Innovation districts

How cities speed up the circulation of ideas

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A paradox of the contemporary knowledge economy is that it is both dispersed and concentrated. Technologies make it possible to organise activity anywhere on the planet. Yet the most advanced knowledge-based industries cluster together, primarily in small areas of big cities.

They do so because citiesare accelerators. Their growth depends on their ability to speed up the velocity of circulation of ideas, people and money. This is one of the unique things

that cities do, and it's why the size of cities roughly correlates with productivity (a doubling of size leads on average to productivity growth of 2-5%). Clever cities learn how to support circulation, interaction and combination – not just through random interaction but also through institutions and places that help orchestrate, curate and channel creative combination in useful ways.

Over the last 30 years many cities have focused on growing dynamic and intensive innovation districts as an alternative to the out-of-town science parks that dominated in previous decades. Many nations and cities now want more of these kinds of cluster, hoping for a knock-on effect in terms of jobs and prosperity. But how should they cultivate them? And what has been learned about how to make them work?

In this piece I offer **three main observations**:

First, construction needs to be matched by curation. Innovation districts depend on a sense of place, often working best in 19th century buildings, with streets not towers, bricks more than concrete, flexible spaces rather than overdetermined ones, character rather than conformity. But buildings are not enough, and I argue that the planners and developers of clusters of this kind prioritise physical development too much and need to also understand them as a kind of collective intelligence, and one that is highly dependent on relationships. Run well they ensure sharing of data, insight, ideas, creativity between large numbers of people, firms, universities and other institutions, using both online and offline links, formal and informal connections.

Second, land is capturing too much of the value of innovative districts. As clusters succeed they tend to give large capital windfalls to landowners many of whom have contributed little to the wealth they capture. Economic theory frowns on windfalls of this kind and encourages policy-makers to come up with smart ways of recycling them. Yet no major cities are doing so, and none are recycling money into future creativity (for example giving young children experience of innovation and invention, which evidence suggests is a better way to fuel future prosperity than tax breaks and subsidies). What is needed is a new

approach to capturing the land value gains within cities resulting from the knowledge-based economy and recycling these into sources of future intangible growth.

Finally, because districts are often caught up in self-promotion there has been little interest in more rigorous attention to evidence, or critical analysis of the value they create, or how best to organise tools such as accelerators and testbeds, or how to design physical spaces to maximise their impact. A more honest, and experimental approach, with pooling of evidence and experience, would pay big dividends.

