



# Knowledge bases and regional innovation systems: Comparing Nordic clusters

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Received 3 October 2004; received in revised form 26 January 2005; accepted 7 March 2005

Available online 27 June 2005

## Abstract

The analysis of the importance of different types of regional innovation systems must take place within a context of the actual knowledge base of various industries in the economy, as the innovation processes of firms are strongly shaped by their specific knowledge base. In this paper, we shall distinguish between two types of knowledge base: analytical and synthetic. These types indicate different mixes of tacit and codified knowledge, codification possibilities and limits, qualifications and skills, required organisations and institutions involved, as well as specific competitive challenges from a globalising economy, which have different implications for different sectors of industry, and, thus, for the kind of innovation support needed. The traditional constellation of industrial clusters surrounded by innovation supporting organisations, constituting a regional innovation system, is nearly always to be found in contexts of industries with a synthetic knowledge base (e.g. engineering-based industries), while the existence of regional innovation systems as an integral part of a cluster will normally be the case of industries-based on an analytical knowledge base (e.g. science-based industries, such as IT and bio-tech). In the discussion of different types of regional innovation systems five empirical illustrations from a Nordic comparative project on SMEs and regional innovation systems will be used: the furniture industry in Salling, Denmark; the wireless communication industry in North Jutland, Denmark; the functional food industry in Scania, Sweden; the food industry in Rogaland, Norway and the electronics industry in Horten, Norway. We argue that in terms of innovation policy the regional level often provides a grounded approach embedded in networks of actors acknowledging the importance of the knowledge base of an industry.

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*Keywords:* Regional innovation systems; Knowledge bases; Nordic countries

## 1. Introduction

Over the past two decades social scientist and policy makers have been paying more and more attention to regions as designated sites of innovation and

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competitiveness in the globalising economy. The popularity of this argument can be traced back to various empirical studies of regional success stories, such as the rapid economic growth of networked SMEs in industrial districts in the ‘Third Italy’ (Asheim, 2000), the exemplar industrial system of Silicon Valley (Saxenian, 1994) as well as other examples of successful regional clustering in most developed as well as developing economies (Porter, 1990). These studies all draw on the common rationale that territorial agglomeration provides the best context for an innovation-based globalising economy because of localised learning processes and ‘sticky’ knowledge grounded in social interaction (Asheim, 2002; Asheim and Isaksen, 2002; Gertler, 2004). They have emphasised the significance of the regional level in economic development in addition to—and sometimes over—the national level.

Two concepts belonging to the territorial innovation theory family (Moulaert and Sekia, 2003) have demonstrated particular resonance in academic and policy circles: regional innovation systems (RIS) and clusters (Cooke et al., 2004; Porter, 2000). Even though both concepts are closely related, they should not be conflated. Isaksen and Hauge (2002, p. 14) define the latter as “a concentration of ‘inter-dependent’ firms within the same or adjacent industrial sectors in a small geographic area”. A RIS, on the other hand, is defined as “interacting knowledge generation and exploitation subsystems linked to global, national and other regional systems” (Cooke, 2004, p. 3). In principle it stretches across several sectors in the regional economy, given that firms and knowledge organisations interact systematically (i.e. consistently). From this follows that clusters and RIS can (and often do) co-exist in the same territory. In a policy context it is nonetheless crucial to acknowledge the sector specificity of clusters and the more generic sector orientation of RIS.

This paper takes up the issue of regionalising innovation policy by looking from a bottom-up perspective at the linkage between regional innovation systems and clusters. Arguing strongly against any universally valid, ‘one-size-fits-all’ model, we contend that in line with its sector specificity a differentiation needs to be made on the basis of the cluster’s knowledge base. For clusters with a synthetic (engineering-based) knowledge base, the logic behind the regional innovation system (as well as regional innovation policy) is to support and strengthen localised learning of an exist-

ing industrial specialisation, i.e. to promote historical technological trajectories-based on sticky knowledge. We call this the ex-post approach. In the case of an analytical (science-based) knowledge-based cluster, it is a question of promoting new economic activity, requiring close and systemic industry–university co-operation and interaction in the context of, e.g. science parks and incubator centres. We call this the ex-ante approach. Based on this distinction we compare five Nordic clusters across a range of differing industries and draw conclusions for the regionalisation of innovation policy.

Section 2 introduces the notion of the learning economy as well as the main differentiation track: industrial knowledge bases. Section 3 introduces the concept of regional innovation system. Section 4 presents an overview of the varieties of regional innovation systems, while Section 5 provides the empirical illustrations from a Nordic comparative project on SMEs and regional innovation systems. Finally, conclusions and policy implications are given in Section 6.

## 2. Providing context: the learning economy and industrial knowledge bases

Both the knowledge-based as well as learning economy rationale argue that in the globalising economy knowledge is the most strategic resource and learning the most fundamental activity for competitiveness (Lundvall, 1992; OECD, 1996). However, in academic as well as policy oriented discourses these two concepts have from time to time taken on different meanings with potential importance for the theoretical understanding of the contemporary economy as well as for policy implications. Lundvall has always preferred to talk about the contemporary global economy as a ‘learning economy’, while the OECD (at least the economic sections), being influenced by the US, has instead more often used ‘the knowledge-based’ economy. This difference can basically be traced back to the taxonomic differentiation between high-, medium- and low-tech industries as suggested and endorsed by the OECD (1986). Though the initial discussion was carefully launched, offering many necessary qualifications, it seems that the high-tech fascination has taken on a life of its own, limiting knowledge-intensive and innovative activities exclusively to high-tech industries, such as

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