Policy Briefing

NESTA Making Innovation Flourish

History Matters
Unlocking innovation in British cities and regions

Innovation performance varies substantially across Great Britain[1] and the different history of each city-region has a substantial bearing on its economic position today. But until recently, regional development policy has not reflected either the functional status of city-regions, nor taken full account of their histories.

But this is a major oversight. City-regions with traditional heavy industries have found it harder to adapt to new ideas than those starting with a clean industrial slate. The point is amply illustrated through a case study of two contrasting cities – Cambridge and Swansea – with dramatically different innovation outcomes flowing from their particular histories.

Policymakers need to develop an historical awareness in crafting regional innovation policy. City-regional governments should think carefully about how their unique historical development might determine their strategies for the future. And each city-region is different: breaking from an existing, low-innovation path is about more than applying a generic 'regional innovation' formula.

Uneven innovation across the UK has historical roots

Innovation is uneven across the UK, occurring in high-innovation clusters
Innovation performance varies substantially across the UK, with some regions and localities performing well above the national average.[2] However, many of today's innovation outcomes reflect unique historical attributes.

A new NESTA research report shows how the long-term economic and structural development – including industrial specialisation – of British cities and regions has helped determine their success or failure.[3] But regional agencies have until recently failed to adapt to such diversity.

There remains a tension between arbitrary administrative boundaries and economic and social reality

Regional boundaries rarely reflect economic reality
National and regional administrative boundaries provide frameworks for government policies and strategies. National boundaries reflect distinctive national histories, with devolved powers since 1999 reflecting these.

But the nine English regions were largely an administrative convenience. Their current borders were established in 1994 with the Government Offices of the Regions, reinforced by new Regional Assemblies and Regional Development Agencies (RDAs) in 1998.[4]

Below these regions, and over centuries, a patchwork of local authorities has grown up. Their borders are no less arbitrary, established by convention, local identities, national reform or even gerrymandering. Rarely have they reflected economic need.

Recent reforms have attempted to reshape regional and local government on economic lines
Government has historically attempted to deliver regional development policies through this thicket of institutions and authorities. But economies vary as much within regions as between them: they can span towns, cities and rural areas that cross administrative boundaries. Recent reforms and initiatives have attempted to address this by shifting the focus of economic development policies to a lower tier of government.

The 1998 Competitiveness White Paper and the then Department of Trade and Industry's cluster mapping identified regional and sub-regional areas for economic development. Six English 'Science Cities' promoted a more widespread

5. The six 'Science Cities' are York, Birmingham, Bristol, Manchester, Newcastle, and Nottingham.

6. Office of the Deputy Prime Minister (2006) 'State of the English Cities.' London: ODPM.

7. HM Treasury (2007) 'Sub-National Economic Development and Regeneration Review.' London: HM Treasury.

8. NESTA analysed the innovation outcomes for different forms of innovation shown in the results of the Fourth Community Innovation Survey (CIS4) for all 63 cities in Great Britain with core populations greater than 125,000. The results of this analysis reveal a wide variation in innovation outcomes between British cities. See Simmie J., Carpenter, J., Chadwick, A. and Martin, R. (2008) 'History Matters: Path dependence and innovation in British city-regions.' London: NESTA. Chapter 3.

9. Ibid.

10. Based on the analysis of the different forms of innovation shown in the results of the CIS4 data. See Ibid. Chapter 4.

11. Based on the analysis of the different forms of innovation shown in the results of the CIS4 data. See Ibid.

12. HM Treasury (2006) 'Barker Review of Land Use Planning – Interim Report.' London: HM Treasury.

13. Simmie J., Carpenter, J., Chadwick, A. and Martin, R. (2008) 'History Matters: Path dependence and innovation in British city-regions.' London: NESTA. Chapter 4. Cambridge Consultants was established in 1960. The 1969 Mott Report led to the new science parks.

14. What is perhaps more striking is that almost all of what were the major growth sectors (in employment terms) of the 1980s – in many cases experiencing overall growth rates of more than 10 percent – have since lost their dynamism. The activities concerned include not just some older manufacturing industries (such as 'Manufactured wood products', 'Chemical products' and 'Medical and precision instruments') but also more modern sectors such as 'Computing and related activities'.

15. Simmie J., Carpenter, J., Chadwick, A. and Martin, R. (2008) 'History Matters: Path dependence and innovation in British city-regions.' London: NESTA. Chapter 4.

engagement between businesses and researchers to boost innovation.[5] In 2006, the Department for Communities and Local Government (CLG) published a comprehensive review of urban performance in England and the impact of government policies upon cities.[6]

HM Treasury's 2007 'Review of sub-national economic development' (SNR) devolved greater powers to local authorities to promote economic growth and strengthen collaboration between local authorities in functional city-regions, with the latter recognised as important enablers of economic growth.[7]

But history matters more than geography in shaping the UK's city-regions

History, not geography, leads distant cities like Middlesbrough and Swansea to share similar experiences, and near neighbours like Cambridge and Norwich to differ widely.