This piece builds on the previous work Nesta has carried out on the geography of economic activity, exploring the importance of local conditions and place-based innovation; our work on some of the building blocks such as accelerators and labs, as well as past work on the need for spaces for innovation (and how these should be designed), on the spread of innovation, and indices to map ecosystems such as the digital entrepreneurship cities index.
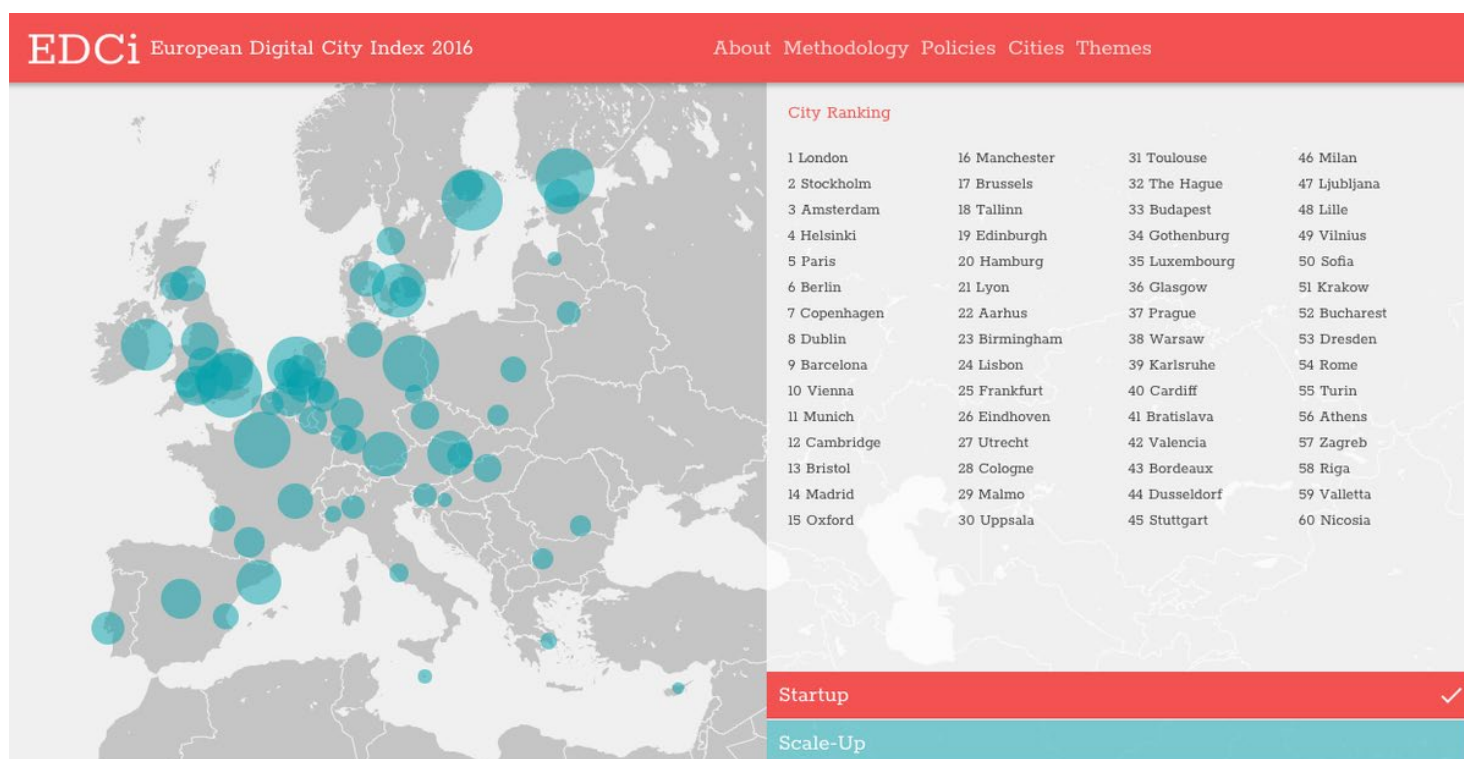
The promise of clusters and districts

The clustering of economic activity has been a topic of conversation at least since the 19th

century when [Alfred Marshall](#) first offered a serious theoretical analysis of business clusters, which [he termed](#) 'industrial districts': concentrations of specialised industries in particular localities. In the last quarter of the 20th century many other authors developed these insights – from Charles Sabel and Giacomo Becattini to Peter Hall. Hall's analysis of creative cities throughout history, and the role of particular milieux, remains unmatched in its sophistication. Michael Porter later successfully [popularised](#) and commercialised some of these ideas, though losing much of the nuance.

These districts bring together deep pools of skilled labour; many firms; colleges, academies and universities; industry associations and clubs that together ensure that ideas and knowledge circulate and grow.

Some of the world's successful clusters are very well known – the City of London in finance, Hollywood in film, and Silicon Valley for tech. These exemplify the striking pattern that even as communications technologies have evolved, the industries linked to them have become ever more concentrated. [Nesta's Creative Nation](#) research showed, for example, that in the UK "53 per cent of employment and 44 per cent of businesses are found in the top five locations (the equivalent percentages in other sectors are 32 per cent and 30 per cent respectively)".

The [Brookings Institution](#)'s Julie Wagner and Bruce Katz have studied the new urban models of clustering, and in particular [how innovation districts](#) in cities now cluster and connect small firms, start-ups, business incubators and accelerators, offering an alternative to the out-of-town science parks that were so popular from the 1960s onwards. Some of these urban districts rely on 'anchor institutions' – the universities, research bodies, and knowledge-intensive businesses located at the centre of innovation districts (both figuratively and literally) that often play an active role in [creating](#) new districts. MaRS in Toronto is a good example – linking the university, province, accelerators and venture capital, and contributing to the region's huge success in recent years in creating technology jobs (more since 2017 than Silicon Valley, Seattle and Boston combined according to [one survey](#)). A well-known example of an innovation district that directly benefits from a physical

anchor institution is Kendall Square in Cambridge, Massachusetts. Dubbed 'the most innovative square mile on the planet', the district is surrounded by the Massachusetts Institute of Technology (MIT) campus and has been able to leverage the resources of the university to help attract and grow dozens of technology and life sciences companies.

