

Towards a place based science and innovation strategy for England: a role for universities?

A paper for the BEIS Advisory Group on Smart
Specialisation and Innovation Audits



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Contents

Executive Summary

Political context

Current policy

Can smart specialisation provide the basis for a place based innovation strategy?

Implications of EU experience for UK policy

The investment planning process

The challenge ahead

Conclusion

Immediate action points

Acknowledgments

Executive Summary

Context

This paper responds to the Prime Minister's commitment to "re-balancing the economy across sectors and geographical areas and spreading wealth and prosperity around the country" and "to opening our minds to new ways of thinking in government and business" with business playing a role "not just in the economic life of our nation but in our society too".

It links this to Secretary of State's aspiration that "many of the policies and decisions that that form our industrial strategy will not be about particular industries or sectors but will be cross-cutting".

Linking science and innovation **and** territorial cohesion speaks to the multi-faceted role of universities as key civic institutions serving the public good in the communities where they are located. The paper therefore makes the case for universities fostering innovative environments in less successful places as one of the cross – cutting themes in the emerging industrial strategy.

Public policy needs to recognise that many places that are lagging behind benefit from universities as anchor institutions contributing significantly to 'place making' and mobilising the innovative capacity of their communities.

Current Policy

A basis for this local perspective to innovation can be found in in the smart specialisation strategies that were an *ex-ante* conditionality for the UK being awarded European Structural and Investment Funds to support innovation. The principal aim of EU regional innovation policy has been to bridge the innovation divide within the Union revealed by evidence that a poor innovation record in lagging regions is underpinning widening regional disparities in economic growth and holding back the overall economic performance of Europe.

In the UK LEPs have been encouraged to develop their own smart specialisation strategies and have been able to draw on the support of a Smart Specialisation Advisory Hub in connecting top down and bottom up perspectives. This hub has been based in the National Centre for Universities and Business in recognition that universities could play a key role in shaping and implementing smart specialisation strategies.

In parallel with this process, and partly in recognition of the fact that many LEP areas were too small to pursue a meaningful innovation strategy, Science Minister Jo Johnston has called upon "*local areas to develop 'audits' mapping local research and innovation strengths and infrastructure. These deep dives will provide a new way to identify and build on areas of greatest potential in every region*". This was to form part of the Government's One Nation Science agenda which would "**take a more thoughtful approach to place**".

There have been two other stands of innovation policy that have an indirect bearing on place based innovation. Catapult Centres are physical sites and some are found in localities with a limited track record of innovation. However with the possible exception of the City Futures Catapult these centres do not have an explicit territorial development responsibility.

These national innovation orientated initiatives need to be seen alongside the generic role of universities in working with business and the community. HEFCE has continued to encourage universities to support innovation regardless of its geographical impact through its Higher Education Innovation Fund (HEIF). HEIF is intended to *“support: the full range of Knowledge Exchange activities, unlocking the potential of institutions, staff and students; and partnerships with businesses, public and third sectors, communities and the public, as well as the enterprise agenda”*

While universities are independent and competing institutions HEFCE is encouraging them to collaborate with each other in relation to HEIF so as to maximise the efficiency and effectiveness of public funding in this domain and to reflect the fact that different types of institution might have complementary roles in relation to different stages in the innovation process – ranging from basic through applied research to skills development that can support the adoption of new technologies in businesses where collaborative research is underway. HEFCE has also launched in partnership with the Local Government Association a programme entitled ‘Leading Places’ designed to develop leadership capacity for working between universities and local authorities.

EU Smart specialisation and place based innovation strategies

UK led research into the adoption of smart specialisation in various European regions points to the need for a regional innovation system perspective in which innovation is viewed as an evolutionary, non-linear and interactive process requiring intensive communication and collaboration between different actors – firms, universities, local authorities, innovations centres, financial institutions, chambers of commerce and last but not least citizens and consumers who can on occasions be co-producers of knowledge.

A key issue here is that there are regional differences in the capacity of actors to work together to support innovation with lagging regions often being ‘institutionally thin’. In some regions key components needed to underpin innovation may be missing – knowledge generation capacity, absorptive capacity in business, collaborative capacity to work between institutions and leadership capacity to orchestrate the ecosystem. This certainly applies in some UK left behind regions.

In this context universities can have multiple roles as regional capacity builders: as creators of knowledge; as knowledge reservoirs; as global knowledge antenna; as human capital creators; as transferors and commercialisers of knowledge; as regional leaders; as influencers of the image and identity of regions and as connectors to local civil society. Such institutions can be referred to as civic universities participating in quadruple helix partnerships that embrace citizens as well as businesses and government.

One approach to building this collaborative capacity is through diverse actors coming together to address Grand Challenges such as environmental change and demographic ageing that confront most regions. In a European policy context linking smart specialization and grand challenges is potentially one way of creating the elusive synergies between regional policy and research under Horizon 2020 given the challenge focus of the latter. This approach resonates with the EC adoption of principles of Open Innovation, the cross cutting theme in Horizon 2020 of Responsible Research and Innovation (RRI) and ideas of the city as a ‘living laboratory’ for testing new ways of working.

