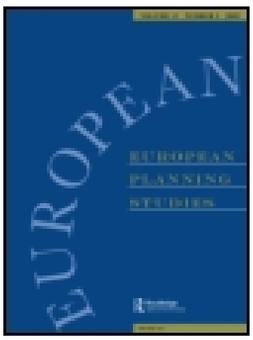

European Planning Studies

ISSN: 0965-4313 (Print) 1469-5944 (Online) Journal homepage: https://www.tandfonline.com/loi/ceps20

# Exploring the normative turn in regional innovation policy: responsibility and the quest for public value

Elvira Uyarra, Barbara Ribeiro & Lisa Dale-Clough

**To cite this article:** Elvira Uyarra, Barbara Ribeiro & Lisa Dale-Clough (2019): Exploring the normative turn in regional innovation policy: responsibility and the quest for public value, European Planning Studies, DOI: 10.1080/09654313.2019.1609425

**To link to this article:** https://doi.org/10.1080/09654313.2019.1609425



Published online: 22 May 2019.

EUROPEAN PLANNING STUDIES
https://doi.org/10.1080/09654313.2019.1609425



# Exploring the normative turn in regional innovation policy: responsibility and the quest for public value

Elvira Uyarra [a,b], Barbara Ribeiro [a] and Lisa Dale-Clough[a]

[a]Manchester Institute of Innovation Research, Alliance Manchester Business School, University of Manchester, Manchester, UK; [b]Western Norway University of Applied Sciences, Bergen, Norway

**ABSTRACT**

The perceived ineffectiveness of traditional innovation policies in solving societal challenges such as poverty, ageing, climate change as well as problems of regional economic restructuring has motivated a recent 'normative turn' in innovation policy. This has shifted the debate on the rationales for intervention from market and system failures to accommodate more transformative views but also other approaches rooted in the notion of public value and has led innovation scholars to question not just the how and how much of innovation but also key issues of directionality, legitimacy and responsibility. By engaging the processes through which actors 'know, investigate and perform innovation', we argue that the concept of responsible research and innovation (RRI) offers a potentially useful lens for re-casting our understanding of innovation-related decision making. We apply RRI to assessing the opportunities and challenges of public procurement as an instrument of challenge-oriented and transformative innovation policy. More specifically, we look at how local authorities in the UK are using the Social Value Act to define priorities and articulate demand around social, environmental and community needs as well as coordinate different processes and actors, policy levers and processes.

**ARTICLE HISTORY**
Received 23 August 2018
Revised 1 March 2019
Accepted 15 April 2019

**KEYWORDS**
Responsible research and innovation; regional development; innovation policy; public procurement

## 1. Introduction

> [W]e want to see public services delivered with values at their heart, where the wider social benefits matter and are recognised. […] If we are to build a fairer society, in which the public has greater trust in businesses not only to make a profit but also to play a responsible role in society, then we must use the power of the public sector to lead the way.
> Rt Hon David Lidington MP, 25 June 2018

The minister was speaking in the context of the renewal of the Social Value Act, implemented by the UK government in 2013. Every year, around £200 billion are spent by the government in the purchase of services and goods through public procurement in the UK. The Act was introduced to improve the social legitimacy of public procurement by encouraging the private sector to deliver greater social, economic and environmental

**CONTACT** Elvira Uyarra elvira.uyarra@manchester.ac.uk Alliance Manchester Business School, University of Manchester, Manchester, M13 9PL, UK

benefits as part of their contracts. Motivated by the new legislation, local governments across the UK have worked towards crafting their own social value policies, combining and embedding them into their development strategies (see Cabinet Office, 2015). This activity is being replicated across Europe as the European Commission encourages procurement policies aimed at creating a more innovative, green and socially-inclusive economy.[1] Procurement policies like these can be regarded as a response to a 'public-value failure' of innovation policy mechanisms. Barry Bozeman defines this failure as a result of the lack of capacity of the market and the public sector to provide 'goods and services required to achieve core public values' (Bozeman, 2002, p. 150).

The concept of public-value failure brings with it a fundamental question on how public value is defined in the first place. In innovation policy parlance, public value has been associated, for example, with the notion of 'societal challenges'. Edler and Fagerberg (2017) define innovation policy broadly as policies that affect innovation, understood as 'the introduction of new solutions in response to problems, challenges, or opportunities that arise in the social and/or economic environment' (Ibid, page 4). Rooted in market and system failure concepts, innovation policy thinking has so far paid too little attention to the *content* of innovation and has been ineffective in addressing societal challenges such as poverty, ageing, climate change, and economic renewal (Coenen, Hansen, & Rekers, 2015; Frenken, 2017; Weber & Rohracher, 2012). This has motivated recent advocates of a greater or improved challenge orientation in innovation policy (Mazzucato, 2013; Schot & Steinmueller, 2018) and the use of targeted policies to articulate societal needs on the 'demand side' (Boon & Edler, 2018). Regional innovation policy scholars have also reacted and argued for greater focus in scholarly debates on the direction of innovation and change in order to address problems of economic restructuring and territorial disparities (Tödtling & Trippl, 2018). This backdrop requires regional innovation scholars to redefine the function of the public sector away from market-based rationales and towards an investment logic that understands economic development as 'the expansion of capacities that contribute to the advancement of society' (Feldman, Hadjimichael, Lanahan, & Kemeny, 2016, p. 8).

Intersecting these debates in innovation policy scholarship is the emergence of responsible research and innovation (RRI) as a popular concept for exploring the relationship between science, technology, innovation and society (Ribeiro, Smith, & Millar, 2017). Of particular concern to the RRI agenda is how to ensure innovation is aligned with societal needs and responds to pressing societal challenges. Much of the work around RRI has been focussed on publicly funded R&D, but the concept is being increasingly recognized and alluded to by the innovation policy community (Schlaile et al., 2017; Tödtling & Trippl, 2018). In this paper, we position RRI as a basis for developing more spatially sensitive and responsive approaches to implementing innovation policy at a regional level.

The discourses above, although emerging from different bodies of literature, illustrate a 'normative turn' in innovation policy rhetoric. To explore the meaning and relevance of such a turn for regional and local development, we mobilize regional innovation policy, public procurement and RRI concepts in tandem to make two particular contributions. Firstly, we broaden the scope, but narrow the scale, of RRI by using it as an analytical lens in a specific area of demand-side innovation policy: public procurement. Secondly, we further refine understanding of the opportunities and challenges of using public procurement as a policy instrument to argue that a bolder normative framework for the analysis of innovation policy in the context of societal 'grand challenges' or 'mission-oriented innovation policy' must a) have a focus on

creating public value; b) investigate how societal problems are framed; and c) assess the capabilities of different societal groups to engage in transformational change.