There are many other examples: 22@Barcelona, launched in the early 2000s, is often hailed as one of the first modern innovation districts. Thanks to the presence of cutting edge companies, universities and training centres, and Barcelona's successful promotion of itself in fields such as mobile and data, it has now become one of Spain's most successful urban renewal projects, and is spawning interesting spin-offs in neighbouring areas. China has developed many districts of this kind, from Shanghai to Chengdu, and Shenzen is now one of the most successful anywhere, with very distinct approaches to investment and rapid knowledge sharing that fuel a clutch of new corporate titans like Huawei and Tencent.

Today, innovation districts and clusters can be found across the globe in cities as diverse as Paris, Buenos Aires, and Montréal – with ambitious projects continuing to be launched in places like Singapore. Increasingly, smaller cities without institutions in the league of MIT or Cambridge, are also managing to foster successful districts; Chattanooga, Tennessee and Fort Worth, Texas are just two less known US examples (for a full list see this slidedeck).

Some surprising places have done particularly well in fostering innovation districts: the district built around an anchor institution – Ruta N – in Medellin in Colombia is a stand-out example of their place in broader strategies of urban reinvention.

Applying social network analysis to innovation districts research

Accompanying the rise of innovation districts is a growing shelf of reports, handbooks and toolkits that attempt to provide policymakers with a blueprint for creating a thriving district. There is also a growing academic literature on ecosystems. But despite this research, it remains hard to discern why some districts work and others don't.

We know they are very hard to plan or create from scratch and that they only make sense as part of the dynamics of a bigger city or regional economy.

Many analyses emphasise obvious factors such as big universities and companies that have access to capital; an existing competitive advantage; a skilled workforce; the 'right' culture; and other physical assets – everything from public transport to broadband connectivity. Most emphasise how they build on existing advantages (and show why efforts to create districts in areas without any pre-existing infrastructure usually fail, including many examples in [biotechnology](#) and the dozens of failed attempts to mimic Silicon Valley). In some cases they emphasise the role of venture capital – not just because it provides finance but also because it provides the best new firms with access to specialist expertise and mentoring.

But these analyses don't really explain the surprises and they can imply a mechanical relationship between causes and outcomes. There has been little rigorous analysis on how districts effect the overall success or failure of the surrounding city – or why some achieve spillovers and trickle down while others don't. The lack of clear insights may explain why so much of the practice focuses on physical property development – since at least that can be planned.

The character of physical spaces does of course influence how innovation happens. It's striking that many of the most successful districts use 19th century buildings which often turn out to be more flexible than 20th century ones, as well as encouraging conviviality and active street-life. These tend to look much more alive than an earlier generation of science parks, with a faster velocity of circulation of information and ideas, cafes, bars and restaurants, meet-ups and events.

But the assumption that having the right physical infrastructure in place is the key to creating a successful innovation district – with a culture of idea-sharing and rich social networks being side products – may be wrong. The alternative model builds on emerging

ecosystems, curates the key linkages, and flows, and then grows a physical infrastructure around them. This is roughly what London's Tech City did, as documented in a recent study. It grew faster *before* the Cameron government decided to back it, than after, but that backing did help it to consolidate and become denser, even in the absence of anchor institutions and any coherent plan for physical infrastructures and buildings (plenty of building did take place – but adhoc rather than planned).

Novel data science methods are increasingly revealing that the social networks and relational interactions between people are what really matter – Antoine van Agtmael provides a good overview of how these factors are key for understanding the rise of what he calls the new 'brainbelts' of America and Europe (and these provide good answers to some of the place-based dilemmas identified by Brookings).

A recent social network analysis project by Neighbourlytics shows that it is the presence of a high density of people, dispersed across multiple clusters of (mainly public) places that characterises the truly innovative neighbourhoods of Amsterdam, Barcelona, and Buenos Aires, among others. The World Economic Forum has also pointed out that the social dimension is the "glue" of innovation systems and at Nesta we have previously reached similar conclusions.