The EU experience suggests that a place based innovation strategy should not take the form of a one size fits all approach, not least in terms of expecting knowledge generation from research to produce downstream local innovation. This is particularly the case in lagging regions lacking current absorptive capacity in local businesses and collaborative and leadership capacity. Rather the priority

should be to invest long term in building this institutional capacity. In this regard cities, small and large, as institutional hubs and meaningful 'places' are of critical importance.

Implications of EU experience for UK policy

A shift in balance between 'investing in success' to 'tackling underperformance' is appropriate and timely – especially in terms of coping with the inevitable economic shocks BREXIT negotiations will engender. This must involve spreading the agglomeration economies of the 'powerhouse' cities to smaller cities in their hinterland. Most of these places do have some assets of international quality, where universities are key. These can be built upon, for example through embedded science and business parks and linked skills development programmes. Equally important is the valorisation of cultural and heritage assets through the endeavours of university arts and humanities departments. This can feed into the development of distinctive (specialised) local cultural economies supported by the rapidly developing digital sectors found in many smaller cities outside of London.

Central to this approach is the need to link regeneration policies with their focus on 'place making' with territorially sensitive innovation policies. Universities as key urban anchor institutions with a clear physical footprint in cities, can help bridge the long established gap in the UK between industrial and urban policy by providing a placed based dimension to the former. Innovation requires regular contact between researchers, students and business and this can be helped by premises where relationships can be forged. It also needs institutional mechanisms to facilitate collaborative work, possibly through a special purpose vehicle. As part of urban regeneration schemes such sites can be a test bed for new technologies.

The sites need to be an integral component of a local development strategy to meet global challenges such as environmental sustainability and demographic ageing. In relation to the former, plans for local energy production, distribution and security, for decarbonisation, for flood management and for the green economy are all opportunities. Likewise how the city and its public services are organised across a wide range of activities to meet the needs of an ageing population are opportunities for social innovation. While this may be a tall order for a large and complex city it is a more realistic possibility for the smaller cities with a university in the north of England possibly working with a major core city and its universities.

The investment planning process

The above perspective needs a new approach to urban investment. Universities as long established, autonomous public bodies could play key role in shaping and participating in investment planning. The shift of investment finance from standalone projects developed with shorter term perspectives by individual institutions towards more strategic programmes led by local partnerships over a much longer 'mortgage length' perspective, means it may be appropriate to think of the different funding sources as working together, albeit accounted for separately. This could embrace funds awarded to universities for research.

If universities are going to be key actors as place makers they will need stronger connections to combined and local authorities not least because of the latter's land holdings and planning powers and ability to lever cheap capital finance, especially if it can be secured against localised business rates **and** university research and teaching income. . Local NHS institutions are obvious additional partners given the radical transformation of the health service infrastructure underway and the fact that many hospital trusts have deep relations with universities and teaching hospitals are sometimes located alongside university campuses.

The challenge ahead

To complement the innovation audits and build on the lessons from smart specialisation this paper has suggested that policies to enhance the role of universities as anchor institutions in left behind city regions could be an important component of a place based innovation strategy. However some institutions wishing to play this role face a challenging environment. A 2016 P.A Consulting survey of university leaders views on 'the unsettled outlook for higher education' suggests that 43% of VCs think that it is 'very or somewhat likely' there will be as significant number of institutional failures and 76% predicted 'rationalisation of provision through consolidation, transfers and course closures'. Higher education statistical data do suggest a widening financial gap between the best and weakest performing institutions. An independent published paper in the Cambridge Journal of Regions, Economy and Society suggests that some vulnerable institutions can be found in vulnerable places where universities are key anchor institutions.

To counter these possible threats a place based innovation strategy needs mechanisms to support the development of the anchoring role of universities in the more disadvantaged city regions of England. The Green Paper on the industrial strategy could be an opportunity to introduce new thinking about a territorial dimension to industrial policy which could incorporate a strong innovation ecosystem strand. This would involve government support for building institutional capacity for so called 'quadruple helix' collaborative partnerships between all universities and further education colleges in an area, business, local and central government and the voluntary and community sectors

Such broadly based partnerships should recognise the changing nature of innovation including open and social innovation and the importance of co-production of knowledge between researchers and local users. The various actors would need to work together to unlock local business and community potential for innovation broadly defined and address the barriers to realising that potential. The focus could be on innovations that might contribute to addressing grand challenges, such as ageing and sustainability, that are local but have a potentially global market place for goods and services and where the 'place' can be a test bed or living laboratory. In going down this route most places should not aim to be at the leading edge in the development of new technologies or to become a Cambridge 'look alike'.