## 2. Evolving innovation policy discourse

In the last few years, we have witnessed the emergence of more critical perspectives on the design and objectives of innovation and on its capacity to support social change and contribute to the public good (Mazzucato, 2018a). This normative turn in innovation policy debates is illustrated by the growing interest in understanding how innovation might be used to respond to so-called societal challenges while generating both economic and public value (OECD, 2011). It is also a reaction to problematic assumptions in innovation studies that consider innovation as socially desirable *per se* (Røpke, 2012), and which have prioritized the analysis of innovation in technological terms rather than in terms of the *type* and, importantly, the *direction of change* produced by innovation.

Inspired by Schumpeter, scholars have long tended to assume that, overall, innovation automatically delivers public value, directly or indirectly. A symptom of this paradigm is the commonplace assumption that innovation equates to universally desirable solutions in terms of new services and products or improvement of current ones and that subsequently, policy prescriptions must focus on producing more, rather than better, innovations. This approach has ultimately failed to acknowledge that the ultimate goals of economic development are higher economic prosperity and quality of life and that intermediate goals such as innovation are just the means to the ultimate end of creating this prosperity (Feldman et al., 2016).

There are two key points in the subsequent evolutions of innovation policy away from this approach. These are a greater societal challenge orientation and problematisation of 'failures'; and greater attention to the link between regional development and transformative change. We introduce these in the sections below.

### *2.1. Societal challenge-orientation*

Given the highly complex and uncertain nature of technological knowledge, government intervention has been justified in order to address so-called 'market' and 'system failures' leading to under-investment in R&D. The former justifies policy interventions that raise the level of overall investment in R&D, which is assumed to be sub-optimal if left entirely to the market. The latter more recent notion justifies policy intervention on the basis of addressing a wide range of 'system' failures explaining innovation underperformance in local, regional or national economies, such as capability, network, institutional and infrastructure failures (Woolthuis, Lankhuizen, & Gilsing, 2005). Though supposedly more sophisticated than the traditional market failure approach, the systems failure approach suffers from a static bias, taking institutional configurations as given. As a result, policies inspired by system failure rationales tend to reinforce 'existing actor positions, institutional arrangements and government roles', benefiting those actors, sectors and places that are better connected to the innovation 'system', and therefore favouring growth along existing and related paths of specialization rather than creating new paths (Frenken, 2017, p. 42).

The realization of the limits of a narrow conceptualization of system failure in innovation policy, and a renewed interest in innovation-active government has driven

discussions about a need for greater 'challenge-orientation' in innovation policy (Mazzucato, 2013; Schot & Steinmueller, 2018). In this context, Weber and Rohracher (2012) have argued that innovation policy needs to consider a more comprehensive set of 'failures', including directionality failure, demand articulation failure, policy coordination failure and reflexivity failure. They include a series of socially-relevant and political elements, including the design of collective priorities, i.e. societal challenges; the public acceptance of innovation; the dynamics between multiple innovation policy actors; and the high levels of uncertainty, ambiguity and ignorance inherent to innovation and social change. These elements emphasise the need for a normative lens for investigating and guiding innovation policy, for which Schlaile et al. (2017) argue more explicit and integrative research on directionality, legitimacy, responsibility, and their interrelations is necessary. In other words, it requires innovation scholars to address not just *how* to get there (which policies) but also fundamental issues of directionality (what future do we want), legitimacy (why do we want this future, who defines it), and responsibility (transformation by and for whom).

### 2.2 Regional innovation policies for transformative change

A normative turn in regional innovation policy discourses has equally been motivated by perceived limitations of regional innovation system approaches to address the challenges of regional economic restructuring (Tödtling & Trippl, 2018). Much of the regional innovation policy literature has been seen as too focussed on technological innovation (Jeannerat & Crevoisier, 2016) and biased towards successful agglomerations (Eder, 2018), implicitly assuming that innovation and diversification are positive *per se* (Phelps, Atienza, & Arias, 2018). Increasing within-country inequalities and growing discontent amongst places left behind by globalization (Rodríguez-Pose, 2018) have forced a debate around balancing economic gains from innovation with greater territorial and social equity (Iammarino, Rodríguez-Pose, & Storper, 2018; Barca, 2009).

As noted by Hartmann (2014), a 'virtuous cycle of qualitative diversification' is easier to achieve in places that already exhibit a considerable set of productive and human capabilities. Places without such abundance of productive and human capabilities (Sen, 1999) require policies that promote inclusive network structures and that provide more actors with 'better opportunities to assist, contribute to and benefit from the development processes of their socioeconomic environment' (Hartmann, 2014, p. 23). In other words, the public sector should focus on enhancing capabilities and ensuring that as many actors as possible are able to participate productively in the economy (Feldman et al., 2016; Iammarino et al., 2018). Barca (2009) considers equity to be an integral part of place-based policies, which should promote social inclusion through the provision of public goods and services tailor-made to contexts. The idea of creating, delivering and capturing public value should, therefore, be a key consideration of place based-policies.

The idea that regional innovation policies should enable regional actors to capture or anchor part of the global value and knowledge they help create for the benefit of the region is not new (Bailey, Pitelis, & Tomlinson, 2018; Crevoisier & Jeannerat, 2009). However, the concept of value is not clearly defined or at best informed by the literature on business strategy, thus begging several unanswered questions, such as what does regional value actually mean? Who does the 'valuing', and how? How is value created

and how should the key issues of directionality, legitimacy and responsibility that accompanied the shift to normative regional innovation policy be accommodated?

These questions reflect an emerging renewed interest in more inclusive and sustainable forms of regional innovation policy. Such an approach requires more active government intervention, more attention to distributive aspects and for innovation to be a means of achieving societal goals rather than an end in itself. However, this normative turn has still only a timid presence in regional innovation policy frameworks.

Evolutionary approaches to regional development (see e.g. Boschma & Frenken, 2011; Kogler, 2015) informing policy agendas such as smart specialization have been mainly focussed on firm-led regional branching, somewhat overlooking the influence of strategic or deliberate state action on the conditions for path creation and development (Feldman & Lowe, 2018), including the role of the state as 'producer, regulator, animateur and purchaser' (Morgan, 2013, p. 337). The emphasis has also been on how firms diversify into related or adjacent knowledge trajectories, overlooking the transformative potential of recombining unrelated pieces of knowledge (Castaldi, Frenken, & Los, 2015). The latter is less likely to happen naturally and requires the state to take a more proactive role (Frenken, 2017), for instance by bringing together unrelated technologies and industries that are present in an economy in the pursuit of societal or system-level challenges (i.e. the demand for solutions) (Janssen, 2015).

