

Strategic intelligence for the future of places

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Strategic intelligence for the future of places: enabling inclusive economic growth through the Opportunity Areas Analysis Tool

Fumi Kitagawa^a  and Matjaz Vidmar^b 

ABSTRACT

Based on the growing importance of *place*-based strategic intelligence, this article puts forward a conceptual framework for a new methodological approach to influence the shaping of subnational economic development. The novel Opportunity Areas Analysis Tool has been designed and deployed in the context of a City Region Deal in Scotland, UK. We define key trends, map core capabilities and assess exploitation capacities for data-driven innovation economic opportunities. We critically appraise the effectiveness of this approach for the creation of inclusive place-based future visions and narratives, and the alignment of technological opportunities within diverse geographical (e.g., semi-rural and rural) and sectoral conditions.

KEYWORDS

city-regions; local governments; data-driven innovation; multilevel governance; innovation intermediaries

JEL H7, O2, O3, R5

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INTRODUCTION

The intelligence about the territorial economic future sits across different institutional boundaries, where coordination is needed across cities, regions, sector by sector and between different agencies (Tewdwr-Jones & Goddard, 2014). Furthermore, a recent emphasis on ‘city-regions’ as a new emergent scale of policy and governance (Harrison, 2012; Waite & Bristow, 2019) requires strategic approaches to interact with multispatial levels of governance. With an increased interdependence of governments and non-governmental actors operating at different territorial levels, collecting and building spatial and sectoral intelligence means dealing with a significant level of complexity. Hence, there is a call for ‘developing strategic intelligence tools’ (Aranguren et al., 2019, p. 459) to help shape the strategic visions for the economic future of places.

Foresight approach has been developed and adopted as a series of tools and methods to build the evidence and intelligence for public policy and governance, particularly with an urban policy focus over the last decade (Ravetz & Miles, 2016; Dixon et al., 2018). However, future visioning of a *place* is constrained by a number of gaps


and barriers, including the fragmented nature of governance, arguably leading to the ‘problematic’ nature (Ravetz & Miles, 2016, p. 470) of the knowledge on the future of *places*. While the urban visioning has attracted policy and scholarly attention over the last decade, it appears that there exists a ‘strategic intelligence vacuum’ in ‘city-regions’ (Tewdwr-Jones & Goddard, 2014, p.779).


The relational nature of the networked form of economy and mismatch between geographical, institutional and political boundaries of local economy creates challenges for policymakers and practitioners (Boschma, 2004; Feldman & Lowe, 2017; Salder, 2021a). In terms of the ‘place-based industry policy,’ policymakers and practitioners are called upon to take strategic decisions on the basis of strengths, opportunities, threats and weaknesses of a particular ‘place’, while businesses and other actors may not be constrained by the geographical boundaries as they have different ‘embeddedness’ and ‘externalities’ (Salder, 2021b). Overall, the conditions that allow successful ‘place-based industrial strategies’ are not fully understood (Bailey et al., 2018; Beer et al., 2021).

In the light of these issues, this study presents an attempt to contribute to the calls for strategic and futures thinking to multiscale territorial economic development.

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Empirically, we provide insights from an ongoing intelligence building and policy roadmap creation in a city-region in Scotland. This includes a variety of policy, business and civic actors interacting across the emergent multilevel governance (MLG) policy structure and the 'inclusive growth' agenda of the City Region Deal. As a method development study, we use a mixed-method approach with a cross-case analysis and present the practical processes of deployment of the proposed Opportunity Area Assessment Tool (OAAT) for futures visioning. The two cases are set in two local authority areas within a city-region, including areas with substantial rural characteristics. Our aim is to demonstrate that OAAT can foster spatially relevant intelligence by creating a vision for the territorial economic future, which helps generate alignment across multiple levels of actors.

Theoretically, this study critically draws on evolutionary perspectives to territorial economic development. We conceptualize foresight as a process that creates alignment through narratives on 'alternatives paths' about the territorial development, governance and policy (Harrison, 2017, p. 57). The main objective of this article is to better understand the multiscale dynamics and strategic alignment across a diverse range of actors between geographical and sectoral boundaries (Vidmar, 2019). To do so, we critically appraise the proposed novel foresight tool, which has been developed and deployed to help identify emerging capabilities to realize 'opportunity spaces' (Grillitsch & Sotarauta, 2020). The article concludes by discussing the effectiveness and transferability of the proposed conceptual and analytical approaches to develop 'place-based' collective visions and narratives, and reflecting on the contesting nature of evidence required to develop a strategic common vision and decision-making in different geographical and sectoral contexts.

THEORETICAL APPROACHES: ALIGNING TECHNOLOGY, KNOWLEDGE AND VISIONS IN TERRITORIAL DEVELOPMENT

The development of foresight and roadmapping as a visioning tool has occurred in response to changing policy needs over the decades. One such change is an emphasis shifting from technology innovation to growing social dimension and user involvement (Georghiou et al., 2008), and another is a move towards more evidence-based policymaking (Feldman & Lowe, 2017; Gianelle et al., 2016). A widely accepted definition of foresight is: 'systematic, participatory, future-intelligence-gathering and medium-to-long-term vision-building process aimed at enabling present-day decisions and mobilizing joint actions' (Fabbri, 2016, p. 492). A successful foresight tool is expected to build 'capacity for social learning and collective intelligence, and anticipatory governance' (Ravetz & Miles, 2016, p. 469). The benefits of such 'spatially localised sharing, matching and learning' arguably tend to increase with 'uncertainty about the trajectory of technological change' (Kedron et al., 2020, p. 9).

In analysing the value of foresight in identifying future direction of multiscale territorial governance and policy-making, several institutional dimensions need to be highlighted. According to (Bache & Flinders, 2004, p. 3), 'multilevel' refers to the increased interdependence of governments operating at different territorial levels, and 'governance' signals the growing interdependence between governments and non-governmental actors making and enacting policy decisions at various territorial levels. The lack of strategic and institutional capacity of subnational actors in MLG structure has been examined in a variety of national policy contexts (Kolltveit & Askim, 2017; Okamuro et al., 2019; Perry & May, 2007). We should also note that the varied coordination of MLG policy and foresight practices includes a distinction between coordination across 'vertical' administrative levels and coordination across 'horizontal' level, with relationships defined by powers and resources distributed between the centre and local levels (Lyll & Tait, 2004). As more and more stakeholders are involved in the decision process of territorial development with multiscale governance structures, with heterogeneous and varied institutional forms, capacity and resources, there is growing complexity in negotiating decision-making powers between multiple levels (Pike et al., 2015).