In designated cities universities could be asked to play a key 'convening' role in the formation of a local innovation ecosystem by: identifying unique local assets through shaping 'smart specialisation' strategies and Foresight exercises; addressing the skills gaps inhibiting innovation; fostering the take up of platform technologies; providing global-local linkages for SMEs and attracting inward investors to use the 'laboratory'. This endeavour will need to be underpinned by long term co-investment by universities and public authorities in physical 'place making' infrastructure that can generate returns to finance the capacity building activity of the partnerships.

Immediate action points

1. Building upon the science and innovation audits BEIS and HEFCE identify a lagging city region and its universities, LEPs and local local/combined authority with unrealised innovation potential willing and able to pilot the approach set out in this paper. This may involve linking a northern powerhouse city/university with a smaller city and post 92 university in its hinterland
2. Creating central capacity, possibly building on an entity like the smart specialisation hub, to support the pilot and develop mechanisms for connecting this bottom up approach to the evolving top down national industrial strategy including facilitating cross city region collaborative programmes, links to Catapult centres and to national innovation centres located in but not connected to their host city region
3. Monitoring the possible impacts of the Higher Education Bill on the capacity of universities to perform an anchor role lagging city regions

Towards a place based science and innovation strategy for England: a role for universities?

Political Context

This paper should be read in the context of the Secretary for State for Business, Energy's desire to see a place based dimension to innovation within the emerging industrial strategy. He has noted that "scientific knowledge may be universal but its development is local" and "for too long Government has treated every place as if it were identical...many of the policies and decisions that form our industrial strategy will not be about particular industries or sectors but will be cross-cutting". His remarks also need to be seen in the context of the Prime Minister's speech to the CBI where she has signalled the Government's commitment to "re-balancing the economy across sectors and geographical areas and spreading wealth and prosperity around the country" and "to opening our minds to new ways of thinking in government and business" with business playing a role "not just in the economic life of our nation but in our society too".

The Government's agenda for science and innovation **and** territorial cohesion speaks to the multi-faceted role of universities as key civic institutions serving the public good in the communities where they are located. The paper makes the case for universities in fostering innovative environments in less successful places and as one of the cross – cutting themes in the emerging industrial strategy.

In view of this potential role it is important to note that in parallel with search for a place- based science and innovation agenda the Government is pressing ahead with a major restructuring of the higher education and research landscape. England is fortunate in having an excellent geographical coverage of higher education. Many of places that are lagging behind benefit from universities as anchor institutions contributing significantly to 'place making' and the innovative capacity of their communities. However the impact of the impending regulatory changes on individual universities and their capacity to contribute to local innovation remains uncertain. This uncertainty is particularly problematic when linked to the expectation in many devolution deals that universities can be key actors in new devolved territorial governance structures.

Current Policy

What basis for this local perspective can be found in current science and innovation policy? The most pertinent pointers can be found in smart specialisation strategies that were an *ex-ante* conditionality for the UK being awarded European Structural and Investment Funds to support innovation. These strategies are intended to contribute to the European objective of moving towards the Lisbon Treaty objectives of **Smart, Sustainable and *Inclusive* Growth**. (My emphasis). The principal aim of EU regional innovation policy has been to bridge the innovation divide within the Union revealed by clear evidence that a poor innovation record in lagging regions is

underpinning widening regional disparities in economic growth and holding back the overall economic performance of Europe.

To respect principles of subsidiarity the Commission allowed member states to adopt either a national **or** regional perspective to the design of their strategies. The UK adopted the former in its settlement with the Commission by arguing the case for linking this policy to its national industrial strategy. This strategy did not at the time have an explicit territorial dimension and was not intended to address the challenge of lower rates of innovation in lagging regions.

With regard to the role of universities, Sir Andrew Whitty's was commissioned by the Coalition Government to report on 'Universities in their Local Communities: Enabling Economic Growth', more specifically to explore "*the range of ways that universities contribute to their local economies including as agents of research and innovation, as providers of skills, employers, purchasers of goods and services, and as facilitators bringing people together*" and "*how to create an integrated strategy between the local and national players*" He ended up urging that funding should be structured "*by technology/industry opportunity – not by postcode and embracing the country's density of population and institutions.*" Notwithstanding this exhortation in practise LEPs have been encouraged to develop their own smart specialisation strategies and have been able to draw on the support of a Smart Specialisation Advisory Hub in connecting top down and bottom up perspectives. This hub has been based in the National Centre for Universities and Business in recognition that universities could play a key role in shaping and implementing smart specialisation strategies.

In parallel with this process, and partly in recognition of the fact that many LEP areas were too small to pursue a meaningful innovation strategy, Science Minister Jo Johnston called upon "*local areas to develop 'audits' mapping local research and innovation strengths and infrastructure. These deep dives will provide a new way to identify and build on areas of greatest potential in every region*". This was to form part of the Government's One Nation Science agenda which would "**take a more thoughtful approach to place**". This adds to the view that research capacity in universities should be a key component of a place based innovation strategy. The audits that have been approved span LEP boundaries with universities playing to their research strengths.

