

Can public procurement aid the implementation of smart specialization strategies?

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Abstract

In recent decades sub-national regions have become ever more important as spaces for policy making. The current focus on research and innovation for smart specialisation strategies is the latest manifestation of this trend. By putting PPI processes at the core of regional and local development initiatives to support innovation, governments can go beyond priority setting to become active stakeholders engaged in entrepreneurial discovery processes. In this paper we offer a new conceptualization of how such smart specialisation strategies, as an example of a sub-national innovation policy, can help articulate demand for innovation.

The paper presents an evolutionary framework that relates regional specialisation processes with the scale and scope of the demand associated to that specialisation. We identify four different roles for governments to be played, depending on the availability of local capabilities and the scale of the chosen priorities: government as a lead user, government as an innovation catalyst, government as an entrepreneur, and government as a broker. This framework is illustrated through three case studies, two in Spain (Basque Country and Galicia) and another in Sweden (Malmö).

Keywords: Public Procurement for Innovation; Smart Specialisation Strategies; Anchoring procurement; Bundling.

1.- Introduction

The role of regions as policy making spaces (Uyarra and Flanagan 2010) has grown since the 1990s when the European Commission started promoting regional innovation policy making processes across the EU through supporting the implementation of a battery of programs such as the RIS, RTP, RIS+, etc. (Zabala-Iturriagagoitia et al. 2008). The most recent initiative is the Research and Innovation for Smart Specialisation Strategies (RIS3) programme (European Commission 2011). The aim of RIS3 is to help regions to diversify their economies based on their regional assets, to avoid duplication of priorities and help increase the potential for complementarities across the European knowledge base (Foray et al. 2009, p. 20).

A new governance model is set up by RIS3. The model envisages the building of interactive governance processes and structures, in which all relevant regional stakeholders can participate, in order to define and design the content of the policy (in this case, the areas of specialisation) (see Aranguren et al. 2016a). Public bodies can thus play an important role not only in setting priorities but also in assisting and strengthening the creation of connections among regional stakeholders. RIS3 provides an example of the mobilization of regional capabilities aiming at the articulation of demand and the definition of directions for the region.¹ Public policy actors play a moderating role among all kinds of societal stakeholders in the definition of long term political goals through entrepreneurial discovery processes.

As Boon and Edler (2017) state in the introductory paper to this special issue, “challenge policies often focus on orchestrating and directing research, development and innovation efforts towards desired outcomes, on linking capabilities of different, traditionally separated areas”. RIS3 does not only aim to provide directionality to innovation promotion activities at the sub-national level, but aims also to link these with existing research and development (R&D), science and technology (S&T) capabilities, and to derive a set of key strategic sectors/areas/domains for the development and sustainability of regional socio-economic goals.

In this paper we conceptualize the roles that governments can play in the articulation of demand (i.e. the creation and diffusion of innovations) within RIS3, as an example of a sub-national innovation policy. With it we aim to contribute to one of the main purposes of this special issue, namely, how demand plays a role in the context of directionality. One of the main objectives of demand-side interventions is to increase the demand for innovations, to improve the conditions for the uptake of innovations and to improve the articulation of demand (Edler and Georghiou 2007, p. 952). Demand subsidies, demand tax incentives, awareness measures, labels, information campaigns, demonstration projects, support of user-producer interaction, support of user-driven innovation, regulations (e.g. standards), public procurement (i.e. R&D procurement and innovation procurement), and systemic policies (e.g. cluster policies) are some examples of demand-side innovation policy instruments (Edler and Georghiou 2007).

¹ Following Boon and Edler (2017, this issue), demand articulation is understood as the “political process [by which] societal demands are defined or when demand for certain products or series is supported through state action”. In our case, the state would include not only the national level, but also the sub-national one (i.e. regional and local).

Innovation-oriented public procurement (PPI) has become a fashionable policy instrument for STI policy. First, and to the extent that something new is purchased, there is the notion that public procurement may provide a 'lead customer' or a 'lead market' for an innovative product/service/process (European Commission 2007). Besides making large purchases of new technologies or products at early stages in their development, such 'lead customers' also make substantial economic gains by adopting those innovations that are ahead of the current demands of the market (von Hippel 1986). Procurement contracts also act as an incentive for developers of new technologies, not all of whom may receive support from traditional R&D funding subsidies. Procurement may 'legitimize' product standards, creating new markets or expanding existing ones, and thereby ease adoption and diffusion. In other words, procurement can accelerate both technological improvements and their technological adoption in the overall economy. As well as the previous purposes, procurement can have a significant role in supporting the creation of an innovation-friendly climate, creating the conditions for the emergence, diffusion and uptake of innovations that may foster the dynamic formation of new markets and their further development thereof (Li and Georgiou 2016).

