Regional dimension of innovation

TDPC's contribution to the OECD Innovation Strategy

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This document is submitted to delegates at the TDPC's 18th Session for DISCUSSION. It explains why the regional dimension is central to an effective innovation policy. Delegates will be invited to discuss what could be TDPC's contribution to the OECD Innovation Strategy.

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THE REGIONAL DIMENSION OF INNOVATION

1. Introduction

1. The adaptation of production to new knowledge and ideas is a crucial factor for maintaining and improving competitiveness and generating wealth. At the OECD ministerial meeting in May 2007, ministers underlined that innovation performance is a crucial determinant of competitiveness, productivity and national progress, and that it is an important key to addressing global challenges such as climate change and sustainable development. Emphasising the crosscutting nature of innovation, they endorsed a mandate for the OECD to develop a comprehensive Innovation Strategy.

2. In the context of strategies to promote growth through innovation, governments are increasingly realising that the regional dimension of innovation is crucial. This realisation is now shared among ministries of economy and finance, science, technology and industry, and regional development.

3. TDPC work on regional innovation is designed to help policy makers from different policy backgrounds and at both national and regional levels to improve the evidence base for targeting policy, make better use of resources in different regional contexts, ensure coherence between innovation and other policy objectives and evaluate the impact of their policies at regional and national level.

2. A focus on regional innovation is a crucial element of a comprehensive innovation strategy

4. The fact that some regions appear to be more innovative than others seems to run counter to assertions that globalisation reduces the importance of distance in business, making it possible for firms to access the inputs and knowledge that they need from anywhere across the globe. Over the last few years, many of the leading firms in "new economy" industries – those driven by rapid innovation in products, processes and commercialisation -- have emerged in the same few locations across the world. This seems to suggest some qualification of the hypothesis that many of the drivers of economic change (particularly globalisation and technological advances) are "flattening" the world economy.

5. Comparing similar sectors, for example, there is significant variation in innovative performance between firms from different regions. And data on innovation indicators suggest very marked differences in the outcomes achieved by different regions, even where other socio-economic variables are similar. Why, for example, do regions such as Stockholm and Eindhoven generate 250 ICT patents per million inhabitants annually, while many other large urban region generate less than half that number (and around one-third of EU regions generate less than 1 patent per million inhabitants). Why is three-quarters of the US biotechnology industry located in just five urban centres (even though 41 out of 50 US states have established significant funding programmes to spur development of the life sciences industry)?

6. Can we say that these innovative regions out-perform other regions? The correlation between patent applications and labour productivity within regions during 1998-2003 is positive in 19 out of 22 OECD countries, and strongly positive in several. And analysis of the main region-level innovation indicators for EU countries suggests that around 35% of variation in regional GDP per capita can be

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3 OECD (2007), Regions at a Glance.
explained by innovation performance (although the direction of causality is difficult to determine). So, while there are numerous other factors that explain the success of specific regions, innovation performance is prominent among them.

7. This leads to two policy considerations that are relevant for policy makers from both the regional development and innovation policy domains:

1. Strong dynamics of innovation-generation in regions are crucial for achieving national innovation policy objectives, and

2. Innovation performance can contribute to improving the overall economic competitiveness of individual regions

8. There is an important dilemma that flows from these two conclusions. If innovation is an important driver of growth at regional level, should public policy focus on regions where the dynamic is clearly present or look to use innovation policy to trigger growth. In other words, should innovation resources be concentrated in places where innovation capacity is currently highest or should they be used to catalyse increased capacity in other regions? The regional balance-competitiveness debate in regional development finds echoes in the innovation policy debate as well (the evolution of the French *poles de compétitivité* and recent debates on implementation of the Lisbon agenda in EU countries are evidence of this).

9. The real choice is not simply between concentration and dispersion of investment: in reality, regions have very diverse needs in terms of innovation support (because of different enterprise structures and knowledge infrastructure assets). A key challenge is to understand the relevance of different types of investment and types of policy instrument for individual regions and to identify which instruments are best suited to which contexts. Concerns expressed by central government policymakers that regional innovation strategies tend to resemble one another or focus on unrealistic ambitions illustrate the challenge. Innovation policy needs to be more place- and context-specific, often less dependent on traditional notions of S&T driven innovation. But defining a more flexible approach to investing in innovation is far from straightforward, particularly against a background of globalisation and rapid reorganisation of production systems.

**Remaining research questions and policy issues for TDPC**

- **What factors determine the innovation performance of regions?** The links between regional growth and innovation are not clearly understood. How are innovation inputs translated to outputs in a given region and what are the links to growth (and other economic objectives, such as employment creation)?

- **Investment in innovation – measuring inputs and outputs.** How can policymakers assess whether the innovation performance of a region or regions is satisfactory given assets and environmental factors? How can innovation "dynamics" be identified and benchmarked?