In parallel there have been two other stands of innovation policy that have an indirect bearing on place based innovation. Catapult Centres are physical sites and some are found in localities with a limited track record of innovation. However with the possible exception of the City Future Catapult these centres do not have an explicit territorial development responsibility. At the same time and under the umbrella of the Northern Powerhouse, *National* Centres of excellence at Manchester University in graphene and at Newcastle University on ageing science have been funded by the Treasury but with no specific regional remit, although the Newcastle centre does have responsibility to foster innovation. Significantly the funded has been channelled via the research councils, possibly as an indicator of how in the future UKR&I may work.

These national initiatives need to be seen alongside the generic role of universities in working with business and the community. HEFCE has continued to encourage universities to support innovation regardless of its geographical impact through its Higher Education Innovation Fund (HEIF). HEIF is a formula allocation calculated using income from contracts with business and public bodies as a proxy for impact on the economy and society. HEIF has been drawn from both the ring-fenced science/research budget and the HEFCE teaching budget as an indication that engagement with the wider world can involve both teaching and research. HEIF is intended to "*support: the full range of Knowledge Exchange activities, unlocking the potential of institutions, staff and students; and*

partnerships with businesses, public and third sectors, communities and the public, as well as the enterprise agenda. Helping the country's growth and productivity is a high priority".

The Government has confirmed its long-term commitment to funding Knowledge Exchange and HEFCE is seeking a long-term strategic approach to future HEIF funding *"to reflect enduring institutional and academic capabilities and partnerships, identification of the sectors that will benefit, and how institutions will measure success"*. Notwithstanding the challenge of the financial sustainability of this activity HEFCE is looking for long-term impacts to help counter the concern that universities focus on income generation rather than long-term developments which might not bring immediate rewards. However, there is no specific requirement for these strategies to contribute to place-based innovation or more particularly to bridging the innovation divide between different parts of the country. While universities are independent and competing institutions, HEFCE is encouraging them to collaborate with each other in relation to HEIF so as to maximise the efficiency and effectiveness of public funding in this domain. This encouragement no doubt reflects the fact that different types of institution might have complementary roles in relation to different stages in the innovation process – ranging from basic through applied research to skills development that can support the adoption of new technologies in businesses where collaborative research is underway. But while there are some regional collaborations of research-intensive universities in certain parts of the country, such as the N8 in the North of England, generally speaking universities only formally come together according to their positions in an academic hierarchy of institutions. However, one such group of 19 principally post-'92 universities, the Alliance Group, does present itself as 'Britain's Universities for Cities and Regions'

Can smart specialisation provide the basis for a place-based innovation strategy?

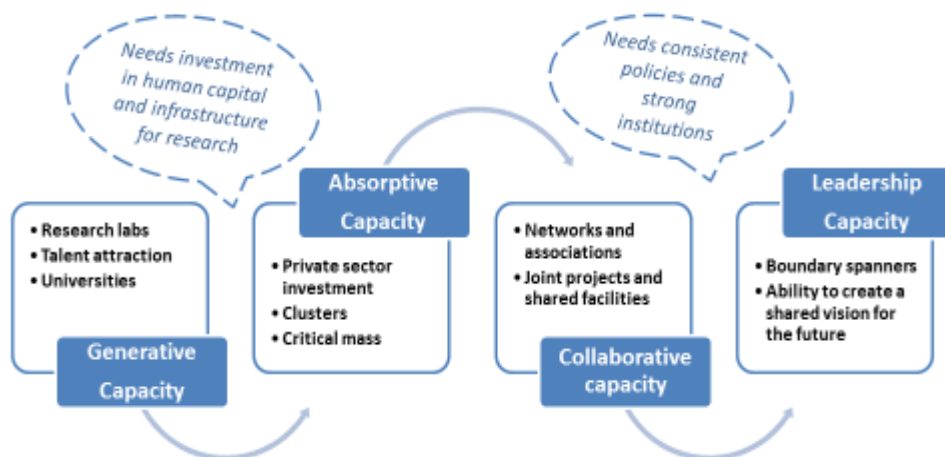
The design and implementation of smart specialisation strategies across Europe has been subject to academic review in an EU Research Framework study led by Cardiff University and some of the key insights are summarised below, again with a particular emphasis on the role of universities.ⁱ

Smart Specialisation was developed on the basis of a critique of earlier regional innovation policy across Europe. This focussed on building up research excellence in regions, the attraction of global high-tech companies and the stimulation of spin-offs. Such policy has often been used in an undifferentiated manner for all kinds of regions. The specific strengths and weaknesses of regions in terms of their industries, knowledge institutions, innovation potential and problems were frequently not taken into account. Furthermore, regions often operated in an isolated manner with actual and potential interrelationships with other regions and with higher spatial levels (national, international) ignored. The research suggests that the success of a region in pursuing a science-led strategy will be dependent on the presence of other (non-science-related) economic factors supporting entrepreneurship and industrial development (access to finance, supplies of human capital, supportive governance environment, etc.) and these are less likely to be a feature of poorer developed regions. This highlights the dangers of equating 'research excellence' in universities with the ability for a regional economy to support innovation.