Scholars have also tried to address the lack of directionality in traditional approaches to regional innovation policy by looking to transitions studies and transformative innovation policy approaches (Frenken, 2017). The benefit of these perspectives is, according to Tödtling and Trippl (2018) that they better reflect the complex mix of policy actors that need to be aligned, coordinated and engaged to give policies a direction that is beneficial for the whole society. But despite the accommodation to complexity, the transitions literature has not sufficiently discussed how geography shapes the context and outcomes of transformative innovation policies (Coenen et al., 2015). Transformative innovation policy approaches (Schot & Steinmueller, 2018) also remains unclear about the role of regional policy in resolving the contested and contextual aspects of problem-identification and problem-solving. 'This is important because despite of labels of "grand" and "global", challenges are contextual' and do not 'present themselves as the same for every region or nation, as underlying problems affect places in different ways and to different extents'. (Wanzenböck & Frenken, 2018, p. 11). Mazzucato (2018b, p. 10) makes a case for 'granularity', suggesting that societal challenges, like sustainable development goals, for example, 'are useful to ensure focus' but are 'too broad to be actionable'. Challenges such as ageing societies, climate change, and energy security indeed encapsulate concerns pervasive across Western societies, yet they remain detached from local realities if they are not made operational and concrete in ways that relate to the public. Given the complex and contested nature of these challenges, they are also more likely to demand more mundane bottom-up diffusion and co-production activities rather than technology push strategies (Coenen et al., 2015; Frenken, 2017).

In what follows we offer some principles to inform these developments, drawing on RRI and public value as frameworks for guiding regional innovation policy.

## 3. RRI in the context of a normative turn in innovation policy

The concept of RRI originated in European research and innovation policy. It was proposed as a means to ensure that innovation responds to the values, needs and expectations

of society, delivering solutions to a number of societal challenges (European Commission, 2014). In its European conceptualization (European Commission, 2014), RRI requires all stakeholders, including civil society, to 'work together' to co-produce innovation. Like the 'demand articulation failure' proposed by Weber and Rohracher (2012), this vision of RRI is motivated by a concern about the public acceptance of emerging technologies and innovation. The first definition by von Schomberg (2011) positioned it as a means for focussing on the positive or 'right' impacts of public policy. However, as Von Schomberg himself notes, this is not a straightforward task, since it involves answering the challenging question of what counts as legitimate when defining the right impacts. Resonating with critiques of innovation policy based on directionality, legitimacy and responsibility failures (e.g. Schlaile et al., 2017; Weber & Rohracher, 2012), von Schomberg positions the contribution of the RRI approach as ensuring

> a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society). (von Schomberg, 2011, p. 9)

There is a lack of agreement on what RRI means across different sectors and disciplines. Since the birth of the concept, emerging conceptualisations of RRI have been shaped in ways that align it to the values and concerns of the different actors seeking to mobilize it, inside and outside academic circles. For example, RRI has been interpreted according to existing agendas within specific disciplines, who 'imported' their assumptions, methods and goals into their understandings of RRI. RRI has been represented as a bundle of approaches emerging from different communities from the field of technology assessment community, science and technology studies, ethics and risk assessment, among others (Ribeiro et al., 2017). Moreover, RRI has been mobilized in relation to a set of emerging technologies, most notably nanotechnology, synthetic biology, and geoengineering (e.g. McLeod & Nerlich, 2017; Rip, 2014; Stilgoe, 2016). As these technological developments carry with them a great deal of scientific uncertainty and typically a widespread 'fear' by innovators of potential public unrest and lack of acceptability (Marris, 2015), articulations of RRI have sought to expand longstanding frameworks dealing with the ethical, legal and societal aspects to contribute to their governance (Balmer et al., 2016; Guston, 2014). Strikingly, mundane innovation, or 'downstream' innovation which is ready for or has already reached the market, seems to have dropped off the RRI radar.

However, the governance of innovation through institutionalized everyday processes, such as public procurement, overlaps with RRI in terms of its remit, as it seeks to create and deliver public value (or its equivalent, social value) by supporting the development of innovation solutions focussed on addressing societal challenges. The interpretative flexibility of RRI mentioned above can be seen as an opportunity, as it allows us to use it as a lens to explore issues around the ethics and politics of innovation governance in a variety of contexts. One of the pioneering RRI frameworks proposed by Stilgoe, Owen, and Macnaghten (2013) is particularly useful in the context of the present paper. This framework echoes the notion of 'reflexivity failure' of Weber and Rohracher (2012) by highlighting our inability to control social change and properly govern the potential impacts of innovation. The authors suggest an alternative to backward-looking,

risk-assessment oriented approaches used in innovation policy to propose, instead, a series of reflexive, constructive and participatory ways of governing or 'modulating' innovation. For them, these would respond to our need for legitimacy and the enactment of shared responsibilities between different innovation actors. RRI can be operationalized through four key dimensions aimed to manage 'questions of uncertainty (in its multiple forms), purposes, motivations, social and political constitutions, trajectories and directions of innovation' (Stilgoe et al., 2013, p. 1570):

1. Anticipation: meaning our ability to consider the potential impacts (both positive and negative) of innovation and build capacity to respond to them (Guston, 2014);
2. Inclusion: extending participation in decision-making around innovation to publics who are typically excluded for not holding 'certified' knowledge (Jasanoff, 2003; Nowotny, 2000);
3. Reflexivity: the capacity of individuals and organizations to consider and be transparent regarding their own beliefs, interests and assumptions (Lynch, 2000), and
4. Responsiveness: how institutions and organizations and, ultimately, innovation (as a product of innovating actors within these institutions and organizations), responds to emerging knowledge, perspectives, views and norms (Stilgoe et al., 2013, p. 572).

These principles or dimensions have proven attractive to a range of policy-makers and academics, including innovation scholars that propose more normative policy perspectives (e.g. Schlaile et al., 2017; Tödtling & Trippl, 2018). To date, they have not been however articulated in the context of regional innovation policy (although see Fitjar, Benneworth, & Asheim, 2018).

Speaking back to this varied body of innovation literature, RRI seeks to address directionality, understood as the normative process of shaping innovation pathways in order to contribute to specific societal goals, through its concern with promoting institutional responsiveness (Stilgoe et al., 2013); 'modulating' innovation at the 'mid-stream' by shaping decision-making at the level of scientific and technological development (a process that takes place after funding and policy decisions, but before regulation) (Fisher, Mahajan, & Mitcham, 2006); and aligning innovation with societal needs (Ribeiro et al., 2018; see also Røpke, 2012, who discusses the environmental directionality of ICT-related innovations). RRI therefore entails a deeply normative component in a similar way to transformational and mission-orientated innovation policy approaches, in that it questions the objectives of innovation. By focussing on 'desirable' societal benefits and arguing for an extended poll of legitimate actors to influence policy-making and innovation processes, RRI taps into the issue of directionality and brings up the question of what kinds of public values are being fostered by innovation. In this sense, RRI is both an engine and a 'product' of innovation policies developed in the context of transitions and societal challenge-orientation (see section 2.1).

