WP 2008/10
Comparing national systems of innovation in Asia and Europe: theory and comparative framework
Edquist, Charles and Hommen, Leif

WP 2008/11
Putting Constructed Regional Advantage into Swedish Practice? The case of the VINNVÄXT initiative 'Food Innovation at Interfaces'
Coenen, Lars; Moodysson, Jerker

WP 2008/12
Energy transitions in Europe: 1600-2000
Kander, Astrid; Malanima, Paolo and Warde, Paul

WP 2008/13
RIS and Developing Countries: Linking firm technological capabilities to regional systems of innovation
Padilla, Ramon; Vang, Jan and Chaminade, Cristina

WP 2008/14
The paradox of high R&D input and low innovation output: Sweden
Bitarre, Pierre; Edquist, Charles; Hommen, Leif and Ricke, Annika

WP 2008/15
Two Sides of the Same Coin? Local and Global Knowledge Flows in Medicon Valley
Moodysson, Jerker; Coenen, Lars and Asheim, Bjørn

WP 2008/16
Electrification and energy productivity
Enflo, Kerstin; Kander, Astrid and Schön, Lennart

WP 2008/17
Concluding Chapter: Globalisation and Innovation Policy
Hommen, Leif and Edquist, Charles

WP 2008/18
Regional innovation systems and the global location of innovation activities: Lessons from China
Yun-Chung, Chen; Vang, Jan and Chaminade, Cristina

WP 2008/19
The Role of mediator organisations in the making of innovation systems in least developed countries. Evidence from Tanzania
Szogs, Astrid

WP 2008/20
Globalisation of Knowledge Production and Regional Innovation Policy:
Supporting Specialized Hubs in the Bangalore Software Industry
Chaminade, Cristina and Vang, Jan

WP 2008/21
Upgrading in Asian clusters: Rethinking the importance of interactive-learning
Chaminade, Cristina and Vang, Jan

2007

WP 2007/01

Path-following or Leapfrogging in Catching-up: the Case of Chinese Telecommunication Equipment Industry
Liu, Xielin

WP 2007/02
The effects of institutional change on innovation and productivity growth in the Swedish pharmaceutical industry
Malmberg, Claes

WP 2007/03
Global-local linkages, Spillovers and Cultural Clusters: Theoretical and Empirical insights from an exploratory study of Toronto's Film Cluster
Vang, Jan; Chaminade, Cristina

WP 2007/04
Learning from the Bangalore Experience: The Role of Universities in an Emerging Regional Innovation System
Vang, Jan; Chaminade, Cristina.; Coenen, Lars.

WP 2007/05
Industrial dynamics and innovative pressure on energy -Sweden with European and Global outlooks
Schön, Lennart; Kander, Astrid.

WP 2007/06
In defence of electricity as a general purpose technology
Kander, Astrid; Enflo, Kerstin; Schön, Lennart

WP 2007/07
Swedish business research productivity – improvements against international trends
Ejermo, Olof; Kander, Astrid

WP 2007/08
Regional innovation measured by patent data – does quality matter?
Ejermo, Olof

WP 2007/09
Innovation System Policies in Less Successful Developing countries: The case of Thailand
Intarakumnerd, Patarapong; Chaminade, Cristina

2006

WP 2006/01
The Swedish Paradox
Ejermo, Olof; Kander, Astrid

WP 2006/02
Building RIS in Developing Countries: Policy Lessons from Bangalore, India
Vang, Jan; Chaminade, Cristina

WP 2006/03
Innovation Policy for Asian SMEs: Exploring cluster differences
Chaminade, Cristina; Vang, Jan.

