

## What is the role of regions in innovation policy?

### Innovation trends and the regional dimension of innovation

The following three major trends are reshaping innovation and create a role for regions (OECD, 2011, section 1.2):

- Globalization increases the need for local action to identify possible endogenous sources of growth, retain and attract talent and investments, and challenge regions to upgrade their capacity to link with global innovation networks.
- Societal and environmental challenges call on regions to create incentives and solutions to boost supply (new technologies, new energies, new patterns of production and trade) and demand (new patterns of consumption and use) to address these challenges.
- The increased importance of networked innovation creates opportunities for regions that can play a facilitator and broker role to ensure fluidity of relationships and support collaboration of actors within and outside the region, encouraging both “regional buzz” and access to “global pipelines” (Bathelt, Malmberg and Maskell, 2004).

### Regional innovation systems

The concept of “innovation system,” emphasizing the evolutionary and interactive dimensions of innovation and the importance of hard and soft institutions, was initially developed with a focus on the national level. It has been subsequently applied to the regional level on the basis of the following rationales (Tödtling and Trippl, 2011):

- The observed variety in regional economic specialization patterns and innovation performance;
- The spatially-bounded character of (some) knowledge spillovers;
- The importance of tacit knowledge, which cannot be transferred easily across space because it relies on trust-based relationships favoured by geographical proximity; and
- The fact that some institutional competences and policy resources relevant for innovation are devolved to sub-national authorities.

In a regional innovation system firms and other organisations are systematically engaged in interactive learning within an institutional environment characterised by embeddedness, that is, interactions and networks rooted in a specific local economic, institutional, social and cultural contexts. One view of the regional innovation system sees it as a combination of two subsystems: the knowledge application and exploitation sub-system centred on firms, and the knowledge generation and diffusion sub-system centred on public research, education and technology diffusion organizations. In this view policy acts on the endowments and relationships within and between these sub-systems (Tödtling and Trippl, 2011). Other views of the regional innovation system refer to the “regional innovation ecosystem” where the role of users and markets for innovation is prominent, and where the distinction between the two subsystems is blurred as innovation is “co-created” by actors in all parts of the system.

Therefore, the region is increasingly seen as the level at which innovation occurs most effectively through networks of innovators, local clusters and the cross-fertilising effects of research institutions. These theoretical and empirical concepts have shifted the policy focus towards local and regional policy interventions in favour of innovation.

### **Heterogeneity of regional innovation systems**

The growth pattern of regions across the OECD is uneven, reflecting their diversity in income levels, employment rates, mixes of high and low productivity activities, assets, comparative advantages, stages of development and public policies. OECD-wide analysis of the determinants of regional growth has put in evidence that, although national factors influence regional growth, regional factors in most cases largely determine regions' performance (OECD, 2009). This points towards the potential for exploiting regions' specific assets and addressing their specific failures to nurture growth.

To picture the high degrees of heterogeneity between regional innovation systems, reflecting different regional development paths, the OECD and the European Commission (EC) have developed typologies of innovative regions, relying on the following quantitative indicators:

- The OECD has developed a categorization of regions based on an analysis of the regional economic performance, labour market and technology-based innovation indicators, resulting in eight region types falling into three broad categories: knowledge hubs, industrial production zones and non-science and technology (S&T)-driven regions (OECD, 2011 section 1.3 and Annex 1).
- *The European Regional Innovation Scoreboard* provides a comparative assessment of regional innovation performance. The report covers 190 regions across the European Union, Norway and Switzerland and classifies them into four innovation performance groups, "innovation leaders", "innovation followers", "moderate innovators" and "modest innovators" (EC, 2013).

Beyond those efforts that use primarily R&D and technology indicators, the role of non-technological innovation, which is less well measured, is also acknowledged by many regions. Innovation in more traditional sectors and in creative industries is relevant for many regions that rely on innovation models that are not science-driven. Recent efforts try to use indicators capturing the creative climate and the quality of structural conditions for creativity and design, and develop scoreboards with a more open definition of innovation, but such comparative data are lacking at the regional level (Hollanders and Van der Cruysen, 2009).

Other typologies of regional innovation systems rely on more qualitative assessments linked to institutional features or to the knowledge base of industries, and include the following:

- "Institutional regional innovation systems", relying on state and institutional support, are systems that are well-suited to the development of more traditional sectors, while "entrepreneurial regional innovation systems", relying on venture capital, entrepreneurship, scientific excellence and market demands are those where high-technology industries flourish (Cooke, 2004).
- The roles of key actors, institutions and policies differ markedly between "grass-root", "networked" and "dirigiste" regional innovation systems (Cooke, 2008).
- Regions characterised by industries relying on diverse knowledge bases—"analytical" (e.g.

biotech), “synthetic (e.g. engineering), “symbolic” (e.g. cultural industries—have different assets and potential for development (Asheim and Gertler, 2005).

- Fragmented, locked-in or peripheral types of regional innovation systems also display very different environments for innovation (Tödtling and Trippl, 2005).
- Diversity in regional innovation systems and development trajectories calls for a tailor-made policy for innovation in regions rather than a “one-size-fits-all” policy (Tödtling and Trippl, 2005).

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