## 4. Focussing on demand-side policy: public procurement of innovation

Reflecting on the normative turn taken by the innovation policy narrative discussed in the sections above, there is a need to consider the role of demand in the creation of public value. Demand, particularly the potential of the public sector to effect social economic

and environmental change through public procurement, has been a neglected aspect—a 'sleeping giant' (Morgan, 2017)—of regional innovation policy. Despite some exceptions (Gee & Uyarra, 2013; Martin & Coenen, 2015), this literature has been silent on the role of public demand as a driver of regional transformation.

Public procurement is an example of a practice where responsible forms of innovation are needed and sometimes acted out, or performed. Public procurement is a process used to plan and organize public-private interactions that create or deliver the goods and services needed to achieve policy goals and deliver public value, including the promotion of healthy populations, sustainable development, and effective infrastructure.

Public procurement has been classed as a demand-side innovation policy instrument for some time, as the significant sums spent by governments through this channel represent significant economic leverage (Dale-Clough, 2015; Uyarra, Flanagan, Magro, & Zabala-Iturriagagoitia, 2017; Uyarra & Flanagan, 2010). The consideration of public procurement as an innovation policy instrument is a manifestation of the expansion of the realm of action in innovation policy associated with this normative turn as well as the 'deepening' of innovation policy (Borrás, 2009) to incorporate an ever-expanding set of instruments, including instruments that are intended to achieve other policy goals (such as procurement, regulation, education, tax measures, etc.). In this context, the idea that public procurement may be used to drive innovation (Edler & Georghiou, 2007) has become increasingly widespread amongst policy-makers and governments around the world. The justification for its use has also evolved over time reflecting the rationales discussed in section 2– a market failure rationale, a systemic framing, and now the search for a more holistic, reflective approach that links public procurement to broader socioe-conomic objectives and to social innovation.

The first wave of public procurement of innovation policy adopted a narrow view of innovation that valued radical innovation (buying a completely new technology) over the use of public procurement to facilitate the diffusion, adoption, and adaptation of innovations throughout society (Uyarra & Flanagan, 2010). This approach was rooted in the market failure tradition, and therefore did not systematically address the contestations, negotiations and compromises affecting innovation in practice. A more recent wave of research has applied endogenous institutional lenses to try to reconcile the potential to use public procurement as an instrument of innovation policy with the limitations and realpolitik of its regional and local practical settings (see e.g. Rolfstam, 2015). The contribution of this body of work was to demonstrate that when viewed as an embedded activity conducted by organizations in particular places and times (as opposed to a series of independent transactions), public procurement becomes a complex series of weightings and judgements between multiple policy objectives, including innovation, economic development, and social and environmental improvement, that compete for the attention of practitioners and where the overarching values of lowest cost, transactional and managerial efficiency still dominate decision-making and resource allocation (Erridge, 2007; Pickernell, Kay, Packham, & Miller, 2011). In sum, public procurement settings are characterized by competition between regulatory, commercial and socio-economic objectives (Erridge & McIlroy, 2002). How these tensions are dealt with depends on the local capabilities of policy makers in an already 'congested state' (Exworthy & Powell, 2004).

This contextual turn served to highlight the geographical stickiness of public procurement, since it 'both shapes and is shaped by actors that are strongly connected to a place' (Uyarra et al., 2017, p. 832). This is in contrast to the implicit narrative of earlier rationales, which considered that public procurement of innovation was something to be done on a large scale and with national interests in mind. Regional and local governments were deemed to lack the scale and capacity needed to drive innovation through public procurement, thus suggesting a division of labour between the national level, more suited to mission-oriented large-scale technology procurement, and the regional level, typically regarded as being focussed on 'low-tech', more mundane goods and services. Indeed, the objectives of innovation and regional development were seen as contradictory (Pickernell et al., 2011) and attempts to pursue more active local procurement have been criticized as wasteful and anti-competitive (What Works Centre for Local Economic Growth, 2018).

This neglect is surprising not least because a considerable share of public procurement is undertaken at subnational levels (Peck & Cabras, 2011; Pickernell et al., 2011). Local and regional governments, and other 'anchor organizations' like universities and hospitals (CLES, 2015), buy and deliver a significant share of goods and services in regions, a large proportion of which should reflect citizen and end user needs if we accept that the purpose of public procurement is to service and improve the wellbeing of local communities. Finally, regions can act as spaces of connection between lead users and innovators that can help address challenges of local and potentially later wider, perhaps even global, relevance (Dale-Clough, 2015).

The implications of these studies is that public procurement of innovation policy should not treat national and sub-national implementation as separate activities but should try to embed dialogue between levels and allocate resources and expertise according to emerging trajectories of demand. This argument has been adopted by those who link public procurement to the smart specialization policy agenda, which has emerged as a significant tool in regional innovation planning in Europe (Morgan, 2017). But the relative absence of frameworks to assess the non-financial costs and benefits of procuring innovation or articulate the long term needs of local populations in procurement strategies and decisions (Valovirta, 2015) means that despite these contextual and spatial arguments, public procurement regulation on the whole remains primarily concerned with technical, economic (allocative efficiency) and procedural performance (Bovis, 2017), and mechanisms for asking whether its outcomes are 'just, sustainable and good' are discretionary and applied ad-hoc. One such solution is articulated by Erridge, who cites the complex and contested goals and values of the public sector, Erridge (2007) as the basis for using the notion of 'public value' as the basis for assessing the use of procurement for socio-economic purposes. Value may be added through meaningful relations or 'conversations' (Uyarra et al., 2017) with suppliers, users, citizens, etc. This requires replacing a 'one-size-fits-all' perspective with one that 'assesses any potential provider according to their capacity to create value', which in turn demands greater leadership, capacity to listen to and work with citizens/local groups, and the ability to innovate (Kelly & Muers, 2002).