Recognizing these issues in foresight and visioning in diverse territorial contexts, we note broader debates in local and regional economic development and policy. Public and private actors involved in territorial interactions are conditioned by a combination of different socio-political as well as territorial characteristics affecting their power as local agencies, set within the existing regional inequalities in what may be sometime characterized as persisting 'core-periphery structure' (McCann, 2016). Recent regional economic development literature highlights wider issues related to institutional arrangements and governance, with the need for 'participatory policy' and 'evidence-based thinking' in a more 'place-sensitive manner' (Kroll, 2015, p. 2095). On one hand, the advocates of 'place-based approaches' to economic development argue that it is necessary to fully consider the variety of local and regional factors in order to create development policies and intervention that will succeed in a particular area (Barca et al., 2012). On the other hand, against the background of recent 'place-based regional industrial strategy' (Bailey et al., 2018; Beer et al., 2021), the tension is noted between industry/sector-based and spatial elements of policymaking (McCann & Ortega-Argilés, 2015). In order to sustain competitive advantage locally, 'value capture strategies' (Beer et al., 2021) are needed, which will help break down barriers to knowledge flows through business networks.

Theoretically, evolutionary approaches in economic geography highlight the importance of learning and institutions as central determinants of change including 'knowledge formation, technological change' in the local and regional economic dynamics and growth (Beer et al., 2021; Kedron, 2020). This aligns with literature in innovation studies highlighting the relevance of the systems

of innovation, knowledge and technologies, networks of actors and the rules governing their interaction, that is, institutions (Malerba, 2005). Grillitsch and Sotarauta (2020, p. 704) advocate a concept of the 'region specific opportunity space', highlighting the interplay between path-dependent, structural forces and the growth of new paths through change agents. It is alleged that the emergence of a new territorial growth paths are possible only if an agent perceives new opportunities with certain technologies, and only if the agent has the 'capabilities to set actions towards the realization of these opportunities' (Grillitsch & Sotarauta, 2020, p. 716). It is argued that 'windows of opportunity' in places are more recognizable where the 'regime is less dominant and only weakly institutionalized or hybridized' (Boschma et al., 2017, p. 38). However, what constitutes the conditions that enable the agent to realize these opportunities, and the details of microlevel processes of 'how and where decisions were taken at the regional scale, or where events unfolded to create a new future' (Beer et al., 2021, p. 3) remain largely understudied.

Hence, we develop our analytical framework particularly focusing on the role of the strategic agency in territorial change, by referring to the concepts such as 'innovation intermediaries' (Howells, 2006; Katzy et al., 2013; Kerry & Danson, 2016; Vidmar, 2021) and 'innovation brokers' (Batterink et al., 2010; Sigler et al., 2021). The nature of such innovation intermediaries and brokerage varies: some can deploy targeted interventions to help develop systemic resources and catalyse innovation activities (Vidmar, 2020), while others act as brokers orchestrating innovation networks (Batterink et al., 2010). Sigler et al. (2021) observe the diversity of 'brokerage types' that city-region actors can play between global and local conditions and/or between other cities and regions. Such positionality and diversity of places need to be recognized and integrated as part of the place-based future visioning framework.

A growing expectation is given for certain local institutional actors and intermediaries to take a 'place-based leadership' role. According to Bentley et al. (2017, p. 5), 'place-based leadership' is considered to improve the capacity to 'generate future-oriented spatial visions as well as increasing the likelihood of realizing visions'. In particular, the role of universities in the context of urban visioning (Dixon et al., 2018; Tewdwr-Jones & Goddard, 2014) requires further scrutiny. Recent studies point out the roles 'civic universities' can play in a place making, by engaging in visioning the urban future through fostering networks across the public and private sectors (Tewdwr-Jones & Goddard, 2014; Vallance et al., 2019). As such, universities are often relied upon as facilitators of relationships or multilevel brokers, by identifying gaps in city intelligence and data gathering, and becoming more actively involved in city visioning processes in the so-called 'quadruple helix' (Leydesdorff, 2012) relationships, comprising business, academia, public bodies and community groups (Dixon et al., 2018).

Based on the review of literature, we observe two caveats in the foresight literature. First, it is noted that 'visions tend to reflect dominant power relations' (Dixon et al., 2018, p. 178). Second, there is a peculiar lack of consideration of the heterogeneous nature of interactions and connectivity between urban visioning and surrounding non-urban regions and wider city-regions in the MLG policy structure. Against such observation, empirically, a number of questions remains to be investigated at the micro level: What types of alignment of internal and external stakeholders' capabilities are required in such time- and agent-specific processes? What are the roles policies at different levels could play in the realization of such an alignment? More contextualized and critical understanding is required regarding a variety of actors and stakeholders, and their social and political capital to provide evidence and expertise to play a role in place-based visioning.

Designing the Opportunity Areas Analysis Tool (OAAT)

Opportunity scanning and the OAAT

Visioning tools such as foresight and roadmapping are used as policy instruments for anticipating development scenarios and enforcing governance strategies across a variety of stakeholders (Fabbri, 2016). This is more specifically related to a) the convergence of stakeholders on shared visions and roadmaps (Howlett, 2007), b) strategic planning and the strengthening of adequate critical masses on strategic areas of investments (Weigand et al., 2014), and c) the enforcement of regional innovation governance on a common strategic vision (Fabbri, 2016). In order to critically analyse spatially relevant conditions and processes for the realization of 'an opportunity space' in a MLG policy structure, we propose to develop a methodological approach to identify opportunity areas in a specific territorial context and build 'place-based' intelligence, which will aid in the visioning of the place.