Notably, these cities' different levels of innovation owed more to chance than clear planning. In some areas, the absence of well-established institutions and the lack of an industrial legacy have enabled rapid innovation. Leading innovative British cities such as Aldershot, Cambridge, Northampton, Oxford, Reading and Warrington all display a lack of industrial heritage and an absence of innovation strategies.

Some cities have struggled with the burden of their own history

Globalisation has brought distant places closer and intensified competition between them. British cities adapted differently to this increased international competition.

Traditionally-strong industries have become weaknesses, preventing city-regions from adapting flexibly to globalisation. Former industrial centres like Swansea, Newport, Wakefield and Middlesbrough have struggled to remain competitive.[8] Others, such as Bristol and Leeds, have risen to the challenge, re-inventing their old industrial activities and creating new ones.[9]

In Northern England, some modern industries, such as pharmaceuticals, fine chemicals, advanced materials and precision engineering have grown out of old existing regional specialisations in heavy industries such as steelmaking and bulk chemicals.

Cambridge and Swansea: two contrasting histories

Cambridge and Swansea exhibit quite different economic histories, and their disparate innovation performance over the past two decades reflected these differences. On several metrics, Cambridge has been one of the most innovative British cities;[10] Swansea one of the least.[11]

A new industrial sector typically goes through four phases to emerge and decline

Pre-formation phase – Existing institutions and technologies shape the opportunities for new developments. Several different new technologies or industries may co-exist. Industrialisation in the 19th century left Swansea with a legacy of highly-specialised skills and institutions that could not easily adapt to the needs of 20th century sectors. Cambridge's economic structure, by contrast, was only marginally affected by industrialisation and from the 1950s maintained strong planning restrictions to preserve its historic character.[12]

Path creation phase – Circumstances or planned actions help develop momentum and critical mass. In Swansea, the decline of existing industries from the 1960s prompted the Welsh Development Agency (WDA) to promote the city as an attractive location for relatively low-wage, low-skilled manufacture. Some multinationals (such as Sony) were attracted by the offer. Advanced technology firms were encouraged in Cambridge by Cambridge Consultants promoting university-business links and by new research-based science parks.[13]

Path dependence phase – This new development begins to attract other actors and a critical mass begins to form. Once this critical mass achieves a certain size or momentum, the new industrial path gets 'locked-in', leading to a phase of cumulative and self-reinforcing development. A lack of momentum in Swansea prevented the formation of a critical mass in its volume-manufacturing base, leading eventually to its decline under pressure from cheaper competitor economies in East Asia and Eastern Europe.[14] Cambridge's high-tech communications economy has become progressively more diversified with up to 15 different sectoral pathways mainly based around IT and biotechnology activities.[15]

Path decay phase – Loss of momentum and development as a result of rising external competition or an internal decline in dynamism. Technological lock-in in Swansea has produced two major waves of growth and decline, with the local economy too closely tied to technologies later overtaken by development elsewhere. But

even Cambridge may be succumbing to such inertia. Many of its new pathways are linked by similar underlying theories of advanced computing. Various commentators have also highlighted barriers to cluster growth in Cambridge's restrictive planning system.[16]

A city-region's innovation system determines its ability to start new sectoral trajectories

City-regions must be able to escape their past to create new economic futures
Continual growth is never guaranteed; there is a need for constant change and reinvention. This requires ongoing innovation as well as an ability to absorb and adopt new knowledge from elsewhere.[17] Continual change and adaptation in existing pathways requires the creation of new knowledge and its commercialisation in national and world markets. This generation of novelty and innovation are the main underlying drivers of both economic path development and new path creation.

Recognition of the spatial and historical dimensions to innovation policy is vital
City-regions risk becoming victims of their own history, unless they have clear policies to support innovation. Even those currently successful city-regions could become locked-in to older technologies and institutions as the economy changes.

But even if it is rooted in specific histories, city-regional innovation policy must face outwards. The most innovative city-regions across the world are increasingly linked together in global innovation networks. Businesses in Cambridge, for example, report that their global networks are more important than their local ones.[18]

New innovation trajectories can be created from multiple sources

The creation of new paths for technological or industrial development within a city-region depends critically on that region's previous history. Its past industrial development determines three things:

- The types of occupation and skills available to support different sectors.

- The knowledge assets and infrastructure from private and collective investment.

- The individual and collective capacities available to exploit learning and knowledge.

It is difficult for new ideas to start in old industrial places
Nineteenth century industrial legacies can be difficult to overcome; but technological lock-in can also occur where new technologies quickly become dated.

New development pathways often arise as a result of the actions of 'star individuals'
Cambridge's success is partly based on the chemical engineer who set up Cambridge Consultants in 1960. The Vice-Chancellor of Swansea University inspired the 2001 Technium Programme that has successfully supported a small number of new and growing knowledge-based industries. Importantly, however, both these path-breaking innovations were followed by changes in the attitudes of the two universities to research-based industrial development.

Businesses are critical in commercialising new knowledge
While universities are an important part of the local knowledge base, businesses rather than local universities (a few key individuals excepted) play the central role in commercialising new knowledge and establishing new sectoral paths.