Visualisation showing Buenos Aires Entrepreneurship ecosystem

View the full-size image on the Word Economic Forum website

Legend:
- High-impact entrepreneur
- Networks
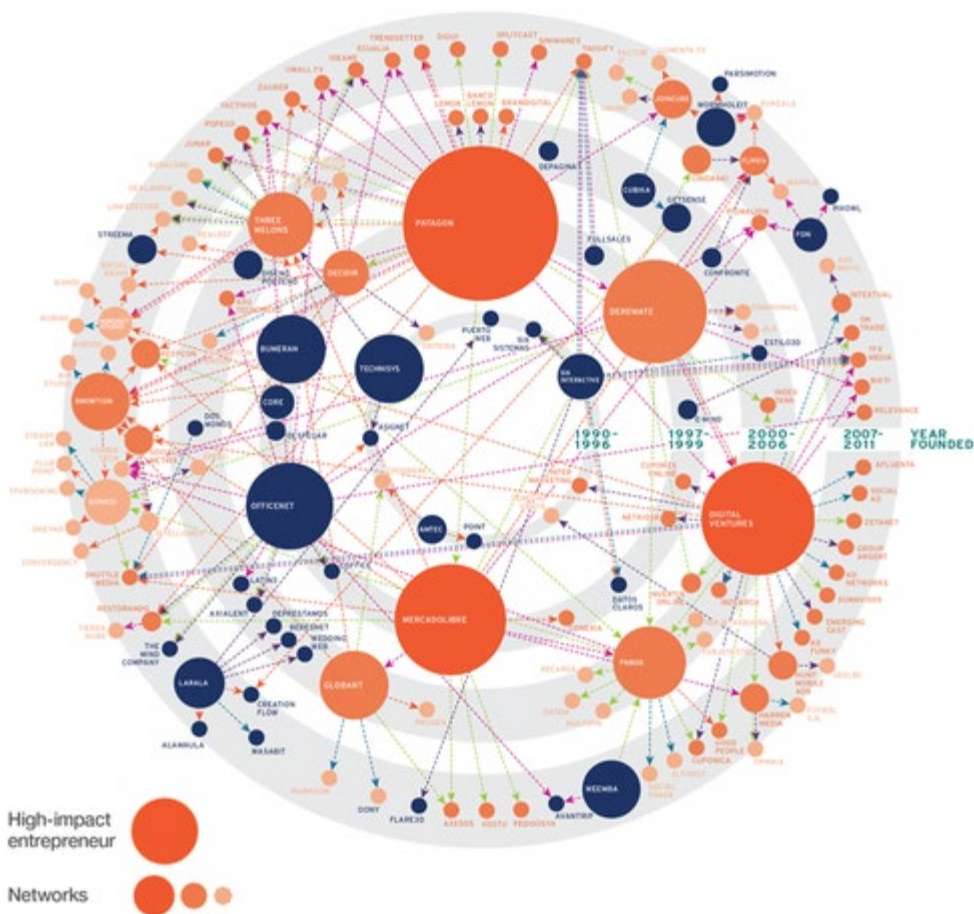
Consistent with the qualitative research to date on innovation diffusion, this evidence encourages us to view successful innovation districts as ecosystems of activity that thrive because of dense social interaction and networks spread across various hotspots of activity. Ed Glaeser, the Harvard professor of cities, perhaps summarised it best when he said, "we are a social species that gets smarter by being around other smart people".

While anchor institutions and new buildings can be important, a variety of types of space can facilitate interaction within the same district, from cafes and bars to parks. A useful analogy is big conferences; where the fringe events are often the spaces where the really fascinating conversations take place and the meaningful exchanges occur.

Incubators and accelerators also play an important role. As our many studies of accelerators show, their intensive approach to cohorts can greatly improve survival rates, as well as having spillover effects on the rest of the ecosystem.