We draw on the methodological scheme proposed by Fabbri (2016), which focuses on foresight as a tool for strategic planning and decision-making process, including the following five steps (Fabbri, 2016, p. 496): 'opportunity scanning'; 'foresight and roadmapping'; 'external expert assessment'; 'open thematic workshops'; 'preliminary version of the strategic document'; and 'final version of the strategic document and institutional validation'. These steps operationally reproduce the scheme of a succession of 'analysis (intelligence)', 'discussion' and 'validation' consisting decision-making process (Fabbri, 2016). In this study, we propose a new tool to unpack the very early stage of the 'analysis (intelligence)' phase, which would underline the continuing foresight exercises including the nature of the evidence to be collected. While the analytical discussion in this specific scope of this study focuses on the very early stage of opportunity scanning, the methodology itself also contains elements of all the other steps (Figure 1).

The tool aims to collate and assess evidence that can 'stimulate dialogue, help build a consensus on shared

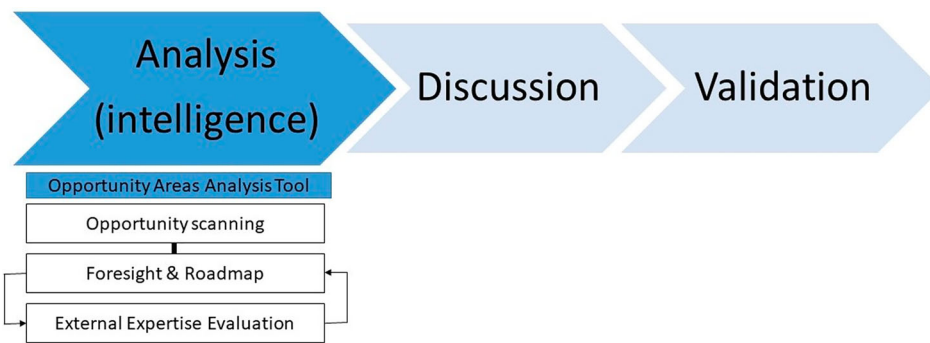


Figure 1. Conceptualization of the Opportunity Areas Analysis Tool (OAAT) in relation to the foresight framework drawing on Fabbri (2016, p. 497).

priorities' (Pérez-Soba et al., 2018, p. 776) among stakeholders in pursuit of emerging opportunity areas. In designing and implementing such a foresight framework, it is paramount to integrate critical questions related to 'equivalence' of the visions, and to incorporate 'reflectivity in research and practice' (Dixon et al., 2018, p. 795) at each of the steps.

Architecture of the OAAT

The conceptual starting point for OAAT is the framework to examine 'multilevel perspective' (MLP) on transitions (Geels, 2002) as a means to understand the interaction of actors, technology, and institutions (Geels, 2004). Such perspective proposes a view to examine change and transitions across three 'levels' of innovation: microlevel 'technological niches' of radical new solutions and development, meso-level 'socio-technical regimes', that is, interrelatedness of actors/stakeholders and their activities, and macrolevel changes in technical, social, economic and political 'landscapes' (Geels, 2005).¹ The temporal processes of path creation is underlined by 'interactions between economic, technical and institutional forces' (Geels, 2011, p. 29). One of the critiques of such perspective is a lack of analysis of 'agency' (Smith et al., 2005), though Geels (2011) argues that the agency is one of the key elements of such transition.

In designing the analytical framework of the OAAT, three key interrelated dimensions are identified drawing on the MLP framework: *Trends*, which constitute macro-level changes in 'landscape'; *Capabilities*, which correspond to the interrelationship of actors and their agency in the meso-level 'socio-technical regimes'; and *Capacities*, which represent 'technological niches' of innovative new solutions. The basic layout of the OAAT methodology is centred on sequential deployment of the three dimensions of analysis and interaction, each of which serves as the core criteria for data collection. Combined, the three dimensions act as a conceptual tool, which works on the principles of triangulation of the data, as summarized in Table 1.

Defining relevant trends. The first step in the deployment of the OAAT is the identification of 'trends.' In line with the approach adopted in Beer et al. (2021), this

should take into account a common denominator between the lead stakeholders' strategies and developmental priorities (political, societal and economic) as 'discourse'. In turn, these discourses should also be noted as contextual responses to key 'opportunities' from the society and local communities in particular, as well as interests of policymakers/global investors and networks of key actors. The evolving trends will ultimately culminate into a new 'landscape' (Geels, 2011). These dynamic relationships define the terms of reference or scope for the assessment of the place's core 'capabilities'.

Analysing stakeholder capabilities. In analysing 'capabilities', it is vital to map out the network of stakeholders and their economic activity and research and development (R&D) in the place related to the defined trends. The analysis includes organizational structures, physical infrastructures, research strengths, social capital, and other resources embedded in the place. A key target area for mapping is existing inter-institutional relationships and the interests of various actors (e.g., business/entrepreneur, community). The analysis should focus on providing an assessment of capabilities for developing and sustaining competitive advantage within the studied 'regime' or technological domain. To connect this with the bottom-up exploitation capacity, a detailed mapping of the sectoral economic profile within the studied *place* is conducted, using company demographics data, strategic documents and semi-structured interviews with key stakeholders.

Identifying exploitation capacity. The third dimension of the OAAT is concerned with the 'exploitation capacity' of specific groups and initiatives. As 'change agents', they can form new distinctive innovation and economic activities in the place (e.g., R&D activities, and business formations). The process here is centred on identifying emerging critical mass of experimentation and discovery, and of knowledge and technology recombination. This can be examined on the basis of the scale of specific activities such as (applied) research projects, development projects, new infrastructure investment. The 'capacity' of any emerging 'niche' to catalyse new/additional innovative and entrepreneurial ideas is linked to the ability to align

Table 1. Overview of the integration of three levels of opportunity space into the three dimensions of the Opportunity Areas Analysis Tool (OAAT).

| | Key change agents | Attributes and actions | Empirical evidence |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Trends | <ul style="list-style-type: none"> • Policy and investment attitudes (transregional) | <ul style="list-style-type: none"> • Developmental priorities and strategies (political, societal and economic) • Scientific evidence • Public opinion | <ul style="list-style-type: none"> • Geographical, demographic and socio-economic data • Local economic strategies • Regional skills assessments • Research organizations' strategies • Government/corporate investment |
| Capabilities | <ul style="list-style-type: none"> • Organizations and consortia (inter-organizational, regional) | <ul style="list-style-type: none"> • Existing innovation and economic activity • Inter-institutional relationships | <ul style="list-style-type: none"> • Resources and facilities • Organizational structures • Network analysis • Stakeholder groupings |
| Capacities | <ul style="list-style-type: none"> • Individual actors, small groups and clusters (within organizations or partnerships) | <ul style="list-style-type: none"> • Experimentation and discovery • Knowledge and technology recombination • New/additional innovation and entrepreneurial ideas | <ul style="list-style-type: none"> • R&D projects • (Re-)development projects • Company formation (start-ups/spin-offs/community enterprise) |

the visions of all stakeholders to marshal the 'capabilities' towards addressing emerging 'trends'.