The RIS3 Guide highlights PPI as one of the instruments for regions to be included in the policy-mix when implementing RIS3 (European Commission 2012). However, the RIS3 guide does not reflect on the link between the two concepts. This paper aims to address this particular gap. We provide an evolutionary framework that links aspects of regional specialisation such as capabilities, skills and technologies with the scale and scope of the demand associated to that specialisation, such as local demand and diffusion potential. In the manuscript, the RIS3 framework is used as one means to conceptualise regional innovation policy. However, quite notably, it is not the only one. Hence, the RIS3 approach constitutes the conceptual lens through which we discuss the opportunities that PPI can deliver at sub-national levels, by overcoming certain failures and facilitating territorial evolutionary paths.

At the scholarly level, we aim to advance our understanding of spatial aspects of PPI, as claimed by Pickernell et al. (2011) and Uyarra et al. (2017), providing a conceptual link between smart specialisation, or any other sub-national policy initiative aiming to foster innovation, with demand side interventions. With it we intend to discuss the extent to which public procurement can be used for higher order political purposes, such as local and regional innovation strategy formulation. At the practitioner level, we aim to provide local policy makers with a roadmap (Morlacchi and Martin 2009; Wagenaar 2011), offering different scenarios on how territories could further use PPI for regional development. This framework allows policy makers to analyse the multiple dynamic paths science, technology and innovation (STI) policies can follow. With this framework we aim to provide governments with a tool that helps them to make a leap from representing the world, and understanding the key factors shaping it, to being able to intervene on it (ibid, p. 364). Given the different settings and structural properties of territories, and hence, due to the different roles STI policies play in mitigating the various possible failures in them, this paper contributes to the emerging literature on policy geographies (Pickernell et al. 2011; Uyarra et al. 2017), in which territories are increasingly being regarded as policy making spaces with different evolutionary patterns.

In agreement with Knuttson and Thomasson (2014), who suggest that sub-national authorities may play a pivotal role in triggering innovative solutions, we also believe cities and regions can be spaces for experimentation and development of niche innovations (see also Hodson and Marvin 2010), and therefore their relevance should not be underestimated nor underexplored. In this regard, the experiences posed by RIS3 in most European regions set a solid ground for experimentation, conceptualization and discussion. By putting PPI processes at the core of RIS3-like regional and local development initiatives the role of the state (in the context of this paper the role of sub-national governmental bodies) can change from being stakeholders engaged in regional priority setting to becoming active stakeholders also engaged in entrepreneurial discovery processes.

We demonstrate the multiple roles governments can play by using PPI to nurture and further develop demand with three cases studies, two from Spain (Basque Country and Galicia) and one from Sweden (Malmö). The reason for focusing on these three cases lies in their experience in the articulation of local development initiatives based on PPI, and its relationship with the further development of innovation and entrepreneurship activities, which are at the core of the implementation of a RIS3. These three sub-national cases help us illustrate the multiple scenarios and possible itineraries that can emerge through the link between the domains of specialisation and the scale of the demand associated to the PPI. The framework introduced in this paper allows for a dynamic understanding of sub-national innovation strategies, and the role that PPI can play in such a dynamic environment. We understand here the sub-national level as a “dynamic adoption space” (Ulacnlar et al. 2013, p. 98), defined as spatial and temporal spaces transcending organizational and geographic boundaries where attitudes, practices, interactions and events, together with the features of policy processes shape the perceptions of the different actors engaged in the definition and implementation of territorial strategies.

The remainder of the paper is structured as follows: Section 2 discusses the rationale, the process and the challenges associated to local and regional development strategies, focusing in particular on the relevance of RIS3, and the potential role that PPI can play in these. Section 3 introduces the rationale of PPI-based policies, and evidences how this policy instrument can be related to the development of local and regional development activities. Section 4 presents the framework we introduce in the paper as a result of the relationship between PPI and the implementation of sub-national innovation strategies. Section 5 characterises the three cases under study, and discusses how they illustrate the scenarios outlined in the previous section. Finally, Section 6 draws conclusions and implications.