In contrast, smart specialisation expects the adoption of a regional innovation system perspective in which innovation is viewed as an evolutionary, non-linear and interactive process requiring intensive communication and collaboration between different actors – firms, universities, innovation centres,

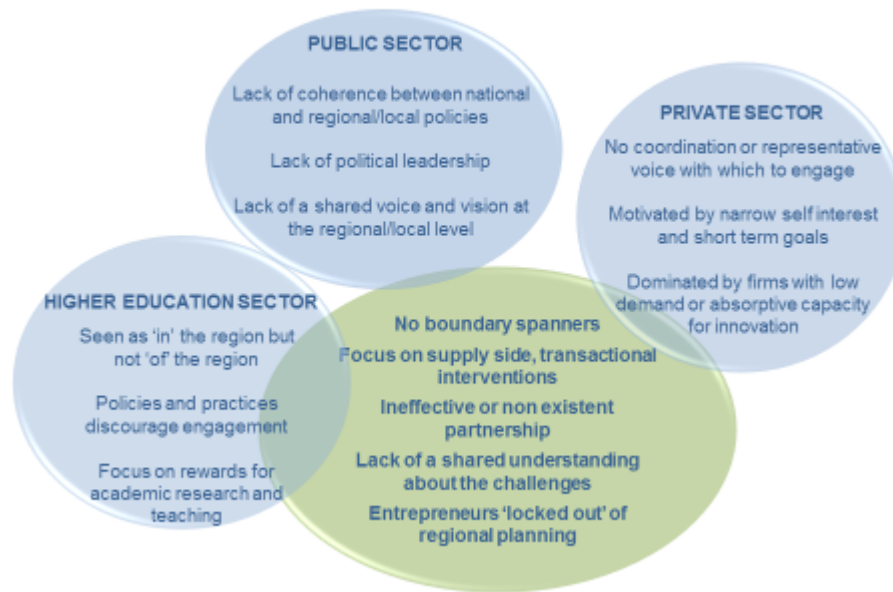
financial institutions, standard setting bodies and industrial associations and last but not least citizens and consumers who can on occasions be co-producers of knowledge. In such eco- systems a key role is played by hard or formal institutions (such as universities, businesses, local authorities, voluntary organisations and the regulations governing their activities) and soft institutions (practises, norms, routines) in shaping the behaviour of actors and the interaction between them. A key issue here is that there are regional differences in the capacity of actors to work together to support innovation with lagging regions often being ‘institutionally thin’. This particularly applies in countries like the UK where universities are not incentivised to engage in building local innovative capacity and local governments have limited expertise in science and innovation policy. More generically in some regions there may lack one or more of the key components needed to underpin innovation – knowledge generation capacity, absorptive capacity in business, collaborative capacity to work between institutions and leadership capacity to orchestrate the ecosystem. This is summarised below:

Capacity building in regional innovation systems



The lack of absorptive capacity in business may be rooted in the dominant forms of business organisation in these economies. The business sector may be specialized in low- and medium-tech segments and unable to benefit from the results of the public research system. There may be a reliance on foreign direct investment with such firms having limited links with indigenous knowledge institutions and business. And firms in lagging regions are more likely to be more dependent on learning-by-doing through practical problem solving and responding to customer needs than on participation in or access to leading edge scientific-based R&D processes. The diagram below summarises such regions as institutionally disconnected.

The disconnected region



Smart specialisation can be viewed as a response to these challenges. It has been defined by the principle architect of the concept, Dominic Foray, in the following terms:

“A process of diversification through the local concentration of resources and competences in a certain number of new domains that represent possible paths for the transformation of productive structures. ... [A] smart specialisation process is embedded in productive structures and capacities that are local but whose transformation requires new resources, new technologies and new competences, perhaps generated within the same local area although they may also come from outside. ... [W]hat can emerge as a smart specialisation is a new activity where an innovative project complements existing productive assets”

Phillip McCann has elaborated on the concept in the following terms:

“The mutual embeddedness of firms, labour capabilities, technologies and institutions within regional contexts; the relatedness of future development paths to the existing technologies and knowledge bases of the main industries in the regions which enables diversification processes; and the connectivity of regions to flows of knowledge, trade, finance, and people that allows them to gain access to potentially valuable external resources”

In this context universities can have multiple roles in regions:

- as creators of knowledge;
- as knowledge reservoirs;
- as knowledge antenna;
- as human capital creators;
- as transferors and commercialisers of knowledge;
- as regional leaders;
- as influencers of the image and identity of regions
- as connectors to local civil society.