Below: MIT Entrepreneurial ecosystem showing hotspots of activity. Source: Guzman & Stern. Illustration by RJ Andrews. View the original visualisation on the <u>Scott Stern</u> website.
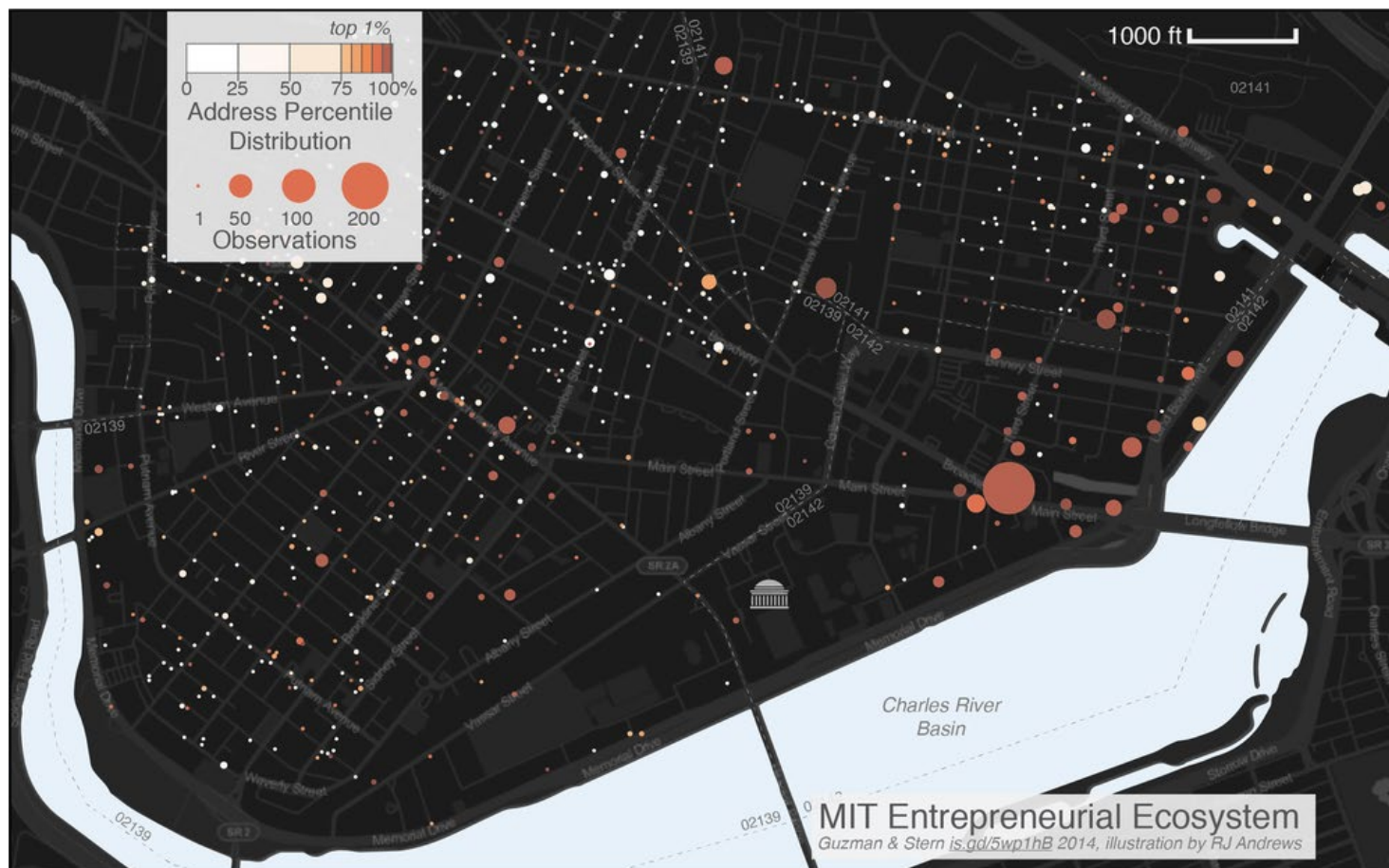
MIT Entrepreneurial ecosystem showing hotspots of activity

Drawing on these insights, we would encourage developers and city leaders to make the curation of networks and social interactions a much more prominent part of plans for innovation districts of all kinds – ensuring that new districts are built not just around shiny buildings but also around a rich culture of insight and idea-sharing.

To help achieve this, new <u>innovation mapping tools</u> are being created which better depict the networks and patterns of interaction in innovation districts – so that planners know early on where the hotspots of activity are and where to allocate resources.

At Nesta we have already shown what is possible. For example, working in collaboration with the Welsh Government, we created <u>Arloesiadur</u> (Welsh for *innovation directory*) to

measure and visualise Wales' industry, research and tech networks with the goal of informing policies that drive growth. Arloesiadur is a collection of interactive data visualisations and open datasets that can be used to answer the big questions about industrial and research strengths, collaboration networks and future economic opportunities.


Interactive visualisation of the connections between tech communities in Wales and other parts of the UK