2.- The concept of Smart Specialisation Strategies and its singularities

The idea of regional innovation policies has become increasingly important in Europe over the last two decades, encouraged by devolution processes and the rise of spatial innovation approaches in the literature (European Commission 2001). Indeed, systemic innovation approaches developed in the 1990s have been highly influential on innovation policy thinking (see Weber and Rohracher 2012). Thus, we have witnessed a shift from spatially blind innovation policies to place-based innovation policies, both in

theory and in practice (Barca et al. 2012). As Hajer and Wagenaar (2003) discuss the topography of policy-making has changed with the emergence of new spaces for policy design and formulation. They talk about policies being as a “matrouchka” (p. 8) in which lower levels of government fit in higher ones (in Arrona 2017).

Recently, Research and Innovation for Smart Specialisation Strategies (RIS3), as they have been spread by the European Commission, have become a major feature of the innovation policy agenda for Europe’s regions, becoming an important part of current regional policy thinking (Foray 2013; Thissen et al. 2013; Kroll 2015; McCann 2015). They represent a shift in regional innovation policy thinking away from the previously predominant regional innovation systems approach (Cooke et al. 1997) towards a view more rooted in industrial policy thinking (Rodrik 2004). RIS3 are defined as follows (European Commission 2011, p. 7 – emphasis ours):

*“smart specialisation is about placing greater emphasis on innovation and having an **innovation-driven development strategy** in place that focuses on each region’s **strength** and **competitive advantage**. It is about **specialising** in a smart way, i.e. based on **evidence** and **strategic intelligence** about a region’s **assets** and the **capability to learn** what specialisations can be **developed** in relation to those of other regions”.*

The RIS3 approach aims to encourage regional actors to move away from setting obvious but perhaps unrealistic high-tech priorities and ‘picking the same winners’, towards a strategy focused on identifying distinctive specialisation paths, building on regional capabilities and strengths.² The novelty of these strategies relies on two issues that might be seen as interconnected (Aranguren et al. 2016a). The first is that they are strategies which go beyond the policy landscape. RIS3 follow the strategic principle of making choices, and take into account territorial strategic views from various stakeholders, rather than only those of public policy actors. In this regard, RIS3 may be considered a challenge and/or mission oriented innovation policy (Chiang 1991), since the starting point is given by the selection of the societal (i.e. grand) challenges to be tackled.³ As noted, this new approach shifts from previous ones based on functional and systemic rationales, and emphasizes the importance of setting vertical and horizontal priorities.⁴ This decision making process should not however follow traditional top-down processes, but rather processes led by broad participation of a wide diversity of actors that lead to an inclusive agenda. In this view, territorial strategy is largely a question of prioritisation that builds on territorial strengths (Foray 2015), where both the content and the process of prioritisation are important.

With regard to the content, each region should prioritise activities in which to specialise. Activities are understood in a broad sense: priorities might be specific industries or

² The uptake of the approach has been driven by the fact that regions have had to adopt a smart specialisation strategy in order to access European structural funds.

³ Note that mission-oriented policies and policies oriented towards grand challenges are not necessarily the same (e.g. defence policies are mission-oriented but not oriented to grand challenges).

⁴ Previous policy-led approaches focused on diagnosing and tackling either market or systemic failures (Smith 2000; Smits and Kuhlmann 2004; Howlett et al. 2009; Wieczorek and Hekkert 2012) whereas RIS3 envisage a strategic approach to building territorial competitiveness by reinforcing regional capabilities and assets.

technologies, perhaps in combination with markets. Whatever the focus, this represents a 'verticalization' of priority-setting, in line with 'new industrial policies' (Rodrik 2004) or 'new mission-oriented policies' (Gassler et al. 2008). As for process, *how* best to set these priorities has been a key challenge, and remains controversial (Foray 2013). It is argued that, in order to cope with such complex questions as prioritising the domains that build the future of a territory based on local strengths and capabilities, public policy actors should not dominate but rather catalyse processes in which private actors also have real influence. The entrepreneurial discovery process, reflecting its roots in Rodrik's arguments, places discovery in the private-public sector nexus: activities should be 'discovered' in a territorial process that includes both public and private actors. Such a process can be considered a 'black box', implying a new governance model in regional innovation strategies/policies.