- **Concentration or dispersion?** Should innovation resources be concentrated in places where innovation capacity is currently highest or should they be used to catalyse increased capacity in other regions?

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4 See research by EU Regional Innovation Scoreboard/MERIT
• **One approach for all regions?** How can nationally designed policies to promote innovation take into account the needs of different types of regions (rural, industrial, metropolitan, etc.) with different economic structures (innovation in service activities, in traditional industries, etc.) and different innovation resources?

• **How can policymakers better evaluate innovation capacity?** Governments report that regional strategies are often based on a weak evidence base. What resources (statistical, methodological) are needed to help understand how regions are positioned domestically and internationally? How can this diagnosis lead to better strategy and policy?

3. **Regions are at the centre of global innovation systems**

10. A key reason for firms to want to locate close to one another is that being in such an environment helps them innovate and keep up with other innovators. Despite the global scale of many large firms, new business models increase the reliance of firms on face-to-face collaboration, particularly in the field of innovation.

11. The ability of and incentives for firms to innovate are linked to a wide range of factors that are national in scope, such as legislative and macroeconomic settings (IPR and patent law, taxation, corporate governance, exchange rates, tariffs, competition...). But innovation is strongly influenced by region-specific factors. These endowments are both physical and human, individual and collective, and found in both public and private spheres. First, innovation depends on the **scientific capacity** of actors and institutions (their acquired knowledge of existing knowledge and concepts, their openness to new knowledge and ability to assimilate, etc.). But the **technological capacity** of actors (their capacity to perceive usefulness and applicability of knowledge) is also important. And, finally, **industrial capacity** plays a role (the capacity of actors to transform concepts and ideas into useful, commercially viable products).

12. Technology and innovation are not created in isolated organisations but in favourable environments, where competent organisations and skilled individuals interact in a constructive and complementary way. The ultimate success of these individual and collective processes depends on communication of ideas and on collaboration in collective or institutional settings. In other words, innovation depends on effective organisation of scientific activity, of technological activity and of industrial activity. The focus of policy makers on the concept of national innovation systems is an example of how the issue of spillovers and interlinkages is now central to understanding of how innovation is generated.

13. In this context, the importance of the region becomes clear. The emphasis on effective institutional management of the resources that generate innovation focuses attention on **where these interactions take place** – the *spatial* origin of information and technology used by firms to increase their productivity. Does innovation derive from spillovers and diffusion processes that are national in scope, international or even virtual? Or does it arise from processes that are localised in regions or cities? There is strong evidence that the latter is often decisive (though obviously all spatial dimensions contribute).

14. Firms derive added value from their regional environment. The question is how (and if the processes that generate innovation in firms can be strengthened or, where they are inadequate, “created” or replicated).

15. For example, large firms are under pressure to innovate their products and develop and assimilate new technologies rapidly, which put extra emphasis on having effective innovation processes. Firms in research intensive fields like ICT or biopharmaceuticals cannot do this effectively through their traditional
internal innovation structures and have seen the productivity of in-house R&D decline. More open innovation systems, in which innovation occurs outside the normal boundaries of individual firms, often across sectoral boundaries, are becoming an important tool by which both large and small firms can share the risk of generating new products. And these models are strongly facilitated by direct interaction among actors.

16. Many small firms, on the other hand, deliver intermediate goods or services to other firms. In a supply chain environment, large firms often operated as ‘gatekeepers’ towards the market. Investment decisions by SMEs -- including innovation expenditures and technology adoption decisions – were usually taken in consultation with the major customers. As production systems become broader and less hierarchical, SMEs need to enter into more complex, broader relationships with both existing and new customers, as well as potential collaborators, to determine their innovation strategies. Again, this process tends to strengthen rather than diminish the importance of the region in generating innovation.

17. Finally, the significance of region-level interaction to promote innovation is extending beyond traditional industrial sectors. Increasingly, the innovative inputs for new commercialised products are service-related, not manufactured components as was previously the case. Whether it is media content in mobile telephones or computer software in cars, there is a need for firms to find rapid solutions to problems that lie outside their main technological field; and for that, local, flexible firms are often a more agile partner.

18. For these reasons, the way firms organize their innovation is changing. And regional systems of innovation are becoming more complex (in terms of both the types of actors involved and the range of industries or technologies that are present) but also more crucial for firm competitiveness.

19. So, there are still strong advantages to a regional system of innovation that uses proximity to build the kinds of trust-based relationships on which open innovation and other forms of networked innovation depend.

20. At the same time, global networks are an unavoidable part of the world economy. Although until now these networks have been focused on production, the global networking of innovation is starting. As such, innovation offshoring could pose a threat to OECD regions that see knowledge assets as their principal competitive advantage.