Deploying the OAAT

Contexts of the cross-study

MLG arrangements for managing city-regions have been evolving in the United Kingdom over the last decade with some institutional variations in different policy areas across the devolved nations (Huggins & Kitagawa, 2012; Ayres et al., 2018). In the context of Scotland, the principle of inclusive growth was adopted as part of the refreshed Scotland Economic Strategy in 2015, and new 'place-based' inclusive growth approaches are being explicitly linked to City Region Deals (Scottish Government, 2016, p. 8).

In Scotland, the 'City Region Deals' and 'Growth Deals' are agreements between the UK government, Scottish government, local authorities (councils) and other local partners. They are designed to invest in projects tailored to the needs and strengths of Scotland's regions and bring about long-term strategic approaches to improving regional economies. This alignment of governance arrangements for the deals may reflect key new multilevel institutional configuration for both *city* and *non-city*-regions (Clelland, 2020). This study is situated in the

socio-political context of the Edinburgh and South East Scotland City Region Deal (ESES CRD), which was formally agreed in August 2018.²

The ESES CRD consists of six local authorities (City of Edinburgh Council, Midlothian Council, West Lothian Council, East Lothian Council, Fife Council, and the Scottish Borders Council), together with regional universities, colleges and the private sector. The study specifically focuses on two local authority areas, as targets of our investigation of the opportunity spaces, namely, Fife and the Scottish Borders. There are some similarities and differences between the two local authority areas. Both are adjacent to the City of Edinburgh, and each includes areas with substantial rural characteristics. Both local authorities are part of two 'deals,' characterized by the complexity of their geographical, economic, administrative and political 'boundaries' in the MLG policy structure. Fife and the Scottish Borders demonstrate contrasting industrial structures and respective territorial change trajectories with a set of common data-driven innovation (DDI) opportunity areas as depicted below.

Within the context of the ESES CRD, more specifically, the present analysis focuses on one specific programme: the Data-Driven Innovation (DDI) Programme. The DDI Programme is a 15-year programme, funded as

part of the City Region Deal led by the University of Edinburgh in partnership with Heriot Watt University, building on crosscutting research strengths in informatics, artificial intelligence (AI) and robotics. At its core, the DDI Programme aims to support organizations and individuals in the city-region benefiting from the cutting-edge research and development in the generation, storage, analysis and use of various forms of data.

The DDI Programme aims to help establish the city-region as ‘the data capital of Europe, drawing in inward investment, fuelling entrepreneurship and delivering inclusive economic growth’³ by support training and upskilling, developing new research, translating findings to be adopted by businesses, building new datasets and encourage entrepreneurship.

In this study, we conceptualize the DDI Programme as a shift in ‘landscape’ as part of the future place-based visioning. While DDI activities including AI technology and digital platform developments are highly contingent on ‘place contexts’ and ‘sectoral specificities’ particular to user ‘application scenarios’ (Yu et al., 2021, pp. 5–6), as data become a critical resource, actors controlling data develop ‘institutional power to shape the formation of the data-driven industry’ (p. 9). In the case studies presented below, we examine the effectiveness of the OAAT as an analytical tool in articulating the DDI agenda in relation to the place-based and sectoral specific future visions of Fife and the Scottish Borders, respectively (Figure 2).

Empirical approach

The empirical data collection was carried out between 2018 and 2020 based on a mixed-method approach.



Figure 2. Mainland Scotland and the Edinburgh and South East Scotland City Region, highlighting the participating local authorities and specifically the two case studies: Fife and the Scottish Borders.

We adopt a cross-case study with a ‘controlled comparison’ (George and Bennett (2005, p. 81) based on our own deployment of the OAAT within the two places. This helped us identify variation in how actors in each of the local authority areas have responded to the DDI opportunities as well as evaluate its effectiveness as a visioning tool. Deploying the OAAT framework as the ‘opportunity scanning’ (Fabbri, 2016, p. 497), we started the study with discussion of the DDI visions between the lead stakeholders: the Council and the College in each area. Then based on the initial discussion, the researchers identified the overlaps between local priorities and the key DDI areas of activities at the University of Edinburgh. Based on the initial qualitative data collection, we built on secondary data analysis examining key policy documents (e.g., local economic strategy) and other governmental documents, collated evidence including science and innovation audits, business datasets such as FAME database, and regional economic and skills datasets. These were combined with the following set of primary data gained through semi-structured interviews in each of the local authority areas to form the ‘trends’ framework.

The next phase of the OAAT deployment includes careful mapping of key stakeholders’ capabilities using individual interviews, focus group meetings as well as internet searches, focusing on existing industry, training provisions and research institutes and innovation centres. In each local authority area, over 30 semi-structured interviews (average 45 min) were undertaken (for further information, see Appendix A2 in the supplemental data online). Interviewees were initially chosen from key stakeholders such as local industry, academic/educational⁴ and governmental sectors, including local authorities and the economic development agencies. Furthermore, in order to assess the ‘equivalence’ of the visions behind the opportunity space, we aimed to capture alternative narratives about the evolution of a particular place as ‘opportunity space’ over time. This can only be done through conversation with a wide variety of stakeholders and local actors going beyond the existing and most visible ones, to broaden narratives on the territorial future.

Interviews were recorded, transcribed and analysed following the OAAT framework.

The analytical process included:

- Identifying actors’ alignment with ‘trends’, their ‘capabilities’ and their ‘capacity’ for involvement within any of the emerging pathfinder projects (i.e., DDI Programme).
- Investigating the co-constructed alignment of ‘trends’ marshalling ‘capabilities’ and the exploitation ‘capacities’.
- Identifying ‘opportunity areas’, that is, emerging niches possessing a critical mass of activities and reasonable competitive advantage.