A territory should thus go beyond 'structural' strategies and policies (Weber and Rohracher 2012) aiming only at improving the quality of business environment or enhancing connectivity among actors within the system, for example, to also focus on 'transformative' policies aiming at transforming the whole system of innovation through the development of new activities, technologies and industries. As Edler and Boom discuss (this volume), besides the definition of the challenges to be addressed (i.e. priorities in the language of the RIS3), policies should also disentangle the processes by which these challenges should be articulated into lower levels of aggregation (i.e. firms, agencies, research groups, etc.), demanding new levels of 'operational intelligence'.⁵ It is therefore a mistake to see smart specialisation as an isolated concept. Rather, it reflects the broader renaissance of industrial policy in the context of new understandings of the complementary roles that the public and private sectors can play in selecting which economic activities to prioritise (Wade 2012). Naturally, this new policy making setting also involves a larger degree of uncertainty, as the government is not the only actor with the 'absolute knowledge', but rather another actor to be considered.

The above discussion links with the second novelty of the smart specialisation concept, the so-called entrepreneurial discovery process (Foray et al. 2009). This idealised process of discovery is at the core of the strategies, linking the 'who' and the 'how' of the process of strategy building with the selected priority areas. Following Rodrik's view of new industrial policy, the entrepreneurial discovery process must involve not only public but also private stakeholders from the 'quadruple helix' of business, government, research and civil society (European Commission 2012). Public policy actors therefore act more as catalysts of strategies, and policy-making evolves from a government-led approach to a more holistic and integrated one in which private actors play a stronger role. Therefore, both public policy actors and other stakeholders can be considered strategic entrepreneurs.

⁵ As Magro and Nauwealers (2015) argue, RIS3 are partially articulated by policies and their instruments. In this sense, it is necessary to shed light on key policy issues such as the competences that are needed for the governments to face the transitions from one policy role to another (e.g. mission-oriented policies through entrepreneurship), the change in routines, practices and regulations, the definition of requirements, the criteria used in the evaluation of public tenders, etc. (see for example Valovirta 2015; Andrews et al. 2016). However, addressing the multiple shapes that operational intelligence related aspects can take, despite central to the effectiveness of RIS3, are beyond the purposes of this paper and remain for further research.

2.1.- Where is public procurement in Smart Specialisation Strategies?

Smart specialisation aims to identify strategic goals for territories. From this perspective, policy instruments are only one possible means of reaching these, given private action should also be considered as part of the regional strategy implementation (Magro and Nauwelaers 2015). Public action still remains an important element, not only because it includes deploying public means and resources, but also because government can act as a catalyst of private investment or as a partner of private actors.

As already noted, PPI is included in the notional portfolio of policy instruments relevant for the implementation of smart specialisation strategies in the first RIS3 Guide (European Commission 2012).⁶ The Guide identifies some of the main barriers that public actors have to face in order to effectively implement PPI. It also highlights that PPI has the potential to work in RIS3 as a tool for change and transparency, especially in fields in which technologies are in an early development stage and where public actors may play a lead user role.⁷ In order to exploit that potential, the Guide suggests that regional governments should have the necessary competences to implement PPI.

Beyond the above, little explanation has been offered as to *how* PPI links to the two key concerns of RIS3, vertical prioritisation and the entrepreneurial discovery process.⁸ In addition, there is little evidence to date of its use as part of regional or local development strategies, a gap we help fill with this paper. More importantly, the treatment of public procurement in the RIS3 Guide and the scarce literature that tackles this issue in relationship with the regional or the local level has not been geographically 'sticky', and given little importance to the potential of public procurement for anchoring innovation supply or demand in regions, as highlighted and discussed by Uyarra et al. (2017).

Moreover, PPI is not necessarily seen as a straightforward instrument by regional policy-makers (Jackson 2016). It can carry high implementation costs for regions with no previous experience and most regional actors retain a limited view of how this demand-oriented approach could benefit local supply, even if (often) not in a direct way (see Section 4).⁹ As a result, public procurement remains an underexplored policy tool in sub-national innovation strategies, and in particular in RIS3. In the next section we will further explore the potential of PPI to then link it to regional and sub-national innovation strategies.