This perspective suggests that models of the entrepreneurial university engaged in government supported triple helix partnerships with business needs to be broadened to embrace engagement with society. This can be referred to as a civic university participating in quadruple helix partnerships that embrace citizens as well as businesses and government. In such partnerships new modes of co-production of knowledge (mode 2) that are transdisciplinary, heterogeneous, reflexive and socially accountable are as important as traditional disciplinary and autonomous mode 1 knowledge production.

One approach to building this collaborative capacity is through diverse actors coming together in ‘quadruple helix’ partnerships to address Grand Challenges such as environmental change and demographic ageing that confront most regions. In a European policy context linking smart specialization and grand challenges is potentially one way of creating the elusive synergies between regional policy and research under Horizon 2020 given the challenge focus of the latter. Grand Challenges require:

- a ‘departure from neutrality’ in establishing policy and programme priorities;
- long-term and ‘open ended missions’ concerning the socio-economic system as a whole, inducing or requiring system and institutional transformation;
- multiple objectives, addressing not merely the economic but also social and environmental concerns ;
- complex, interlinked, global and local processes requiring multi-level action and coalitions; more transdisciplinary R&I;
- closer working between different parts of the public and private sector and enhanced public – private partnerships;
- a key role for ‘stakeholders’, ‘users’ and ‘co-producers’ of knowledge .

Within the EU such an approach chimes with adoption of principles of Open Innovation and the cross cutting theme in Horizon 2020 of Responsible Research and Innovation (RRI) and ideas of the city as a ‘living laboratory’ for testing new ways of working. RRI has been defined in the Rome Declaration (2015) in the following terms:

Responsible Research and innovation deliver on the promise of smart, inclusive and sustainable solutions to our societal challenges; it engages new perspectives, new innovators and new talent from across our diverse European society, allowing to identify solutions which would otherwise go unnoticed; it builds trust between citizens, and public and private institutions in supporting research and innovation; and it reassures society about embracing innovative products and services; it assesses the risks and the way these risks should be managed

However there can be tensions between this approach and that which characterizes smart specialization strategy formulation (S3). Ubiquitous Grand Challenges (GC) by definition are complex, broad and multi-dimensional and require generic solutions and new competencies whereas S3 focuses on sharpening current specialisms. S3 has a short term business output focus and seeks local competitive advantage whilst GCs seek long term socio-economic outcomes. Nevertheless a possible reconciliation of these tensions may be found in the common adoption of principles of open and social innovation into smart specialisation and a greater emphasis on building collaborative institutional structures within regions. In this regard the quadruple helix is a valuable bridging concept between the two approaches. It can be a particularly effective way of mobilizing the academic community to work with business and the community

A good example of such processes at work can be found in Newcastle as the regional capital of North East of England. Here the city has built on academic and clinical strengths in the field of ageing science to address the challenge and opportunities of an ageing population by building quadruple helix (QH) partnerships. Key QH actors have established the ageing agenda locally, ensuring institutional buy-in and configuring national policy to prompt local actors to sustain a commitment. There is a long partnerships between researchers and civil society organizations, notably an Elders Council and a 3,000 member citizen user panel V.O.I.C.E North (Valuing Our Intellectual Capital and Experience) and strategic sites (Campus for Ageing and Vitality) where collaboration can take place. The panel has engaged older members of the public in research in order to produce well-being effects. It has supported research translation and helped business innovate, through creating a better understanding of what older users and consumers require and allowed SMEs and academics to engage with a pool of older people to whom they would not otherwise have had access. Most importantly it has provided a sustained network of participants with a deeper understanding of the research and innovation process as ‘research-savvy citizens’.

This approach has informed quadruple helix collaborations around shaping the future of the city region as an age friendly city. It has been linked to the Government Chief Scientist’s Foresight City Futures initiative and identified a scenario of Newcastle as a ‘test-bed city’ that can attract investors to trial new products and services and new ways of working.ⁱⁱ This local platform has enabled Newcastle University to establish the Government’s new National Centre for Ageing Science and Innovation. The Newcastle experience suggests that sustained engagement over a long time is necessary in order to effect the policies and strategies of organisations at multiple levels and to ensure that they are not led away from the challenge agendas, as core priorities (e.g. narrowly defined research excellence in universities and the day to day care of the elderly by local authorities) assert themselves under the pressures of everyday institutional demands.

In summary the EU experience suggests that a place innovation strategy should not take the form of a one size fits all approach, not least in terms of expecting knowledge generation from research to produce downstream local innovation. This is particularly the case in lagging regions lacking current absorptive capacity in local businesses and collaborative and leadership capacity. Rather the priority should be to invest long term in building this institutional capacity. In this regard cities, small and large, as institutional hubs and meaningful ‘places’ are of critical importance.

