

Building Innovative Capabilities through Public-Private Collaboration in Genomics and Biotechnology

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Genomics and biotechnology are critical for improving a number of areas of social and economic life. The most important feature of the 'new technological paradigm' in life sciences is the close collaboration between the public and private actors involved. This policy brief is based on an ESRC Innogen Centre project that examined the collaborative relationships between public policy, public research and private firms in Cambridge and Scotland. Empirical evidence from this research shows that public-private collaborations in the two regions play an important role in building firm-based and policy-making capabilities. For this reason it is recommended that regional policy should facilitate the formation and/or expansion of public-private collaborations for biotech innovation in both Cambridge and Scotland.

PUBLIC-PRIVATE COLLABORATION IN GENOMICS AND BIOTECHNOLOGY

In the era of globalisation, genomics and biotechnology are critical for improving a number of areas of social and economic life. Especially in the sector of human healthcare, recent developments in life sciences appear to constitute the main driving force of change. The most important feature of the 'new technological paradigm' in life sciences is the close collaboration between all the public and private actors involved. Among them are small biotechnology firms, venture capital companies, research institutes, universities and regional development agencies. Especially in genomics and biotechnology, public-private collaboration plays an important role in building and/or expanding dynamic capabilities for innovation in both firms and policy-making organisations.

This policy brief is based on an ESRC Innogen project¹ that examined in depth the complex collaborative relationships between public policy, public research and private firms in Cambridge and Scotland. Empirical evidence shows that although public-private collaborations in the two regions appear to be different in many respects, they play an important role in building firm-based and policy-making capabilities. Therefore, they contribute to regional innovation and development in both regions. For this reason, regional policy should facilitate the formation and/or expansion of public-private collaborations for biotech innovation in both Cambridge and Scotland.

EMPIRICAL EVIDENCE

Our empirical research indicates that public-private collaborations for biotech innovation in Cambridge and Scotland are historically founded upon social and political attempts to address the problem of division between direct production and academia. This resulted in the development of two distinct systems of innovation. On the one hand, in Cambridge, due to geographical, organisational and technological proximities, the university's liberal culture and the role of individuals in networking, the system was constructed from the bottom-up. On the other hand, in Scotland, due to specific economic, social, cultural and even political conditions, the system was constructed from the top-down.

Given their distinct systems of innovation, the two regions appear to sustain different types of public-private collaborations in genomics and biotechnology. For instance, in Scotland the bio-cluster is based on formal public-private collaborative networks which are supported by Scottish Enterprise. By contrast, in Cambridge the bottom up model of innovation allows the establishment of more informal public-private networks and collaborations. Despite their differences, both regions have at the very centre of their bio-clusters universities of great academic and research reputation. This implies generation of positive externalities namely 'knowledge spillovers' and skilled graduates. However, the Cambridge bio-cluster appears to be more fragmented and

discontinuous than the Scottish bio-cluster. The reason for this seems to be the absence of any strong conception of public interest as a criterion of public-private collaboration for genomics and biotech innovation in Cambridge. By contrast, in Scotland, public-private collaborations are guided by the public interest (or common good) of economic and social development of the region.

In both cases, our empirical findings show that, through complex public-private collaborations, regional firms mainly build learning capabilities in different areas of interest. These areas include intellectual property and project management, human resources, commercialisation, marketing, media representation, etc. By contrast, policy-makers build capabilities of balancing research and commercial interest as well as capabilities of learning and understanding of private firms, flexibility and fast response to constantly changing conditions. These findings are not surprising since previous research also indicates that organisational and institutional learning constitute fundamental characteristics of all hi-tech clusters. What is surprising is that public-private collaborations in genomics and biotechnology clearly fail to resolve the problem of managerial skills at the regional level. Our empirical research suggests that in both Cambridge and Scotland there is a serious shortage of managerial skills.

POLICY IMPLICATIONS

The cases of Cambridge and Scotland can be interpreted in different ways. On the one hand, policy makers can focus on differences and similarities in order draw general conclusions and develop policies also relevant to other regions with bio-clusters. On the other hand, policy makers may choose to address specific issues raised in this empirical research.

Generally speaking, the different types of public-private collaborations in Cambridge and Scotland imply the need for diversity of policy objectives, depending on the historical specificities of each system of innovation. In order to achieve the expressed objectives, policy makers also need to come up with specific measures to tackle problems such as the following:

- lack of established or deep bio-clusters which could contribute to regional competitiveness in the rapidly globalising economic world;
- fragmentation and discontinuity of public-private collaborations within bio-clusters;
- lack of high level managerial and marketing skills within small biotechnology firms;
- absence of a critical mass of small biotechnology firms, support organisations and skilled people in regional innovation systems.

POLICY RECOMMENDATIONS

On the basis of our empirical research findings, the following policies might be recommended at regional level:

- formulation of context specific measures in order for policy makers to strengthen both formal and informal connections between different components of the regional systems of life sciences innovation. These measures might not only include public support to professional networks and the establishment of an environment conducive to social networking, but also promotion of connections of firms with national and international networks;
- stating clearly the link between regional public interest in socio-economic development and life sciences innovation so that integration of public and private objectives can be achieved at the level of university-industry-government relations;
- supporting the development of biotech management training programmes to meet the need for specific skills in specific regions;
- improving regional infrastructure and framework conditions of biotech innovation so that regions can become competitive and attract both small firms and big multinationals as well as skilled people.

NOTE

1. This research is based on documentary analysis (inc analysis of academic journal articles, policy papers and reports, DBF websites, company brochures and press articles) and in depth interviews with a range of public and private actors (including high level managers of biotech companies and industry stakeholders, policy makers and scheme managers, scientists and life science consultants).

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