### 4.1. A value framework for public procurement

Policies that reflect this argument represent decision-making frameworks based on an ultimate value framework for generating economic, social and environmental benefits from a

single item of spending. One of the most clearly-articulated and successful of the policies that emerged at this time was the UK's Social Value Act introduced into UK legislation in 2012. Introduced as a private member's bill (championed and with the support Social Enterprise UK), the Social Value Act requires public authorities to explicitly consider the economic, social and environmental well-being aspects of public services contracts established through public procurement. It encourages local authorities to consider and define their own social values (ideally in consultation with local communities) and the ways in which these values can be translated into requirements that can be articulated and realized through the public procurement process. The Act can support innovation as a tool for achieving social value as procurement enables public bodies to direct and define new socially valuable solutions in collaboration with public and third sector actors. It is notable that the Act not only made it to legislation, but has also been recently extended and expanded from applying to contracts covering services over a certain threshold to now cover all public sector spending. Although outcome measurement challenges, risk aversion and consistency of policy application were identified in the review of the Act (Cabinet Office, 2015) as barriers to implementation, it was found that a third (33%) of councils in the UK are now routinely considering social value in their commissioning and procurement activity, and one in four (24%) had a social value policy in place. The outcomes reported include an increased use of public contracts to facilitate local training and apprenticeships; the inclusion of environmental considerations; support local businesses, charities and social enterprises; support to people with disabilities, to tackle homelessness, and reduce food waste, among others.

There is however, a broader political issue at the heart of the Social Value Act. Pressured by local government budget cuts in the last decade, local authorities in England have been forced to deliver cost savings while addressing the social and economic impact of the recession. At the same time, the tendency to aggregate and consolidate procurement into large national contracts has reduced capacity for local action to capture some of the value of the goods and services procured locally or to use alternative providers or co-produce innovation with local users and suppliers. The Social Value Act, with its requirement to ensure social, economic and environmental benefits within the administrative territory of the relevant purchasing authority, could be considered a reaction to a broader political-economic situation, in which the scope and resources of local government to operate as strategic planning authorities are shifting.

For example, implementation by Greater Manchester authorities (considered one of the leading examples of social value procurement) linked procurement to economic, social and environmental priorities that reflect the Greater Manchester Strategy 'Stronger Together', including employment and economic sustainability, raising living standards, promoting equity and fairness and environmental sustainability. These objectives are articulated to bidders in tender documents so that they can provide tender responses that deliver social value as defined by actors in the city-region. Responses to tenders are evaluated not just on the basis of quality but also significantly on the extent to which they make a demonstrable contribution to social value outcomes. Here we see public procurement being conceptualized as a tool of regional planning and strategy implementation. Innovation is embedded in the processes used to implement the policy: potential suppliers are encouraged to engage in conversations with users and voluntary sectors early-on in the bidding process so they can respond to tenders with more innovative

and competitive proposals. They are encouraged to involve members of the community which might be 'harder to reach', such as minority groups, to identify unmet needs and develop ideas about how they can enhance their opportunities and contribute to improving their standard of living. Subsequently, innovation is framed by local needs and ideally shaped by regional institutions and actors. Although organizational changes and changes to the social value in procurement policy are on-going in the UK, frameworks motivated by the Social Value Act represent efforts towards aligning innovation and societal challenges. While this goal already resonates with those of the RRI agenda, these frameworks have also an intrinsic connection to the local context and make explicit the need for creating public value from government's investments in both mundane technologies, and different forms of innovation, including social innovation.

## 5. Conclusion: innovation, public procurement and responsibility

There are interesting points of cross-fertilisation between RRI, public procurement and regional innovation policy which help us understand the potential to overcome the spatial blindness of new innovation policy rationales and promote responsibility in a new context of regional development. Applying the principles of RRI prompts the questions of *how* and *by whom* 'public value' is being defined; *how* 'societal challenges' are being framed; what kinds of solutions are proposed and by whom, and *what* is the rationale behind choosing certain innovations to address these challenges over others. Public procurement, in its strategies, specifications, procurer-supplier interactions and weighted decision-making frameworks offers a very practical stage for answering these questions that represent a gap in the innovation systems and RRI literature. Public procurement policy in turn becomes a matter of deciding which capabilities must be developed to instil more democratic and inclusive forms of innovation and sociotechnical system configurations capable of bringing about transformative change.

Using RRI as 'critical' lens, we propose a series of elements that we believe position public procurement of innovation as a form of transformative place-based innovation policy. We can link the four principles of RRI defined above (Stilgoe et al., 2013) to different phases of the public procurement process (see Table 1).

What is clear from Table 1 is that further integration of regional innovation policy frameworks, instruments like public procurement, and RRI requires a clearer conceptualization of public value. Public value is an idea that is overlooked in the RRI discourse, with a few exceptions (see e.g. Hartley, Alford, Knies, & Douglas, 2017), only superficially addressed by the literatures in sections 2.1 and 2.2 and under-addressed in its application through procurement polict like the Social Value Act. Similarly to the approach outlined in Table 1, Erridge (2007) considers that the true value of public procurement comes through a greater emphasis on public consultation in the procurement process (anticipation, reflectivity) and the broader impacts and outcomes possible through procurement (reflection and responsiveness). The notion of public value also provides some of the necessary directionality and context-specificity for regional innovation policy. This overarching concept encompasses questions of responsibility, leadership and collaborative governance, and could be used to orient policy around the generation of social utility or public benefits by goods and services, which are in turn considered being of worth to society to fulfil its functions. A prominent theorist in the field of research and

**Table 1.** Public procurement seen through the RRI lens.

| RRI lens | Procurement as transformation |
|---|---|
| **Anticipating** alternative, multiple scenarios, and potential impacts (+ve /-ve) of innovation. | Integrating (multiple) local conversations when assessing needs, designing services, strategic planning and using a range of foresight, visioning and predictive tools. |
| **Including** diverse actors (esp. typically excluded publics) | Integrating multiple actor communities (service users, community and non-incumbent suppliers) in pre-procurement engagement; using outcome-based specifications and weighting; considering whose values are typically included and may be excluded. |
| **Reflecting**: transparency regarding assumptions, concerns and values of the different actors | Integrating service users, community and non-incumbent suppliers in procurement strategies and evaluating goods/services. Taking account of the concerns of the different actors involved (affected and/or interested) in the process, and understanding their values and what social value means for them. Develop monitoring and evaluation frameworks. |
| **Responding**: addressing global and local societal challenges and needs (technological and social innovation that produces 'change') | Local framing and contextualization of societal challenges; deciding to generate / deliver social value (and what it means in practice), and defining the capabilities needed to foster / support innovation adoption, diffusion and distribution for people to enjoy any benefits created. |

science policy evaluation, Bozeman (2007) defines public values as a set of values that provide normative consensus about the rights and benefits to which citizens are entitled, the obligations of citizens to society and the principles that should guide government policies (Ibid: 17).