21. All of this complicates the task of designing innovation policies that will be relevant and effective for regions. While public actors are not well-placed to predict the future, particularly in rapidly evolving markets, they can play a clear role in developing an environment that supports private actors in their efforts to adapt and seize opportunities.

Remaining research questions and policy issues for TDPC

- **What are the actual channels for technology information and acquisition**, and is there scope for change/amplification of these channels? Where are the existing gaps (communicative, cultural, management style) between firms and the technology supply infrastructure;

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5 For example, a study conducted by IBM Global Business Services with leading global corporations found that a combination of suppliers, partners and customers is a more significant source of innovation than a company’s employees and far more important than in-house R&D (see also von Hippel, 2005 and Chesbrough, 2003).

6 These issues are discussed in more detail in OECD (2007), Globalisation and Regional Economies: Can OECD Regions Compete in Global Industries?
• **What are the main barriers and incentives for collaboration** - clarification of what they are for different key actors in the innovation system (i.e. SMEs, large firms, universities, research institutes, technical service providers, etc.) to innovate and collaborate.

• **What is the most effective role for business in designing and implementing policy?** Given that evolution in markets is so rapid, how can information from the private sector be communicated to policymakers in a way that ensures that public policy support remains relevant and targets those firms or institutions that most need public support.

4. **How does TDPC address these questions?**

22. Current TDPC work is organised around the TDPC PWB 2007-8 activity “Measuring regional outcomes from innovation policy”. This activity builds on the 2005-6 activity “Innovation-led policies for regional development” (supporting the TDPC mandate to look at policies to enhance the competitiveness of regions).  

23. The work responds to the main questions and policy issues noted above in two ways: (1) **analysis of region-level innovation related data** in the context of ongoing work on regional indicators of competitiveness, and (2) **assessment of regional innovation capacity and the functioning of innovation systems and institutions**.

1. **Region-level innovation indicators**

24. A review of data availability is underway based on survey responses from member countries (survey circulated in April; responses received from most countries) and reviews of existing data sources (regional database, patent database, Eurostat data); (end 2007).

25. Analytical work based on this data has two main areas of focus (i) Linking innovation at regional level with growth (related to OECD-STI Intellectual Assets and Value Creation activity) and (ii) Linking regional innovation inputs with measurable innovation-related and economy-wide outputs.

26. This analysis will help to quantify the economic impact of innovation and the factors that promote high levels of innovation in some regions, as well as the constraining factors for under-performing regions. There will also be a special chapter on innovation in the next edition of *Regions at a Glance*.

2. **Regional innovation systems and capacity**

27. A key theme among the remaining questions is how to understand the mechanisms that link different actors involved in innovation. The project uses Regional Innovation Reviews to understand how

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7 The 2005-6 programme of work resulted in three OECD publications and conference proceedings


OECD (2006), *Competitive Regional Clusters: National Policy Approaches*

OECD (2007), *Higher Education in Regions: Globally Competitive, Locally Engaged*

OECD (2007), *Globalisation and Regional Economies: Can OECD Regions Compete in Global Industries?*
regional innovation systems function and the policy implications for national and regional actors in terms of strategy and resource allocation. An analytical framework will be developed to test key hypotheses. The work will help policymakers assess the overall performance of regions in terms of a standard set of competitiveness and innovation indicators. This framework will reveal areas of relative strength and weakness of the innovation performance of the region or regions under review, including comparisons with national and OECD standards.

28. Going beyond indicators, the aim is also to shed light on how policy makers can evaluate the functioning of the innovation system in regions, according to some key dimensions, such as governance of innovation across levels of government, funding flows and resource allocation, organisation of strategies and prioritisation, barriers and incentives to collaboration and to the participation of key non-government actors, etc.

29. Reviews are currently ongoing in Mexico, the UK and Italy. Additional reviews can be envisaged to give a broad range of regional types and national contexts.

Cooperation with STI

- There is already active ongoing co-operation with STI on both the innovation indicators and innovation reviews work.

Cooperation with EDU

- Two areas of co-operation could be proposed as a follow up to the Valencia conference. (1) Cooperation on a new round of case studies on HEI and regions with special attention to university /industry cooperation. And (2) organization of a high level forum on HEI and regions that will emphasise the role of HEI in regional competitiveness and innovative networks.

5. Scope for future work: TDPC’s contribution to the OECD Innovation Strategy

30. In the context of discussion of the next programme of work, TDPC should consider a contribution to the OECD Innovation Strategy that builds on current activities. This contribution could provide a comprehensive picture of

- The capacity to innovate of different types of regions and the relation between innovation and economic performance,

- The needs of different types of region (with respect to industry mix, level of development, education and skills structure, geography relative to markets, etc.) in terms of the most appropriate innovation strategy, prioritisation of instruments and effective resource allocation and governance of innovation resources.