Throughout the deployment of the OAAT framework, we further developed the OAAT methodology by

combining insights from systems thinking and scenario development methods (Harper & Georghiou, 2005; Tewdwr-Jones & Goddard, 2014). This methodological approach is also informed by works on innovation strategies and industrial transition (Kleibrink et al., 2017; Organisation for Economic Co-operation and Development (OECD), 2019), highlighting the need to build informational basis, defining the scope of the strategy, develop governance structure and devise implementation/transformation roadmaps.

Realizing opportunity spaces with the OAAT

The proposed new visioning framework, the OAAT, aims to help identify not simply ‘narratives of change’ but also ‘narratives for change’ (Beer et al., 2021, p. 12) as part of the creation of opportunity spaces. The analysis of the three dimensions of the OAAT framework included existing technologies, emerging capabilities and future visions. The OAAT’s deployment was intended to help enable the mobilization of resources towards the ‘trend’ by defining ‘time-specific’, ‘place-specific’ and ‘agent-specific’ processes to realize ‘opportunity spaces’ (Grillitsch & Sotarauta, 2020, pp. 714–719).

As a cross-case study, the deployment of the same methodology in the two chosen local authority areas within the scope of the DDI agenda of the ESES CRD highlighted different socio-economic environments and industry structures. Fife is a very diverse local economy, home to some of the most industrialized areas on the East Coast of Scotland, while the vast majority of the area is rural in character. Having lost the (coal) mining industry in the second half of the twentieth century, there are areas with significant deprivation and physical dereliction in Fife. Scottish Borders is an area of strong rural characteristics. Lacking big local business partners, local economic development has stagnated and the dispersed rural towns and villages have been losing traditional industrial base (e.g., textiles) (for details, see Appendix A1 in the supplemental data online). The two areas may be seen as further distanced from the City of Edinburgh, the urban core of the ESES CRD, compared with other three areas (i.e., Midlothian, East Lothian and West Lothian). While the two local authority areas share some of the ‘trends’ through the ESES CRD strategies, investment⁵ and the inclusive growth ambitions, there are significant variation between the two local authority areas in terms of socio-economic characteristics. We identified different configuration of local stakeholders’ existing core ‘capabilities’, as well as their exploitation ‘capacities.’

The key issues in our investigation include the (non) presence of physical infrastructure, sectoral bases of businesses, and knowledge bases that affect the evidence collection about the perceived futures of diverse local actors through their interactions. By drawing on a series of interviews within each of the local authority areas (for a scope of anonymized interviewees, see Appendix A2 in the supplemental data online) and analysing company

demographics (using FAME database), we mapped out the existing industry strengths along with the current capabilities, as well as new exploitation opportunities in the DDI related areas. Accordingly, we identified *place-specific* DDI opportunity areas in Fife and the Scottish Borders, respectively. The key differences between Fife and the Scottish Borders include the nature and levels of industry demands, the structures of existing local leadership and inter-organizational partnerships, and the extent of existing collaborative links with universities. These attributes related to local industrial profiles and the multiscale governance structures appear to define the paths to the realization of the ‘opportunity spaces’. In addition, the ‘agency of change’ (Beer et al., 2021) differed significantly between Fife and the Scottish Borders as summarized below (see Table 2 for an overview).

Fife. Fife’s Economic Strategy (2017–2027)⁶ sets out a joint strategy between Fife Economy Partnership, Opportunities Fife Partnership and Fife Council, to ‘achieve sustainable and fair economic growth for Fife’. This is set in the multilevel policy governance structure, including the Scottish government and City Deals. Fife Council hosts two distinctive deals: the ESES CRD, through which the University of Edinburgh is engaged with DDI Programme, and the Tay Cities Deal,⁷ covering the north-east of Fife including the University of St Andrews’ Eden Campus low-carbon research project at Guardbridge. In Fife, core private–public partnerships between the local council and local businesses had pre-existed the ESES CRD initiatives.

At the time of our OAAT study in 2018 and 2019, the links between a big multinational partner, Fife College and the University of Edinburgh were being strengthened, leading to large R&D investment at an advanced manufacturing cluster at Rosyth. On these bases of existing industrial capabilities and partnerships between ‘anchor tenants’ (Bailey et al., 2018), a tripartite DDI strategy of integrating research and business networks, leading industrial renewal through data and digital technologies, and developing a unified engagement platform and investment into core (data) infrastructure was proposed, along with recommendations for each of the identified DDI opportunity areas (for details, see Kitagawa et al., 2021).

The Scottish Borders. In the Scottish Borders, the current economic development strategy, Scottish Borders Economic Strategy 2023, was published by the Scottish Borders Council in 2013, identifying ‘textiles, tourism, food and drink, renewables and creative’ as key target industries.⁸ In terms of governance, the establishment of the new economic development agency – South of Scotland Enterprise (SOSE) – in April 2020 added a new layer of policy structure and growing need for strategic coordination. Further, the Scottish Borders Council is part of two development deals: the ESES CRD and the Borderlands Inclusive Growth Deal, which was formally

Table 2. Summary of the Opportunity Areas Analysis Tool (OAAT) analysis of data-driven innovation (DDI) opportunity areas and opportunity spaces: Fife and the Scottish Borders.