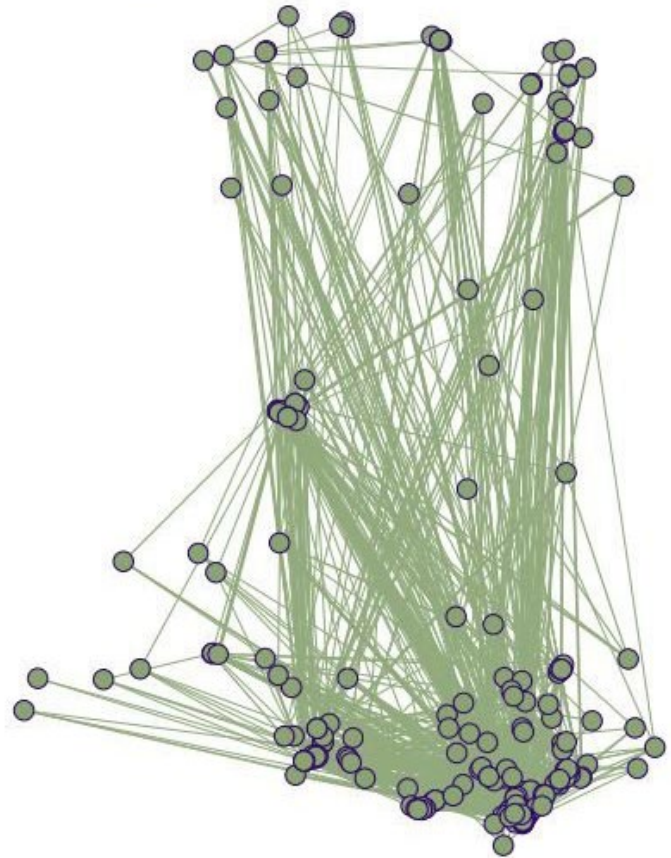View the full-size version on Arloesiadur website

Crucially they make it possible to recommend links that don't exist but should exist – helping the network to function more effectively. Others should now do the same, developing new tools using data science methods to better understand and nurture their local innovation ecosystems.
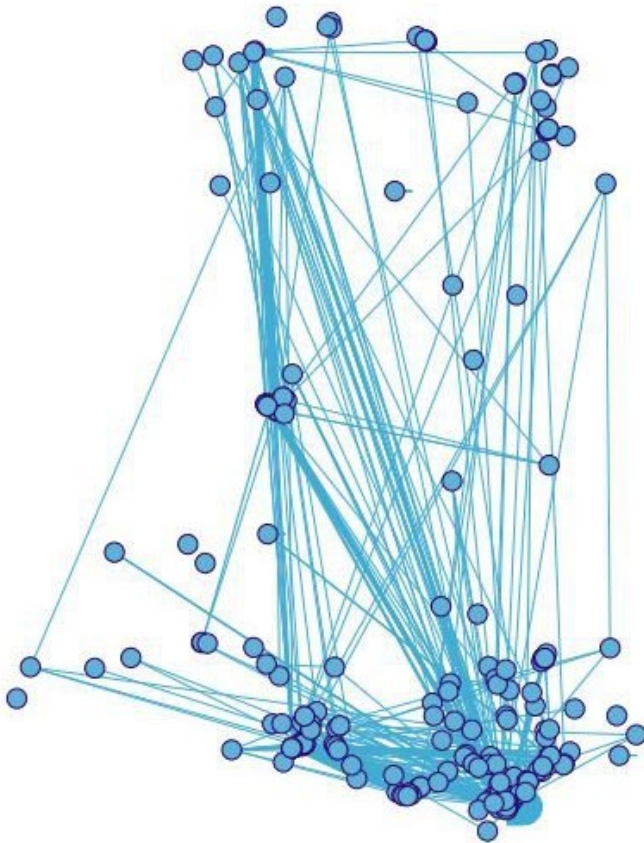
This network visualisation shows research collaborations networks in Wales based on Gateway to Research data. The image on the left shows the actual network as it exists in the collaboration data. Each node is an organisation, each tie is a collaboration. The position of the nodes represents the geographical position of an organisation.

The network in the right shows the same information, except that the ties are based on a recommendation engine that we developed which takes into account an organisation's past collaboration record. Since the network ignores an organisation's location when making a recommendation, it tends to suggest connections with organisations further afield geographically, potentially making the whole system better connected.

The innovation systems that are, and the innovation systems that could be

All of this points to a future where innovation districts are better understood as a kind of collective intelligence. As my book Big Mind, and the more recent work of Nesta's [Centre for Collective Intelligence Design](#) have shown, any system can be understood in terms of cognition: how well does it observe, analyse, create and remember. These can be organised well or badly; with shared information and ideas or separated. An emerging premise is that the best functioning innovation districts are ones that are more like a true collective intelligence, with rapid shared learning (for example in response to new

technological breakthroughs or shocks), helped by active flows of information, people and money.