WP 2006/04
Rationales for public intervention from a system of innovation approach: the case of VINNOVA.
Chaminade, Cristina; Edquist, Charles

WP 2006/05
Technology and Trade: an analysis of technology specialization and export flows
Andersson, Martin; Ejermo, Olof

WP 2006/06
A Knowledge-based Categorization of Research-based Spin-off Creation
Gabrielsson, Jonas; Landström, Hans; Brunsnes, E. Thomas

WP 2006/07
Board control and corporate innovation: an empirical study of small technology-based firms
Gabrielsson, Jonas; Politis, Diamanto

WP 2006/08
On and Off the Beaten Path:
Transferring Knowledge through Formal and Informal Networks
Rick Aalbers; Otto Koppius; Wilfred Dolfsma

WP 2006/09
Trends in R&D, innovation and productivity in Sweden 1985-2002
Ejermo, Olof; Kander, Astrid

WP 2006/10
Development Blocks and the Second Industrial Revolution, Sweden 1900-1974
Enflo, Kerstin; Kander, Astrid; Schön, Lennart

WP 2006/11
The uneven and selective nature of cluster knowledge networks: evidence from the wine industry
Giuliani, Elisa

WP 2006/12
Informal investors and value added: The contribution of investors' experientially acquired resources in the entrepreneurial process
Politis, Diamanto; Gabrielsson, Jonas

WP 2006/13
Informal investors and value added: What do we know and where do we go?
Politis, Diamanto; Gabrielsson, Jonas

WP 2006/14
Inventive and innovative activity over time and geographical space: the case of Sweden
Ejermo, Olof

2005

WP 2005/1
Constructing Regional Advantage at the Northern Edge
Coenen, Lars; Asheim, Bjørn

WP 2005/02
From Theory to Practice: The Use of the Systems of Innovation Approach for Innovation Policy
Chaminade, Cristina; Edquist, Charles

WP 2005/03
The Role of Regional Innovation Systems in a Globalising Economy: Comparing Knowledge Bases and Institutional Frameworks in Nordic Clusters
Asheim, Bjørn; Coenen, Lars

WP 2005/04
How does Accessibility to Knowledge Sources Affect the Innovativeness of Corporations? Evidence from Sweden
Andersson, Martin; Ejermo, Olof

WP 2005/05
Contextualizing Regional Innovation Systems in a Globalizing Learning Economy: On Knowledge Bases and Institutional Frameworks
Asheim, Bjørn; Coenen, Lars

WP 2005/06
Innovation Policies for Asian SMEs: An Innovation Systems Perspective
Chaminade, Cristina; Vang, Jan

WP 2005/07
Re-norming the Science-Society Relation
Jacob, Merle

WP 2005/08
Corporate innovation and competitive environment
Huse, Morten; Neubaum, Donald O.; Gabrielsson, Jonas

WP 2005/09
Knowledge and accountability: Outside directors' contribution in the corporate value chain
Huse, Morten, Gabrielsson, Jonas; Minichilli, Alessandro

WP 2005/10
Rethinking the Spatial Organization of Creative Industries
Vang, Jan

WP 2005/11
Interregional Inventor Networks as Studied by Patent Co-inventorships
Ejermo, Olof; Karlsson, Charlie

WP 2005/12
Knowledge Bases and Spatial Patterns of Collaboration: Comparing the Pharma and Agro-Food Bioregions Scania and Saskatoon
Coenen, Lars; Moodysson, Jerker; Ryan, Camille; Asheim, Bjørn; Phillips, Peter

WP 2005/13
Regional Innovation System Policy: a Knowledge-based Approach
Asheim, Bjørn; Coenen, Lars; Moodysson, Jerker; Vang, Jan

WP 2005/14
Face-to-Face, Buzz and Knowledge Bases: Socio-spatial implications for learning and innovation policy
Asheim, Bjørn; Coenen, Lars, Vang, Jan

WP 2005/15
The Creative Class and Regional Growth: Towards a Knowledge Based Approach
Kalsø Hansen, Høgni; Vang, Jan; Bjørn T. Asheim

WP 2005/16

Emergence and Growth of Mjärdevi Science Park in Linköping, Sweden
Hommen, Leif; Doloreux, David; Larsson, Emma

WP 2005/17
Trademark Statistics as Innovation Indicators? – A Micro Study
Malmberg, Claes