⁶ In the second Guide it only appears as an example of a tool useful for the entrepreneurial discovery process (Gianelle et al. 2016).

⁷ Lead users are defined as those "users whose present strong needs will become general in a market-place months or years in the future" (von Hippel 1986: 791), and therefore, they can be central in creating an innovation friendly climate for the introduction of innovation, which subsequently diffuses into other markets (Li and Georghiou 2016).

⁸ Morgan (2016) considers that public procurement is the 'sleeping giant' of regional innovation policy.

⁹ To address this challenge, the Procure network, an initiative commissioned by the EU's URBACT III programme, aims to support cities to enhance procurement processes. For some of the barriers sub-national actors see in benefiting from procurement processes see Jackson (2016).

3.- Innovation-oriented public procurement and their relevance at sub-national levels

Debates about the positive impacts of demand-side innovation policies took place as far back as the 1970s (Mowery and Rosenberg 1979). The growing literature on PPI has mostly dealt with definitional issues in relation to the rationales, means and processes (Edler and Georghiou 2007; Hommen and Rolfstam 2009; Rolfstam 2009; Uyarra and Flanagan 2010; Georghiou et al. 2014; Edquist and Zabala-Iturriagagoitia 2015). It has also provided increasing empirical research based on case studies of PPI-driven innovations (Yeow et al. 2015; Edler and Yeow 2016), assessed the impact of PPI (Aschhoff and Sofka 2009; Guerzoni and Raiteri 2015) and discussed the main barriers and challenges associated to its implementation (Uyarra et al. 2014; Lember et al. 2015).

PPI can be characterized not only as a process (Edquist et al. 2015), but also as an interactive learning space (Lundvall 1992). This is because interaction between procurers and suppliers is required in order to mitigate the potential drawbacks of information asymmetries and to create the conditions for the subsequent development, diffusion and uptake of innovations (Chicot and Matt 2015), a rationale also shared by the RIS3. Both users and producers need some degree of interaction to face the several challenges and risks associated to the uncertainties underlying innovation processes (Lundvall 1993). Users' uncertainties are related to the technological characteristics of the products or systems to be procured, their performance, their potential impact on the targeted users, the risk aversion in the definition and the later granting of contracts, financial risks, and the organizational and societal risks associated to the procuring organization (Dale-Clough et al. 2016). Conversely, producers' challenges are mostly associated to the capabilities required to meet the demands and needs signalled by the public agencies in charge of these procurement policies and initiatives, and the technological challenges related to the performance requirements so as to meet the needs of the procuring agencies. The communication of these potential needs constitutes another central feature of procurement processes, as it signals both the state and the level of sophistication of the demand (Edler et al. 2015).

The literature has characterized such interactions as creative dialogues or public-private partnerships (Burnett 2009), or conversations (Lester and Piore 2004). The notion of 'conversations' (Rutten 2017), as discussed by Uyarra et al. (2017), provides a good metaphor for these interactions between users and suppliers, namely, a dialogue between different agents from the quadruple helix in order to establish priorities for a region. Two considerations are important for effective conversations, who participates in the conversation and what they talk about (Lester and Piore 2004). Conversations modulate the participation and content of early dialogues among key stakeholders in public procurement, and these can be more or less anchored to a particular place.

Uyarra et al. (2017) have studied the spatial and social aspects of interactions that are relevant for PPI. They discuss how conversations can lead to further stakeholder mobilization, which in the context of RIS3 would be oriented towards priority setting and entrepreneurial discovery processes. One of the key advantages of PPI is that it gives

room for articulating an entrepreneurial process facilitated by public policy actors (Timmermans and Zabala-Iturriagoitia 2013), in which private stakeholders play a big role. PPI can have a transformational role (Neij 2001), by changing the structure of competition to make it more attractive for new entrants (i.e. entrepreneurial role). The potential of PPI for prioritisation is higher than other traditional R&D and innovation instruments, as it necessarily implies a proactive process of prioritisation linked to thematic areas, something less direct of being reached with the implementation of supply-oriented measures. At the same time, regional innovation strategies also aim to reinforce the system as a whole, something that can also be reached by using PPI as a generic process (Weber and Rohracher 2012). In the next section we will further discuss the complementarities that may arise from joining PPI and subnational innovation strategies, introducing an evolutionary framework that may allow territories to define their innovation strategies in a dynamic way.