This has also been the consistent finding of research on [the key value universities provide](#) to business and clusters. Rather than this being primarily embodied in linear flows of IP from researchers in universities to startups or existing firms, this value is much better understood as a kind of collective intelligence – providing knowledge, relationships, ideas rather than the classic technology transfer model. But more detailed analysis of how districts perform as collective intelligences would be useful: how much do they depend on active brokering? What is the role of formal, semi-formal and informal meetings? How different are the patterns in different sectors?
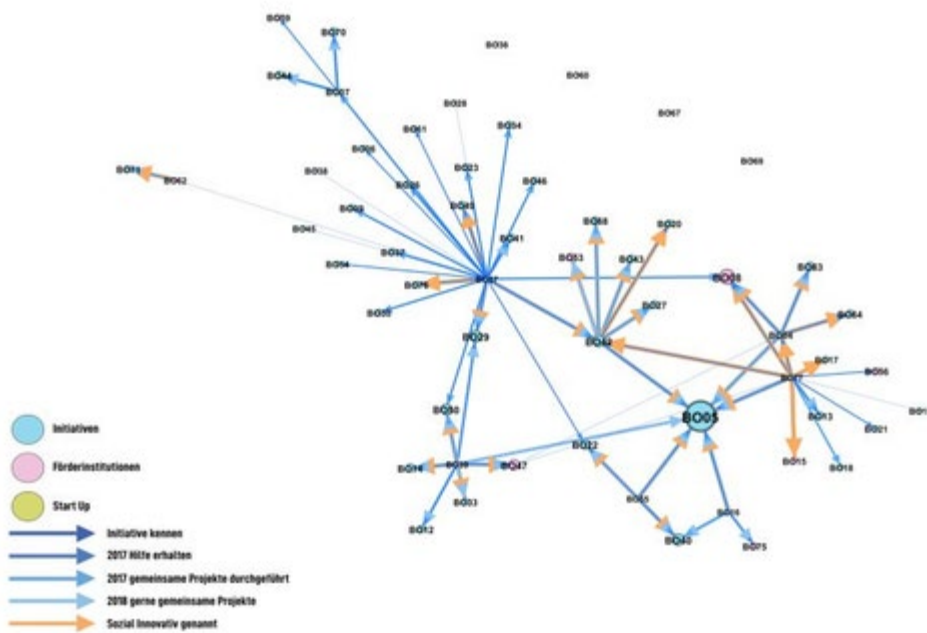
Similar questions arise from the analyses that are beginning to be done on social innovation ecosystems, such as this [study of networks around Dortmund in Germany](#):

Visualisation of the networks around Dortmund in Germany

[View the full-size image on the Soziale Innovation im Ruhrgebiet website](#)

Nesta's recent study of [digital social innovation](#) in Europe also represents a big step forward in more rigorous measurement which can then also be used as a diagnostic tool:

Explore how well different European cities perform on the EDSII by zooming in, panning around and selecting individual cities through the ranking list, map or bars.

Windfall gains and fair taxes

As economies continue to become more knowledge-based and produce more intangible goods, economic activity also becomes more physically concentrated – especially in major cities. This is because the most knowledge-intensive industries, such as finance, design, fashion and computer software, benefit from agglomeration; they value proximity and are willing to pay a high price to be close to other firms. An example is the clustering of advertising firms in lower Manhattan; an area which alone accounts for 24% of advertising agency receipts in the U.S. Concentration also has strong productivity effects, as recently analysed by Enrico Moretti. More generally innovation is increasingly concentrated in relatively few places.

The result of this paradox is that whenever innovation districts and clusters take off, they

give large capital windfalls to landowners – many of whom have contributed little to the wealth they capture. In London, for example, some of the biggest beneficiaries of the last 20 years of innovation and economic growth have been the Crown, the Church and a number of aristocratic estates. Next to several newer estates, and wealthy offshore investors (who are buying up large swathes of the capital), these estates gain millions of pounds in economic rents and spillovers each year. But most of the wealth of these landowners simply derives from their luck in inheriting acres of land in one of the world's most lucrative property markets (the property portfolio of Oxford and Cambridge university colleges means that are also beneficiaries). The Duke of Westminster alone owns more land than the queen.

In Silicon Valley there is a similar pattern. One (private) estimate suggested that 40c out of every $1 invested by venture capital leaks out to landlords. Another recent estimate showed that a large proportion of capital accumulation in the contemporary US essentially involves land and property.

Economic theory dislikes windfalls which tend to drain resources away from productive activities, and economists encourage policymakers to come up with smart ways of recycling value. Yet no major cities are using land taxes or charges in this way. Fear of tech companies going elsewhere seems to be a key reason, particularly in the U.S – where cities instead use tax *breaks* to incentivise companies to stay. But this lack of action is also a symptom of the remarkable political clout of property owners and developers.