Implications of EU experience for UK policy

The European Structural and Investment Funds which support smart specialisation cover a wide range of measure than can address the barriers to innovation in lagging cities and their regions. The mantra of ‘smart, sustainable and inclusive growth’ reflects a broader concern with sustainable development compared with other investment programmes, which are often focused on immediate *outputs* in terms of jobs and growth. While the longer-term approach to *outcomes* in addressing the challenge of sustainable development may work more slowly at first, taking time to build better projects can pay off in the end. The stronger focus on inclusion also fits with the Government’s new attention to ‘places left behind’. Indeed a shift in balance between ‘investing in success’ to ‘tackling underperformance’ is appropriate and timely – especially in terms of coping with the inevitable economic shocks BREXIT negotiations will engender. This must involve spreading the agglomeration economies of the ‘powerhouse’ cities to smaller cities in their hinterland

Most of these places do have some assets of international quality, where universities are key. These can be built upon, for example through embedded science and business parks and linked skills development programmes. The Advanced Manufacturing Research Centre linked to Sheffield University but based in more deprived Rotherham is a good example, combining leading edge research with global companies, support for SMEs in the steel sector and modern apprenticeships for individuals from deprived neighbourhoods. Equally important is the valorisation of cultural and heritage assets through the endeavours of university arts and humanities departments. This can feed into the development of distinctive (specialised) local cultural economies supported by the rapidly developing digital sectors found in many smaller cities outside of London.

Central to this approach is the need to link regeneration policies with their focus on ‘place making’ with territorially sensitive innovation policies. Universities as key urban anchor institutions with a clear physical footprint in cities, can help bridge the long established gap in the UK between industrial and urban policy by providing a placed based dimension to the former. Many cities, large and small, have benefitted from major investments in university campuses with the campus being ‘opened out’ to the city and wider region. Going forward there is a growing recognition that innovation requires regular contact between researchers, students and business and this can be helped by premises where relationships can be forged. It also needs institutional mechanisms to facilitate collaborative work, possibly through a special purpose vehicle. As part of urban regeneration schemes such sites can be a test bed for new technologies.

But for systematic innovation the sites need to be an integral component of a local industrial and strategy. Such strategies must recognise the importance of changing the way the city works so as to meet global challenges such as environmental sustainability and demographic ageing. In relation to the former, plans for local energy production, distribution and security, for decarbonisation, for flood management and for the green economy are all opportunities. Likewise how the city and its public services are organised across a wide range of activities to meet the needs of an ageing population are opportunities for social innovation. In both instances the innovation ecosystem should combine functional and spatial systems. While this may be a tall order for a large and complex city it is a more realistic possibility for the smaller cities with a university in the north of England possibly working with a major core city and its universities.

The investment planning process

Notwithstanding some of the shortcomings in the current process in many respects the ESIF partnership approach could provide a template for creating such ecosystems. Universities as long established, autonomous public bodies could play key role in shaping and participating in investment planning. Such an approach would have the following features:

- a seven-year period moving away from standalone projects towards more strategic programmes;
- fixed and transparent quantitative criteria determining funding allocations, preferable to an annual 'discussion' which is often opaque ;
- much less rush to get money spent, often regardless of quality, before artificial target dates;
- final decisions resting with departments of central Government, but with rules that support local groupings within an open dialogue;
- decisions not taken by meetings of single bodies closed to the public;
- a read across to the skills agenda ;
- freedom to work across administrative boundaries (for example in recognition of labour market areas)
- a move away from basic grants towards a wider mix, which includes loans and equity stakes.

The shift of investment finance from standalone projects developed with shorter term perspectives by individual institutions towards more strategic programmes led by local partnerships over a much longer 'mortgage length' perspective, means it may be appropriate to think of the different funding sources as working together, albeit accounted for separately. This could embrace funds awarded to universities for research. Greater devolution and more decentralised fiscal policy in the form of business rates further strengthens the case for new and robust collaborative partnerships. If universities are going to be key actors as place makers they will need stronger connections to combined and local authorities not least because of the latter's land holdings and planning powers and ability to lever cheap capital finance, especially if it can be secured against localised business rates **and** university research and teaching income. Local NHS institutions are obvious additional partners given the radical transformation of the health service infrastructure underway and the fact that many hospital trusts have deep relations with universities and teaching hospitals are sometimes located alongside university campuses. Universities, combined or local authorities, and local NHS institutions as major land- holding anchor institutions have a strategic and financial interest in setting out a collective and strategic vision of how these new forms of funding can be best designed, and how longer term returns can be reinvested to support innovation on an ongoing basis. Each therefore needs to build its individual and collective efforts to drive and benefit from local growth.

The challenge ahead

The innovation audits are a long way from the agenda that has been outlined. They have not been predicated on any particular geography and those already signed off transcend the boundaries of LEPs and Mayoral authorities in a sensible recognition of the need to build critical mass. But the consequence of this has been the loss of place identity and the link to local labour markets. In contrast the Northern Powerhouse prospectus has endorsed a proposal from the N8 group of research universities for an urban focus and a "network of Urban Transformation Centres to

translate research excellence into direct action". This approach resonates with that adopted in RCUK's Urban Living Partnerships but where this leaves other universities and places in the North remains to be seen.