| Local authority areas | Fife | Scottish Borders |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OAAT SCOPE | Edinburgh and South East Scotland City Region Deal (ESES CRD) Data-Driven Innovation (DDI) Programme | |
| TRENDS | | |
| <i>Time specific</i> (strategic direction within the studied time frame) | Fife Economic Strategy (2017–2027) <i>Lead industrial renewal through data/digital technologies</i> | Scottish Borders Economic Strategy 2023 (2013) <i>Support more inclusive development and growth through data/digital technologies</i> |
| <i>Place and sector specific</i> (characteristics of the strategic direction) | <i>Advanced enabling infrastructure development, more homogeneous sectors</i> e.g., Advanced manufacturing, Fintech | <i>Light infrastructure investment, heterogeneous sectors and small-scale entrepreneurship</i> e.g., Agritech, natural capital, tourism |
| <i>Agent specific</i> (bodies directly engaged in setting developmental priorities) | <ul style="list-style-type: none"> • Fife Council • Fife College | <ul style="list-style-type: none"> • Scottish Borders Council • Borders College • South of Scotland Enterprise |
| <i>Coexisting deals</i> | <i>Tay Cities Deal; including St Andrews University</i> | <i>Borderlands Inclusive Growth Deal; including Edinburgh Napier University</i> |
| <i>Agency nature – place-based leadership</i> | <i>Mature relationships between several well-defined stakeholders and their groupings; private–public partnerships</i> | <i>Emerging multiscalar relationships between key stakeholders</i> |
| CAPABILITIES | | |
| <i>Partners and resources relevant to the scope</i> | <ul style="list-style-type: none"> • Fife Innovation Investment Programme (ESES CRD) • Multinational engineering companies (e.g., Babcock, Burnt Island Fabrications) • FinTech Scotland • FinTech Skills Academy/Fife College • Fife Health and Social Care Partnership • Queen Margaret University–Fife College partnership • DDI/The University of Edinburgh <p><i>Core industrial-scale research and development (R&D) and production capabilities, established ecosystem of training and technology/knowledge transfer in need of realignment</i></p> | <ul style="list-style-type: none"> • Borders Innovation Park in Tweedbank (ESES CRD) • South of Scotland Destination Alliance • Borders Railway • Mountain Bike Centre of Scotland/Edinburgh Napier University • Borders Care Career Academy (Scottish Borders Council, SBCares, Borders College and NHS Borders) • The South of Scotland Digital Skills Hub • The Centre of Excellence in Textiles in Hawick • School of Textiles and Design, Heriot Watt University; • DDI/The University of Edinburgh <p><i>Dispersed and fragmented light-industrial R&D and production capabilities, loosely integrated ecosystem of training and technology/knowledge transfer, emerging digital skills pathways</i></p> |

(Continued)

Table 2. Continued.

| Local authority areas | Fife | Scottish Borders |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lead (DDI-relevant) sectors Identified through document analysis, business demographics (from FAME database) and interviews | <ul style="list-style-type: none"> • Energy and renewables • Manufacturing including engineering • Finance and business services including Fintech • Digital technology including ICT • Tourism, culture and creative industries • Food and drink • Health and care • Construction and civil engineering | <ul style="list-style-type: none"> • Tourism • Advanced manufacturing • Health and social care • Energy • Agriculture |
| CAPACITIES Existing niche projects aligned with the emerging opportunity space as defined through scope and capabilities, i.e., agency and sector | <ul style="list-style-type: none"> • Rosyth Advanced Manufacturing Park • Fastblade (University of Edinburgh, Babcock) • Levenmouth Demonstration Turbine • Queensway Park Data Centre • Fife Food Port <p><i>Existing capacity to assemble stakeholders, develop concrete proposals, fund infrastructure</i></p> | <ul style="list-style-type: none"> • Mountain Bike Innovation Centre (Borderlands Inclusive Growth Deal) • Workforce Mobility Project (ESES CRD) • Scotland Starts Here (South of Scotland Destination Alliance) • Borders College Technology Enhanced Care Hub; STEM Hub; Construction Hub • Offshore wind farm in Eyemouth (NnG Offshore Wind Limited, Eyemouth Harbour Trust) <p><i>Early stages of developing specific projects, scattered leadership (public and private), reliance on public funding (and initiative)</i></p> |
| OPPORTUNITY AREAS The emerging opportunity space to form a vision of how to align niche capabilities with systemic capabilities to respond to landscape/trends | <ul style="list-style-type: none"> • Advanced manufacturing for engineering and construction • Autonomous systems and sensors on marine and airborne platforms • Data intelligence for enterprise services including fintech • Data-enhanced agri/food and drink • Distribution and logistics • Smart systems for health and well-being | <ul style="list-style-type: none"> • Smart high-added-value manufacturing • Digitally integrated destinations • Autonomous systems for resources and assets management • Energy-efficient infrastructure • Predictive and responsive well-being technologies |

signed in March 2021, encompassing five local authorities in the south of Scotland and the north of England, as well as the UK and the Scottish governments.

The OAAT analysis in the Scottish Borders was undertaken between 2020 and 2021 at the time of the Covid-19 pandemic as well as evolving cross-border multiscalar governance. Recognizing the lack of big local business partners, ‘niche’ exploitation opportunities related to data-driven and digital technologies were identified across the key industry sectors. In particular, we recognized entrepreneurship opportunities responding to growing societal and demographic needs. Institutional gaps were noted in terms of holistic business and innovation support and better connectivity between businesses. Along with the five identified DDI opportunity areas, through the OAAT framework, we recommended strengthening links between the Borders College, the Scottish Borders Council, and the SOSE in business

support and enterprise development (for details, see Vidmar & Kitagawa, 2021).

OAAT data and results

Table 2 provides a summary of the collected evidence, developed analysis and the identified DDI opportunity areas in Fife and the Scottish Borders, drawing on the conceptual frameworks deployed in the study.

The evidence assembled is designed to help relevant stakeholders to pursue emerging opportunity areas under the broad theme of DDI. Given the uncertainty about the trajectory of technological and social change in DDI, the OAAT framework provides a conceptual and methodological framework, which helps local actors align narratives through ‘spatially localized sharing, matching and learning’ (Kedron et al., 2020, p. 9) about technologies and local institutions. These processes will help build common scenarios and realize opportunity spaces by combining insights

between trends and capacities, that is, macro- ('landscape') to meso- ('socio-technical regime of actors') levels, and thus enabling the growth of the microlevel capacity to exploit the 'niche' opportunities (Geels, 2011).

DISCUSSION: TERRITORIAL CHANGE AGENCY, INCLUSIVE GROWTH AND THE EQUIVALENCE OF VISIONS

The aims of deploying the OAAT framework is to collate and critically assess evidence that can support a collective exploration of the future vision of the place. Throughout the methodology design and deployment, we emphasized the importance of territorial 'change agency'.