The simple solution to this problem is a land value tax — which the political economist Henry George already advocated in the 19th century and has long been advocated as a way to capture and share the benefits of city growth (from Ebenezer Howard to Glen Weyl) — or a tax on land value gains.

Such taxes would seem to be especially appropriate for innovation districts given that they are intimately place-bound. A more focused land tax would also be more politically feasible than one that hit every home-owner and small business, even if from a policy point of view it

would be better to capture the windfalls that also accrue to residential land in the wider city (and materialise through the salaries of workers spent on rents or home ownership).

The ethical or distributive argument for land taxes is straightforward: making landowners pay for the benefits which location happens to grant them. Commentators across the political spectrum in both [The Guardian](#) and [The Economist](#) have repeatedly endorsed the idea (Milton Friedman is even [quoted](#) to have called it "the least bad tax").

Opponents argue that the '[value](#)' of land is different everywhere and hard to tax on a national level. Landowners protest that any land tax would discourage investment behaviour, stymying an important source of economic growth. Similar criticisms are also levelled at [tax increment financing](#) (TIF): an alternative approach to public financing that has been pioneered in the U.S. TIF tries to reinvest tax gains from regeneration projects back into local infrastructure and economic development projects. But the mechanism still does not solve the problems of value capture – and it suffers from other disadvantages including a [lack of transparency](#), due to the way it avoids the public municipal budget process.

Yet it should be possible to measure the difference between the value generated from property development and the economic activity of tenants versus the land value effect in each city. This would allow local governments and municipalities to capture the land value created by innovation districts without disincentivising landowners and changing their investment behaviour.

In the UK, such a mechanism does already exist in a rudimentary form: the [Community Infrastructure Levy (CIL)](#). The planning charge came into force in 2010 and enables local authorities to levy physical development to generate money for infrastructure projects (last year the scheme raised billions). But the problem with CIL (which largely superseded [s106 agreements](#)) is that it is not suited to our new knowledge-driven economy. It is still based on a physical view of how a city works — levying new developments which create net additional floor space of 100 square meters or more.

What we need is a new intangible version of CIL: a framework that captures the land value gains within each city resulting from property development and the knowledge-based economy and recycles these into sources of future intangible growth. Measuring the land value effect in order to design such a framework may have proved technically difficult in the past, but advancements in urban economics and spatial analysis could now make it a reality. This should be a priority for national government, working in partnership with local authorities.

Academics working on [land-use planning](#) at the LSE have already managed to [value architectural amenities](#) by differentiating property prices and design quality within neighbourhoods. And researchers at the Bank of England have developed an expertise in housing market analytics and measuring the [time value of property](#).

We will shortly be making the case for creating new foundations in cities to act as spurs for future prosperity. More broadly we would argue for recycling funds into the sources of value — for example ensuring children have exposure to innovation and invention (as advocated by [this major study in the US](#) and [our work in the UK](#)).

Given the value of the knowledge-economy, the economic argument for creating such a framework is also high — at Nesta we have already measured the [creative economy](#) which alone was valued at over [£100 billion](#) in 2018.

Many critical policy questions still remain. How should you distribute the collected proceeds from a city land tax? When should the starting date of such a tax be? And how can you do so without reenforcing existing inequalities? But all of these questions are answerable — and it's neither wise nor fair for innovation districts to continue to leak quite so much value to largely passive landowners.

Conclusion - curation as well as construction

Many innovation districts have judged success primarily in terms of property values. As a result they are inevitably caught up in boosterism – hyping their achievements to pull in investors, firms and researchers. This is probably unavoidable.

But it has inhibited rigorous and honest assessment of what works and why, and it has tended to encourage replication of models because they are fashionable rather than because they are necessarily effective. We hope to encourage more fine-grained analysis and experiment – of the kind done by Nesta's [Innovation Growth Lab](#) – and to encourage more cities to prioritise curation rather than just construction.

Key strategic issues are being faced by many innovation districts:

- How to ensure spillovers and benefits for the rest of the city
- How to fit into broader economic strategies – that ideally align technology development with new job creation, and not just for the best educated
- How to prepare for economic downturns (which usually hit working spaces and incubators particularly hard)

To help answer these questions we need more experimentation and analysis, helped by the fact that it's now easier to map ecosystems than ever before; easier to curate and shape; and easier too to see which actions speed up the velocity of circulation of ideas and which leave them trapped behind walls.

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