However despite a recent increase in popularity of the concept of public value, empirical verification of the limits of this concept is rare (Hartley et al., 2017). While considering that the government has a key role to play in creating public value, it does not own all of the processes and institutions that have public value potential or obligations (Bryson, Crosby, & Bloomberg, 2014). Bryson et al. (2014) also acknowledge the danger of it being used as a rhetorical device, but argue that, besides a performative role for the measurement and management of investment decisions, it can provide greater focus and a confluence of debates about 'values, institutions, systems, processes and people' (Smith, 2004, p. 68), and a narrative capable ofintegrating seemingly unrelated or contradictory dimensions of public decision making. Public value can therefore help us address the contested elements within societal challenges by acting as a guiding principle for innovation policy, and underpinning the essential contribution of processes like public procurement that translate societal needs into private business practices using perfomative administrative processes.

An important question for RRI scholars will be how public value is *performed* within specific systems and by specific actors, e.g. the science policy system, public management organizations. Public value should not be understood as being universal, but as representing the values and concerns of those actors and institutions deemed responsible for defining them. In the same vein, what come to constitute 'societal challenges' are imagined states of affairs which allude to the notion of a 'general public', as representative of society, and a list of concerns this public is thought to hold. As another layer to their deeply normative dimension, these terms are also dependent on geographies and are shaped by regional and local policy. Highlighting an earlier point made in the paper, neither RRI, nor innovation policy for transformative change should remain at the rhetorical level,

for they risk being 'words that succeed but policies that fail' (Exworthy & Powell, 2004). What the case of public procurement policy shows is that focussing on local needs and defining those needs in processes that are as bottom-up as possible is one of the way of creating public value. In this paper, we have revisited the evolving debates in innovation policy, and documented an increasing dissatisfaction amongst scholars with existing policy models, perceived as unable to tackle with so-called 'grand challenges' but also economic restructuring and territorial disparities. This inevitably requires innovation scholars to consider not just questions of how and how much innovation, but also what, why and for whom: namely the problems of directionality, legitimacy and responsibility. This shifts the debates on rationales for intervention from market and system failures to more transformative perpsectives that also accommodate other approaches rooted in the notion of public value.

We brought together three relatively disconnected strands of literature, namely responsible research and innovation, challenge and demand-oriented innovation policy approaches, evolutionary economic geography and place-based economic development approaches and put forward an initial, tentative framework, that brings together points for reflection in the context of these evolving narratives and that aims to address the shortcomings of existing debates, namely the lack of spatial sensitivity of challenge or goal-oriented innovation policies and transition studies, and the lack of attention of regional innovation scholars to strategic or deliberate state action, particularly on the demand side, shaping path creation and development. In so doing so, we sought a) to restate the importance of places in pursuing societal challenges and the need for a more active government intervention to promote new and more inclusive development paths; and b) to reflect on a number of dimensions which can support the increase of fairness, transparency, responsibility and the creation of public value.

Our approach also contributes to the RRI debate by situating it as a broader tool for informing the role of the public sector. Whilst RRI has emerged as a strong policy-prescription for more normative approaches to innovation, we argue that current applications of RRI would benefit from broadening its scope in two ways. Firstly, by deepening its focus on creating public value in alignment to developments in regional innovation policy; secondly, in moving beyond emerging technologies to consider the modulation of more 'mundane' innovations (including social innovations), particularly in the context of place-based innovation policies. In doing so, RRI must become more sensitive to different geographies and deliver on spatially-aware, responsive innovation policy. The potential for a truly place-based RRI which is conducive to transformative change (understood in terms of delivering public value at the local and regional levels) is something which remains unclear at this point, but it is worth being further explored empirically and theoretically. We argue that deployed as a critical lens, RRI should extend its focus to regional innovation policy with a view to shedding light on its normative aspects. This means looking at regional innovation policies of as socially-constructed processes and interrogating the hidden assumptions we may have regarding the meaning of key pervasive constructs such as 'public value' and 'societal challenges' and the values and concerns held by those deemed responsible for defining these constructs. This kind of lens can help magnify and explore 'granulated' realities, in contrast to the more typical 'birds eye view' of conventional innovation policy studies approaches.

We believe that by reflecting more comprehensively on the innovation aspect of public procurement of innovation using tools like RRI, we can both significantly improve our understanding of the contexts in which it is more and less likely to be useful (and eventually support practitioners) and re-situate the debates within debates about public administration, public value, and public policy which will enable more critical, theoretical and context-sensitive critiques of this innovation policy instrument in action.

## Note

1. https://ec.europa.eu/info/eu-regional-and-urban-development/topics/cities-and-urban-development/priority-themes/innovative-and-responsible-public-procurement-cities_en

## Acknowledgements

Ribeiro acknowledges support from the Biotechnology and Biological Sciences Research Council [grant number BB/M017702/1] (Manchester Synthetic Biology Research Centre for Fine and Speciality Chemicals).

## Disclosure statement

No potential conflict of interest was reported by the authors.

## ORCID

*Elvira Uyarra* http://orcid.org/0000-0003-3144-1741
*Barbara Ribeiro* http://orcid.org/0000-0002-5230-1695

## References

Bailey, D., Pitelis, C., & Tomlinson, P. R. (2018). A place-based developmental regional industrial strategy for sustainable capture of co-created value. *Cambridge Journal of Economics*, *42*(6), 1521–1542. doi:10.1093/cje/bey019

Balmer, A. S., Calvert, J., Marris, C., Molyneux-Hodgson, S., Frow, E., Kearnes, M., … Martin, P. (2016). Five rules of thumb for post-ELSI interdisciplinary collaborations. *Journal of Responsible Innovation*, *3*(1), 73–80. doi:10.1080/23299460.2016.1177867

Barca, F. (2009). *Agenda for a reformed cohesion policy*. Brussels: European Communities.

Boon, W., & Edler, J. (2018). Demand, challenges and innovation. Making sense of new trends in innovation policy. Science and Public Policy, *45*(4), 435–447.

Borrás, S. (2009). "The Widening and Deepening of Innovation Policy: What Conditions Provide for Effective Governance?" *CIRCLE Working Paper*2009/02.

Boschma, R., & Frenken, K. (2011). The emerging empirics of evolutionary economic geography. *Journal of Economic Geography*, *11*(2), 295–307. doi:10.1093/jeg/lbq053

Bovis, C. H. (2017). Public procurement as economic or policy exercise. *European Procurement & Public Private Partnership Law Review*, *12*(3), 213. doi:10.21552/epppl/2017/3/3

Bozeman, B. (2002). Public value failure: When efficient markets may not do. *Public Adm. Rev*, *62*, 145–161. doi:10.1111/0033-3352.00165

Bozeman, B. (2007). *Public values and public interest: Counterbalancing economic individualism*. Washington, D.C.: Georgetown University Press.