Diversity can arise in clusters
New economic pathways can also be opened by diversifying into new industries closely related to existing ones, a phenomenon known as 'clustered diversity'. In Cambridge, new pathways have been created by diversifying from the existing specialised knowledge base.

Cultural and institutional development will affect growth trajectories
The growth trajectories of city-regional economies do not only reflect economic factors. Other institutional and cultural influences evolve alongside city-regional economies, sustaining and supporting their development in some places, holding growth back in others. If the pace of institutional change lags behind economic transformation, this is likely to slow development and reinforce technological lock-in.

Understanding the virtuous and vicious cycles of local economies' evolution can help policymakers identify windows of opportunity when they emerge
Once a particular pattern of development is established, it can become self-sustaining. It is then characterised by a high degree of persistence or 'path dependence'.[19] Such local processes and histories condition local innovation outcomes.

The cost of breaking from existing institutional and technological structures can be very high, creating a vicious circle of decline. Or the synergies between existing structures in a city-region can allow it rapidly to exploit new

16. Lord Sainsbury (1999) 'Biotechnology Clusters: report of a team lead by Lord Sainsbury, Minister for Science.' London: DTI. p.41.

17. There is a significant positive relationship across regions between innovative activity (as measured for example, by firms reporting the introduction of new products in CIS4) and economic growth: in general, faster growing regions and sub-regions tend also to be those with higher rates of innovative and technological activity.

18. Simmie J., Carpenter, J., Chadwick, A. and Martin, R. (2008) 'History Matters: Path dependence and innovation in British city-regions.' London: NESTA. Chapter 5.

19. Martin, R. (2003) 'Putting the economy in its place: On economics, geography and the economic landscape.' Paper presented at the workshop on evolutionary economics and economic geography, University of Utrecht, 24 October.

knowledge, creating a virtuous circle of self-sustaining growth.

Large interventions have the greatest chance of success

Large-scale and multi-purpose initiatives combined with policies that tolerate a degree of redundancy are more likely to be successful
Northampton and Warrington's successful town expansion plans were based on a broad set of objectives none of which were specifically targeted on innovation.

The universities of Cambridge and Oxford are also large-scale institutions with multiple objectives out of which innovations sometimes emerge. Successful policy needs to be able to tolerate such redundancy, and the seemingly indirect link between interventions and eventual outcomes.

City-regional policy must become historically aware

City-regional policymakers need a clear and realistic vision derived from their region's history
Cities and city-regions should be actively aware of their capacities. Most RDAs claim or aspire to host biotechnology clusters; but city-regions should develop distinctive policies that play to their existing strengths, rather than aiming for improbable outcomes given their history and existing institutions.

When designing city-region innovation policies, policymakers should reflect critically on the history of their region and avoid simply replicating successful strategies from elsewhere. Regional policymakers should think creatively about engaging local histories and historians to construct a compelling regional innovation narrative.

Local authorities should have greater influence than national government on city-regional growth policies
Local authorities have a range of powers that have an immediate impact on a city-regional economy, particularly in planning. They are also more likely to be aware of how historical processes have shaped the local economy. Local governments should be keenly aware of their own potential to support city-regional innovation.

To be successful, policies often require longer timeframes
Policy evaluation across the city-region needs properly to account for the longer-term impacts of successful outcomes. Planning horizons in city-regional economic areas should be extended to the 15 or 20 year time frames of current Regional Spatial Strategies.

Develop outward-looking networks to encourage the search for new ideas beyond the city-region
UK cities that aspire to join the world's leading innovators must be internationally connected, and build their specialised niches using global innovation networks. Policymakers should support international visits and links with UK embassies to enter new markets and establish distributors.

Regional policymakers should work with the Department for Innovation, Universities and Skills (DIUS) and the Foreign and Commonwealth Office to explore ways to market their regions through DIUS's science and innovation network.

Develop a community of highly-skilled innovation experts in each city-region
The development of innovation strategies adapted to the specific socio-economy history of a city-region needs highly skilled policymakers. Innovation experts who can help devolved administrations, RDAs, local authorities should be willing to work with a wide range of actors, including historians and those involved in previous development cycles.

Such innovation policy professionals must be aware of the history of their city-region and be well trained in recent developments in the business, theory and practice of innovation policy. This role should be prestigious and externally accredited, drawing on existing programmes such as Masters courses in Public Administration.

Local authorities should make full use of Multi-Area Agreements to support development in their city-regions
Few city-regions have a single local authority. But new CLG guidance on Multi-Area Agreements (MAAs) allows for co-operation between authorities across their own boundaries in the delivery of services. Government should support those local authorities creatively using these agreements to deliver support for innovative city-regions.

Better coordinate the 'non innovation policies' that influence innovation
Framework conditions such as taxation, competition, regulation, public procurement, intellectual property regimes, and public sector performance targets all affect innovation. As a result, policies ostensibly unrelated to innovation can impact on incentives to innovate. Therefore, regional innovation policy should not be thought of in isolation.