4.- A framework for analysing the link between public procurement and smart specialisation

One of the main characteristics of RIS3 is that they are built on regional assets or capabilities. Regions should prioritise those activities in which the territory has high regional capabilities or at least potential to develop them. The aim is to encourage activities that can upgrade existing capabilities and capture value for the region. How and when can then value be captured through procurement? Local sourcing has often been seen as a goal that conflicts with or undermines the innovation potential of public procurement (Mahroum and Al-Saleh 2013). Protectionism and prioritising local businesses in procurement processes can easily lead to duplicate products, corruption and irrational investment (Li and Georghiou 2016, p. 348). However, in some cases, the knowledge needed to develop an innovative solution for a problem may be very much linked to already existing regional assets or capabilities. Encouraging early conversations can promote an appreciation by procurers of place-specific knowledge assets and expertise so that this knowledge can shape the procurement design and the definition of specifications.¹⁰ If such assets do not exist locally, then it may be possible to encourage extra-regional conversations that can in turn help upgrade local capacity.

Such conversations could improve the likelihood of innovation, and at the same time be a way for anchoring procurement in the region, something which can be linked to the development of a sound RIS3 around regional capabilities. As Uyarra et al. (2017) note, locally anchored procurement does not imply privileging local and/or incumbent suppliers, and indirect ways of anchoring may make public investments more spatially sticky in terms of value and technological upgrade of a location (Uyarra and Flanagan 2010). Being attractive for global players to enter particular markets and as a site for experimental learning can also benefit the innovation capabilities of territories. In line with Mahroum and Al-Saleh (2013, p. 323), 'anchoring supply' processes are here defined as the ability to identify and domesticate external sources of innovation in the local economy. Therefore, anchoring supply through procurement might be useful both

¹⁰ This can be done for example through market testing activities or via interaction with local clusters or public private partnerships. Public procurement can also affect the terms of participation, in terms of ensuring that small local players are not excluded from these conversations.

for reinforcing capabilities where a region already possesses assets, and for developing new assets in the framework of established priorities. This involves deciding which procurement needs align best with regional capabilities and should be given strategic importance.

In addition, public procurement can modulate the content and breadth of the previous conversations in terms of whose needs are being addressed and how specific these are to the region. Regional strategies could be set up based only on regional needs, highly place specific, or to respond to global or grand challenges. Public procurement is helpful in both scenarios. It can be narrowly framed to address very immediate and concrete needs with little room for innovation, or may address broader socio-economic problems or challenges that may be place specific or common to many regions.

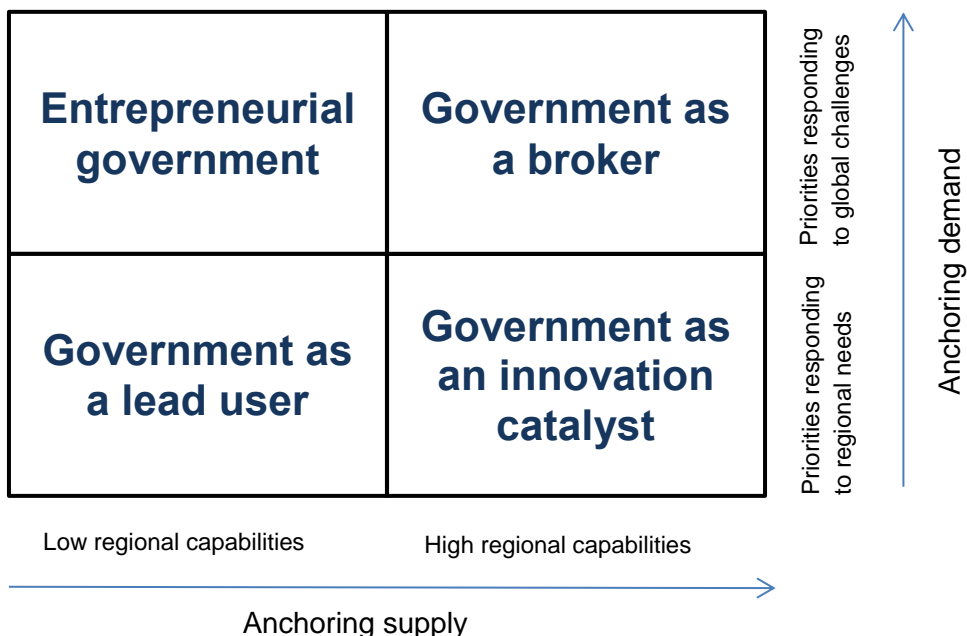
A procurement process that is reflective of the specific economic, social and environmental needs of a location can contribute to advancing regional economic development goals. Too tailored or specific a solution might not attract innovative suppliers, locally or globally. However, procurement might provide room for conversations with local or international actors so that initial solutions to local problems may eventually diffuse to other localities challenged by similar socio-economic and environmental problems (Uyarra et al. 2017). In this regard, regions with specific problems/needs might act as lead users to promote innovations and new developments, reflecting that regions can be good laboratories for experimentation (Henderson and Morgan 2001).¹¹ The key issue here is how to shape demand in such a way that international and innovative sellers are interested in engaging in such conversations. To do that, aggregation of demand or bundling - understood as the identification of common or similar current or future requirements within an organisation (in this case the region) and with other organisations/regions (OGC 2006; Timmermans and Zabala-Iturriagagoitia 2013) - can facilitate the provision of products and services by suppliers. This process of bundling calls for communication, coordination and feedback mechanisms (Uyarra et al. 2017), and is easier in cases in which regional priorities respond to global challenges, as there will be more regions with common requirements and needs, and it should be easier to anchor demand through public procurement processes. Unbundling strategies might be an approach for regions not only to anchor demand but also supply, through the promotion of conversations in technologies or developments in which the region has capabilities and are common to other places.