Bryson, J. M., Crosby, B. C., & Bloomberg, L. (2014). Public value governance: Moving beyond traditional public administration and the new public management. *Public Administration Review*, *74*(4), 445–456. doi:10.1111/puar.12238

Cabinet Office. (2015). Social Value Act Review, 15 February 2015. Retrieved from https://www.gov.uk/government/consultations/social-value-act-review
Castaldi, C., Frenken, K., & Los, B. (2015). Related variety, unrelated variety and technological breakthroughs: An analysis of US state-level patenting. *Regional Studies*, *49*(5), 767–781.
CLES. (2015). *Creating a good local economy. The role of anchor institutions*. Manchester: Centre for Local Economic Strategy.
Coenen, L., Hansen, T., & Rekers, J. V. (2015). Innovation policy for grand challenges. An economic geography perspective. *Geography Compass*, *9*, 483–496. doi:10.1111/gec3.12231
Crevoisier, O., & Jeannerat, H. (2009). Territorial knowledge dynamics: From the proximity paradigm to multi-location milieus. *European Planning Studies*, *17*(8), 1223–1241.
Dale-Clough, L. (2015). Public procurement of innovation and local authority procurement: Procurement modes and framework conditions in three European cities. *Innovation: The European Journal of Social Science Research*, *28*(3), 220–242. doi:10.1080/13511610.2015.1012709
Eder, J. (2018). Innovation in the periphery: A critical survey and research agenda. *International Regional Science Review*, *42*(2), 119–146. doi:10.1177/0160017618764279
Edler, J., & Fagerberg, J. (2017). Innovation policy: What, why, and how? *Oxford Review of Economic Policy*, *33*(1), 2–23. doi:10.1093/oxrep/grx001
Edler, J., & Georghiou, L. (2007). Public procurement and innovation—resurrecting the demand side. *Research Policy*, *36*(7), 949–963. doi:10.1016/j.respol.2007.03.003
Erridge, A. (2007). Public procurement, public value and the Northern Ireland unemployment pilot project. *Public Administration*, *85*(4), 1023–1043. doi:10.1111/j.1467-9299.2007.00674.x
Erridge, A., & McIlroy, J. (2002). Public procurement and supply management strategies. *Public Policy and Administration*, *17*(1), 52–71. doi:10.1177/095207670201700105
European Commission. (2014). Rome Declaration on Responsible Research and Innovation in Europe. Retrieved from https://ec.europa.eu/research/swafs/pdf/rome_declaration_RRI_final_21_November.pdf
Exworthy, M., & Powell, M. (2004). Big windows and little windows: Implementation in the 'congested state'. *Public Administration*, *82*(2), 263–281. doi:10.1111/j.0033-3298.2004.00394.x
Feldman, M., Hadjimichael, T., Lanahan, L., & Kemeny, T. (2016). The logic of economic development: A definition and model for investment. *Environment and Planning C: Government and Policy*, *34*(1), 5–21. doi:10.1177/0263774X15614653
Feldman, M., & Lowe, N. (2018). Policy and collective action in place. *Cambridge Journal of Regions, Economy and Society*, *11*(2), 335–351. doi:10.1093/cjres/rsy011
Fisher, E., Mahajan, R. L., & Mitcham, C. (2006). Midstream modulation of technology: Governance from within. *Bulletin of Science, Technology & Society*, *26*(6), 485–496. doi:10.1177/0270467606295402
Fitjar, R., Benneworth, P., & Asheim, P. (2018). Towards Regional Responsible Research and Innovation? Paper presented at the Regional Innovation Policies Conference, Bergen, Nov 2018.
Frenken, K. (2017). A complexity-theoretic perspective on innovation policy. *Complexity, Innovation and Policy* (Special Issue), *3*(1), 35–47.
Gee, S., & Uyarra, E. (2013). A role for public procurement in system innovation: The transformation of the Greater Manchester (UK) waste system. *Technology Analysis & Strategic Management*, *25*(10), 1175–1188. doi:10.1080/09537325.2013.843660
Georghiou, L., Edler, J., Uyarra, E., & Yeow, J. (2014). Policy instruments for public procurement of innovation: Choice, design and assessment. *Technological Forecasting & Social Change*, *86*, 1–12. doi:10.1016/j.techfore.2013.09.018
Guston, D. H. (2014). Understanding "anticipatory governance". *Social Studies of Science*, *44*(2), 218–242. doi:10.1177/0306312713508669
Hartley, J., Alford, J., Knies, E., & Douglas, S. (2017). Towards an empirical research agenda for public value theory. *Public Management Review*, *19*(5), 670–685. doi:10.1080/14719037.2016.1192166
Hartmann, D. (2014). *Economic complexity and human development*. London: Routledge.

Horvat, M. (2011). The new framework for EU research and innovation. *Science*, *334*(November 2011), 1066–1068. doi:10.1126/science.1214295

Iammarino, S., Rodríguez-Pose, A., & Storper, M. (2018). Regional inequality in Europe: Evidence, theory and policy implications. *Journal of Economic Geography*, *19*(2), 273–298.

Janssen, M. (2015). Cross-specialization and structural holes: The case of the Dutch Topsectors. *Papers in Evolutionary Economic Geography*, *15*, 19.

Jasanoff, S. (2003). Technologies of humility: Citizen participation in governing science. *Minerva*, *41*, 233–244. doi:10.1023/A:1025557512320

Jeannerat, H., & Crevoisier, O. (2016). Editorial: From "territorial innovation models" to "territorial knowledge dynamics": On the learning value of a new concept in regional studies. *Regional Studies*, *50*, 185–188. doi:10.1080/00343404.2015.1105653

Kelly, G., & Muers, S. (2002). *Creating public value*. London: Cabinet Office, Strategy Unit.

Kogler, D. F. (2015). Evolutionary economic geography–theoretical and empirical progress. *Regional Studies*, *49*(5), 705–711. doi:10.1080/00343404.2015.1033178

Lynch, M. (2000). Against reflexivity. *Theory, Culture and Society*, *17*(13), 26–54. doi:10.1177/02632760022051202

Marris, C. (2015). The construction of imaginaries of the public as a threat to synthetic biology. *Science as Culture*, *24*(1), 83–98. doi:10.1080/09505431.2014.986320

Martin, H., & Coenen, L. (2015). Institutional context and cluster emergence: The biogas industry in Southern Sweden. *European Planning Studies*, *23*(10), 2009–2027. doi:10.1080/09654313.2014.960181

Mazzucato, M. (2013). *The entrepreneurial state: Debunking private vs. public sector myths*. London: Anthem Press.