Important roles are being played by different types of 'innovation intermediaries' as agents in territorial change. Recent literature focuses on the roles played by local key anchor institutions strengthening innovation and entrepreneurship intermediation support through knowledge and technology brokerages. For example, multiple universities' 'tech transfer' units, business development managers, and publicly supported organizations (e.g., Innovation Centres, Centres of Excellence etc.) are facilitating innovation and university-business linkages across the city-region(s). However, this model may exclude many smaller towns and rural areas without such assets. More consideration should be given to the wider spatiality and complexity of agencies' mandates and governance (e.g., places without universities, and places where universities are not willing to play such proactive roles, and relationships between multiple universities in a city-region context), and how these would affect visioning of the territorial future.

Within the context of the DDI Programme, the University of Edinburgh, in partnership with Heriot Watt University, has aspired to develop a place-based leadership role within the DDI Programme as lead institutions, by facilitating the expansion of DDI as a framework for inclusive growth agenda as part of the ESES CRD. While the role of a university in urban visioning is discussed in literature, more attention should be drawn to the agency of universities intertwined with the complex geography of the city-region in the multiscalar governance structure. For instance, in the Scottish Borders, while three universities based in the City of Edinburgh are playing different innovation intermediary roles, respectively, with different areas of expertise, the Borders College has built Hubs for innovation and upskilling and played a role as a key innovation intermediary. In Fife, there are two City Deals: while St Andrews University located in the north-east area of Fife is a key part of the Tay Cities Deal. The University of Edinburgh and Queen Mary University, both located in Edinburgh, outside of Fife, are working closely with local partners in Fife as part of the ESES CRD.

Governance arrangements in specific place-based contexts and local institutional architectures make a difference (Pike et al., 2015). In this study, we mainly focused on the identification of DDI Opportunity Areas in the framework of the ESES City Region Deal to build a collective

future vision. One of the critical questions in deploying this methodological approach for the visioning is how to ensure the 'inclusive growth' agenda is conceptualized and evidenced as part of the identification of opportunity areas. The Scottish government, and the ESES CRD have identified their inclusive growth objectives, and each local authorities have their own inclusive growth agendas. For example, for the Scottish Borders, the data-driven provision of public transport is critical for the inclusive growth agenda, enabling training and employment initiatives (e.g., apprenticeships). Furthermore, better connectivity can improve the place-based ecosystem conditions, which can attract more businesses to locate in the Scottish Borders. Some examples of inclusive growth agenda and DDI potentials in Fife and the Scottish Borders are discussed in Appendix A in the supplemental data online.

Beer et al. (2021) suggest that the post-Covid world may represent a new set of 'opportunity spaces' and the potential to develop place-based future visions of sustainable and inclusive growth, supported by diverse actors. However, what is meant by inclusive growth, what the aims of inclusive growth are, and how policymakers and practitioners can deliver against those aims, is often 'blurry and ill-defined' (Statham & Gunson, 2019, p. 4). In the report *Delivering Inclusive Growth in Scotland*, for example, one of the models of inclusive growth is depicted as 'narrowing inequalities through place-based approaches' (Statham & Gunson, 2019, p. 4). As Lee (2019) points out, there is a need to find models of inclusive growth that resonate at the local level, which need to encompass both urban and non-urban areas set within the MLG structure. Our work also highlights potential tensions and challenges encompassing policy actors at different levels of governance (i.e., local authorities, economic development agencies, the Scottish government and the UK government), interacting both vertically and horizontally. Further, both in Fife and the Scottish Borders, we noted growing relationships between the neighbouring deals. The coexistence of multiple City Deals and Growth Deal (i.e., the ESES CRD; Tay Cities Deal; Borderlands Inclusive Growth Deal) has a significance to the understanding of the emerging additional MLG structure and the challenges of interscalar future visioning.

For the place-based leadership to be effective, intelligence and data gathering is not sufficient. In both Fife and the Scottish Borders, we have noted an emergence of 'place renewing leadership' (Bailey et al., 2010) by gradually sharing and enhancing capacities and capabilities. As part of the place-based foresight exercise, an alignment of visions is imperative – through the identification of opportunity areas as specific application scenarios. In a multiscalar visioning process, it is important to pay attention to the 'equivalence' of visions. As Barca et al. (2012, p. 148) put it, it is important to build 'a system which promotes a space for public debate by all local actors open to dissent and alternative views, and coordination and collaboration between different levels of governance and institutions'.

There is no one-size-fits-all approach to tackling these issues and realizing opportunity spaces by integrating opportunity areas along with the inclusive growth agenda. The OAAT framework is an attempt to initiate such multiscale alternative narratives, which needs to be followed by the coordination of capabilities through subsequent negotiation and agreement on the terms of the operationalization of the visioning processes for the future strategic decision-making.

CONCLUSIONS

The insights from this study emphasize the fruitful linkages between the place-based future visioning exercises and theoretical perspectives from the literature in evolutionary economic geography. In line with Grillitsch and Sotarauta (2020) and Beer et al. (2021), this study builds on the evolutionary economic geography by focusing on the temporal processes of path creation, aiming to integrate foresight and future visioning as narratives. These narratives are centred on information gathering, analysing, sharing and learning around emerging 'windows of locational opportunity' (Boschma & Van Der Knaap, 1999), which would arguably help reduce cognitive dissonances (Fabbri, 2016). Future visioning is expected to help enhance the alignment of specific capacities and capabilities within the development context of *places* to respond to emerging trends and set actions towards the realization of perceived opportunities by a diverse range of local and non-local actors.

This study addresses the need to integrate both theoretical and empirical approaches, making contribution to the following three thematic areas. First, the study depicts the conceptual framework and processes of evidence collection as part of visioning exercise. The OAAT has been designed and deployed aiming to help collate and assess the *place*-based evidence for the future visioning. What constitutes 'empirically sound evidence,' and how to advance the use of data in decision-making and planning to support innovation and entrepreneurship remains generally understudied (Feldman & Lowe, 2017, p. 35). For such visioning processes to work in different geographical and sectoral contexts and be transferable as a both an analytical and policy tool, the OAAT as a conceptual tool needs a flexibility to respond to a variety of local spatial conditions (e.g., urban, suburban and rural), and to adapt different industry and sectoral conditions of a specific place. This was partially examined within the diverging contexts of the two cross-cases presented here, but we would welcome further research exploring multifactor (e.g., geographical, political, economic, historical, etc.) variance.