To complement the innovation audits and build on the lessons from smart specialisation this paper has suggested that policies to enhance the role of universities as anchor institutions in left behind city regions could be an important component of a place based innovation strategy. However some institutions wishing to play this role face a challenging environment. A 2016 P.A Consulting survey of university leaders views on 'the unsettled outlook for higher education' suggests that 43% of VCs think that it is 'very or somewhat likely' there will be as significant number of institutional failures and 76% predicted 'rationalisation of provision through consolidation, transfers and course closures'. Whilst complete closure is unlikely the downgrading of autonomous institutions to branch campuses could have the same negative effect in terms of the place making role of the institution as takeovers in the private sector.

Of course these are only opinions but HEFCE analysis of HESA data does suggest a widening financial gap between the best and weakest performing institutions. An independent published paper in the Cambridge Journal of Regions, Economy and Society suggests that some vulnerable institutions can be found in vulnerable places where universities are key anchor institutions.ⁱⁱⁱ The threats arise from the turbulent higher education environment within which universities are now having to operate include:

- the removal of the student number cap;
- the loss of fees from non- UK students flowing from visa restrictions
- the privileging of elite institutions in both regards
- teaching evaluation influenced by lower graduate earnings by locally recruited students from disadvantaged backgrounds who are employed in less dynamic local labour markets
- the possibility of new entrants into the HE market place cream skimming profitable programmes that cross subsidize STEM subjects important for local innovation ecosystems.

Conclusion

To counter these possible threats a place based innovation strategy needs mechanisms to support the development of the anchoring role of universities in the more disadvantaged city regions of England. However, the initiatives and funding streams announced in the Autumn Statement and related documents suggest that the Treasury's focus remains with upstream investment in leading edge science and technology in top universities. It is far from clear how this linear science and technology push model will result in downstream innovation that could also help behind left behind places – the areas which seem to be the concern of the Prime Minister. Indeed the innovative potential of different places seem to be ignored in the Autumn Statement's reference to the new Industrial Strategy Fund which highlights technologies where the UK has 'proven scientific strength'. The Statement is silent on the barriers to the uptake of these technologies and the need to achieve higher levels of innovation in local economies in order to raise productivity across the whole country.

The Green Paper on the industrial strategy could be an opportunity to introduce new thinking about a territorial dimension to industrial policy which could incorporate a strong innovation ecosystem

strand. This would involve government support for building institutional capacity for so called ‘quadruple helix’ collaborative partnerships between all universities and further education colleges in an area, business, local and central government and the voluntary and community sectors. Such broadly based partnerships should recognise the changing nature of innovation including open and social innovation and the importance of co-production of knowledge between researchers and local users. The various actors would need to work together to unlock local business and community potential for innovation broadly defined and address the barriers to realising that potential. The focus could be on innovations that might contribute to addressing grand challenges, such as ageing and sustainability, that are local but have a potentially global market place for goods and services and where the ‘place’ can be a test bed or living laboratory. In going down this route most places should not aim to be at the leading edge in the development of new technologies or to become a Cambridge ‘look alike’.

As local ‘anchor institutions’ universities should be key actors in building this collaborative capacity. Some will need to step up to the plate and deliver ‘responsible research and innovation’ and in the process meeting the same obligation to serve civil society locally along the lines that the Prime Minister has suggested to the private sector. This would involve a university or universities in a particular city region taking on a ‘convening’ or ‘facilitating’ role in the formation of a local innovation ecosystem or ‘knowledge hub’ working in partnerships with LEPs and local/combined authorities. Key tasks would be to: identify unique local assets and potential business clusters through shaping ‘smart specialisation’ strategies and Foresight exercises; addressing the skills gaps inhibiting innovation; fostering the take up of platform technologies; providing global-local linkages for SMEs and attracting inward investors to use the ‘laboratory’. This endeavour would need to be underpinned by long term co-investment by universities and public authorities in physical ‘place making’ infrastructure that can generate returns to finance the capacity building activity of the partnerships.

Immediate action points

4. Building upon the science and innovation audits BEIS and HEFCE identify a lagging city region and its universities, LEPs and local local/combined authority with unrealised innovation potential willing and able to pilot the approach set out in this paper. This may involve linking a northern powerhouse city/university with a smaller city and post 92 university in its hinterland
5. Creating central capacity, possibly building on an entity like the smart specialisation hub, to support the pilot and develop mechanisms for connecting this bottom up approach to the evolving top down national industrial strategy including facilitating cross city region collaborative programmes, links to Catapult centres and to national innovation centres located in but not connected to their host city region
6. Monitoring the possible impacts of the Higher Education Bill on the capacity of universities to perform an anchor role lagging city regions

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ⁱ <http://www.cardiff.ac.uk/research/explore/find-a-project/view/461391-smart-specialisation-for-regional-innovation-smartspec>

ⁱⁱ <http://www.newcastlecityfutures.org/>

ⁱⁱⁱ <http://cjres.oxfordjournals.org/content/7/2/307.abstract>