Mazzucato, M. (2018a). *The value of everything: Making and taking in the global economy*. London: Penguin Books UK.

Mazzucato, M. (2018b). *Mission-oriented research & innovation in the European Union. A problem-solving approach to fuel innovation-led growth*. Brussels: European Commission.

McLeod, C., & Nerlich, B. (2017). Synthetic biology, metaphors and responsibility. *Life Sciences, Society and Policy*, *13*(1). doi:10.1186/s40504-017-0061-y

Morgan, K. (2013). Path dependence and the state. In P. Cooke (Ed.), *Re-framing regional development: evolution, innovation, and transition* (pp. 318–340). London: Routledge.

Morgan, K. (2017). Nurturing novelty: Regional innovation policy in the age of smart specialisation. *Environment and Planning C: Government and Policy*, *35*(4), 569–583.

Nowotny, H. (2000). Transgressive competence: The narrative of expertise. *European Journal of Social Theory*, *3*(1), 5–21.

OECD. (2011). Fostering Innovation to Address Social Challenges. Proceedings of the CSTP Expert Workshop on Fostering Innovation to address Social Challenges, pp. 1–99. Retrieved from https://www.oecd.org/sti/inno/47861327.pdf

Peck, F., & Cabras, I. (2011). The impact of local authority procurement on local economies: The case of Cumbria. *North West England. Public Policy and Administration*, *26*(3), 307–331. doi:10.1177/0952076709356859

Phelps, N. A., Atienza, M., & Arias, M. (2018). An invitation to the dark side of economic geography. *Environment and Planning A: Economy and Space*, *50*(1), 236–244. doi:10.1177/0308518X17739007

Pickernell, D., Kay, A., Packham, G., & Miller, C. (2011). Competing agendas in public procurement: An empirical analysis of opportunities and limits in the UK for SMEs. *Environment and Planning C: Government and Policy*, *29*(4), 641–658. doi:10.1068/c10164b

Ribeiro, B., Bengtsson, L., Benneworth, P., Bührer, S., Castro-Martínez, E., Hansen, M., … Shapira, P. (2018). Introducing the dilemma of societal alignment for inclusive and responsible research and innovation. *Journal of Responsible Innovation*, *5*(3), 316–331. doi:10.1080/23299460.2018.1495033

Ribeiro, B., Smith, R., & Millar, K. (2017). A mobilising concept? Unpacking academic representations of responsible research and innovation. *Science and Engineering Ethics*, *23*(1), 81–103. doi:10.1007/s11948-016-9761-6

Rip, A. (2014). The past and future of RRI. *Life Sciences Society and Policy*, *10*(1), 17. doi:10.1186/s40504-014-0017-4

Rodríguez-Pose, A. (2018). The revenge of the places that don't matter (and what to do about it). *Cambridge Journal of Regions, Economy and Society*, *11*(1), 189–209.

Rolfstam, M. (2015). Public procurement of innovation for a better world: A consolidation or a new beginning? *Innovation: The European Journal of Social Science Research*, *28*(3), 211–219. doi:10.1080/13511610.2015.1065139

Røpke, I. (2012). The unsustainable directionality of innovation - The example of the broadband transition. *Res. Policy*, *41*, 1631–1642. doi:10.1016/j.respol.2012.04.002

Schlaile, M. P., Urmetzer, S., Blok, V., Andersen, A. D., Timmermans, J., Mueller, M., … Pyka, A. (2017). Innovation systems for transformations towards sustainability? Taking the normative dimension seriously. Sustainability, *9*(12), 2253.

Schot, J., & Steinmueller, W. E. (2018). Three frames for innovation policy: R&D, systems of innovation and transformative change. *Research Policy*, *47*(9), 1554–1567. doi:10.1016/j.respol.2018.08.011

Sen, A. (1999). *Commodities and capabilities*. Oxford: Oxford University Press.

Smith, R. F. I. (2004). Focusing on public value: Something new and something old. *Australian Journal of Public Administration*, *63*(4), 68–79. doi:10.1111/j.1467-8500.2004.00403.x

Stilgoe, J. (2016). Geoengineering as collective experimentation. *Science and Engineering Ethics*, *22*(3), 851–869. doi:10.1007/s11948-015-9646-0

Stilgoe, J., Owen, R., & Macnaghten, P. (2013). Developing a framework for responsible innovation. *Research Policy*, *42*, 1568–1580. doi:10.1016/j.respol.2013.05.008

Tödtling, F., & Trippl, M. (2018). Regional innovation policies for new path development–beyond neo-liberal and traditional systemic views. *European Planning Studies*, *26*(9), 1779–1795.

Uyarra, E., & Flanagan, K. (2010). Understanding the innovation impacts of public procurement. *European Planning Studies*, *18*(1), 123–143. doi:10.1080/09654310903343567

Uyarra, E., Flanagan, K., Magro, E., & Zabala-Iturriagagoitia, J. M. (2017). Anchoring the innovation impacts of public procurement to place: The role of conversations. *Environment and Planning C: Politics and Space*, *35*(5), 828–848. doi:10.1177/2399654417694620

Valovirta, V. (2015). Building capacity for public procurement of innovation. In C. Edquist, N. Vonortas, J. M. Zabala-Iturriagagoitia, & J. Edler (Eds.), *Public procurement for innovation* (pp. 65–86). Cheltenham and Northampton, MA: Edward Elgar Publishing.

von Schomberg, R. (2011). Prospects for technology assessment in a framework of responsible research and innovation'. In M. Dusseldorp & R. Beecroft (Eds.), *Technikfolgen abschätzen lehren. Bildungspotenziale transdisziplinärer Methoden* (pp. 39–61). Springer.

Wanzenböck, I., & Frenken, K. (2018). The subsidiarity principle: Turning challenge-oriented innovation policy on its head (No. 1806). Utrecht University, Department of Human Geography and Spatial Planning, Group Economic Geography.

Weber, K. M., & Rohracher, H. (2012). Legitimizing research, technology and innovation policies for transformative change: Combining insights from innovation systems and multi-level perspective in a comprehensive "failures" framework. *Research Policy*, *41*, 1037–1047. doi:10.1016/j.respol.2011.10.015

What Works Centre For Local Economic Growth. (2018). Local procurement. Retrieved from http://www.whatworksgrowth.org/public/files/18-05-03_Local_Procurement_v4.pdf

Woolthuis, R. K., Lankhuizen, M., & Gilsing, V. (2005). A system failure framework for innovation policy design. *Technovation*, *25*(6), 609–619. doi:10.1016/j.technovation.2003.11.002