Second, the study contributes to the understanding of the dynamic and complex nature of 'place-based industrial strategies', which seek to implement a 'transition' in local and regional economies. We empirically examined a specific 'socio-technical regime' (i.e., the DDI Programme), and the alignment of technological opportunities often considered to be urban in nature, within

diverse rural and semi-rural conditions in a city-region. The public and private actors in the multiscale structure are conditioned by a combination of different geographical and sectoral characteristics affecting their power as agencies in a *place*-making. *Place*-based leadership would also depend on the dynamics of MLG relationships, through a spatially distributed system of governance between vertical administrative levels and horizontal collaboration and coordination across stakeholders. At the same time, the confluence of governance and power structure(s) warrants comparative investigation across a variety of geographical and political systems.

Third, the study addresses the critical question of 'inclusive growth' and the 'equivalence' of visions and evidence. It is important to examine the extent to which such evidence integrates 'alternative views' and finetune the opportunity areas and the ownership of such opportunities. Such critical and reflective future visioning exercises, combined with the enhanced local interactive intelligence building, creation of shared visions, and relevant institutional building, could provide a new pathway for territorial development. It is argued that supporting governance structure is needed to implement a shared vision with a wide inclusion of actors (Moodysson et al., 2016). More analysis is required regarding how to incorporate the principle of inclusive growth agenda as part of the *place*-based future visioning, and different roles played by national government, regions, city-regions, cities, towns and communities.

The cross-case study presented in this article highlighted the complexity of spatiality of key anchor institutions acting as intermediaries. Further, the brokerage roles of city-region actors depend on their positionality defined by institutions that work across administrative boundaries and the nature of embeddedness of firms in relation to both local and global business networks and innovation systems (Sigler et al., 2021). It is also noted that beyond core cities, firms' engagement and embeddedness within their local place may be limited, particularly in small and medium sized town economies (Mayer & Motoyama, 2020; Salder & Bryson, 2019). Through the cross-case study, we peeled back some of the institutional layers in the Scottish/UK context. In order to test the effectiveness and transferability of the proposed conceptual and analytical approaches to build *place*-based collective intelligence for inclusive future visions and narratives, international comparisons would be critical to demonstrate the (global) applicability of the OAAT approach.

The current study has several key limitations. First, the deployment of the OAAT is limited as it was carried out as an early opportunity scanning study for the future development. As such, the scope and depth of the data collection was compromised. Further analyses are required for a long term and on a continuing basis over time across all the phases of foresight and decision making including 'analysis (intelligence)', 'discussion' and 'validation' (Fabbri, 2016). Second, more extensive mapping of capabilities on the local level including skills, infrastructure and resources, and exploitation capacities on an individual level over

time would help analyse the evolution of opportunity spaces in the city-region. Third, in order to provide an in-depth assessment of the relational connections and dynamics (Rocha et al., 2021), further methodological development is required, for example, by combining social network analysis and qualitative interview data. For example, by using social network analysis, we may be able to examine stakeholders' inter-organizational relationships. This also opens up theoretical as well as methodological issues of how to evaluate the nature of networks, dynamics of capabilities and firms' embeddedness in places.

In applying the proposed analytical tool to inform policy development, we are reminded of the inherent tension between 'path dependency' and finding new 'regional growth paths' (Martin & Sunley, 2006; Grillitsch & Sotarauta, 2020) in the formation of regional policies. As such, regional policy needs to balance between continuity and change. A new path creation can be a long-term and slow process in order to realize an opportunity space in a variety of geographical and sectoral contexts. For the OAAT to inform future policy development, we also need to be aware of the contesting nature of evidence required to develop a strategic common vision and decision-making.

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NOTES

1. According to Geels (2011), the definition of 'micro-meso-macro'-levels relates to differences in 'scale' and

the number of actors that reproduce regimes (and niches). Thus, levels refer to different 'degrees of stability', which are not necessarily hierarchical.

2. At the ESES CRD level, the City Region Deal Benefits Realisation Plan sets out five overarching 'inclusive growth objectives': Accelerating inclusive growth; Removing the physical barriers to growth; Community benefits through procurement; Targeted skills interventions; and Social benefit through innovation. Further, various 'inclusive growth challenges' specific to the city-region are identified, namely: slow and uneven regional growth; skills gaps and inequalities; transport; housing; and other connectivity issues (Edinburgh and South East Scotland City Region Deal Joint Committee, 2020).

3. See <https://www.ed.ac.uk/usher/news-events/news-2019/data-driven-innovation-update>. To complement this, through the Integrated Employability and Skills (IRES) programme and its private, public and third-sector partnership, the 'DDI targeted skills gateway' focuses on DDI career and skills in the city-region. It aims to improve digital skills in the city-region by working with schools, further and higher education, employers, and training providers.

4. In order to map out the emerging 'capabilities' and 'capacities' that could be aligned with local actors, their emerging capacities and capabilities, we also carried out interviews with both academics and business development managers at universities, and managers at some of the organizations acting as an intermediary between local industry and higher education institutions in Scotland (e.g., Interface).

5. A Programme of Investment in Economic Infrastructure focuses on creating innovation activities in Fife and the Scottish Borders, including digital technologies, data and the circular, low carbon economy (see <https://esescityregiondeal.org.uk/innovation>).

6. Fife's Economic Strategy 2017–2027, <https://www.investfife.co.uk/wp-content/uploads/2021/07/fifes-economic-strategy-2017-27.pdf/>.

7. Angus, Dundee, Fife and Perth & Kinross councils have worked together as part of the Tay Cities Deal. In Fife, across the ESES CRD and Tay Cities Deal, informal arrangements to support potential synergies between the two deals have been emerging.

8. Scottish Borders Economic Strategy 2023, https://www.scotborders.gov.uk/downloads/download/275/economic_strategy_2023/. More recently, the South of Scotland Regional Economic Strategy (RES) was published in September 2021 (<https://sosrep.dumgal.gov.uk/media/24921/South-of-Scotland-Regional-Economic-Strategy/pdf/South-of-Scotland-Regional-Economic-Strategy.pdf>).

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