On the one hand, bundling strategies respond to an entrepreneurial regional government, engaged in the entrepreneurial discovery processes envisaged under smart specialisation. On the other, unbundling strategies place the region not only in the role of pioneer in some products/technologies, but also as a broker between supply

¹¹ If local demand is highly sophisticated, then it can provide room for further opening to external markets, making it possible to use PPI as an instrument for economic development based on innovation (Pickernell et al. 2011). When the local demand is not sufficiently sophisticated, PPI can also nurture the improvement of the capabilities of the local supply by increasing their absorptive capacity, in such a way that local firms may become innovative enough not only to supply the local demand but also to expand to other markets with similar needs.

and demand in other territories, which makes public procurement a key tool for regional development and smart specialisation strategies.

Figure 1.- A framework for analysing the multiple roles governments can play in RIS3 through PPI



Source: Authors' own elaboration

Figure 1 illustrates the different roles regional governments/agencies can have by including innovation-oriented public procurement within their regional strategies. It should be noted that all four possibilities are important to establish regional itineraries. Hence, this framework allows for an evolutionary definition of territorial innovation strategies in a dynamic way. Which role is adopted will depend on the regional context (i.e. path dependency), the availability of capabilities, and the local or global orientation of the priorities set in their prioritised development areas. According to this framework we distinguish four different roles for local and regional governments:

- **Government as a lead user**, in those regional priorities or activity areas in which the region does not have strong regional capabilities yet, but where developments are high relevant and specific to the region;
- **Government as innovation catalyst**, in those regions where supply is highly developed but still has to be directed towards regional needs, and thus, developing supply through procurement ('anchoring supply') is a process that can be achieved by public procurement conversations;
- **Government as entrepreneur**, where priorities respond to grand challenges relevant to the region, but where capabilities remain at a low level. This role could also be regarded as mission-oriented government, and public procurement may constitute a way to further strengthen existing capabilities;
- **Government as a broker**, where the region has already developed capabilities to respond to grand challenges, and public procurement is a key element for

supporting these. Public procurement is here employed to develop and reinforce local and regional supply, but with a strong focus on the global demand ('anchoring demand'). This role could also be regarded as diffusion-oriented government.

Summing up, governments could play different roles by including PPI within their innovation strategies. These different roles might depend on the interaction or nexus of the two different axes: the degree of capabilities of a territory and the potential demand of the goods/services/technologies to be purchased. Whether the development of the innovation responds to a wide demand or to a local demand would affect not only the type of policies to be defined (i.e. mission-oriented or diffusion-oriented), but also the role played by governments within public procurement, and therefore whether the focus is more on the supply side (i.e. anchoring supply) or on the demand side (i.e. anchoring demand). In all cases, PPI is part of the entrepreneurial process of discovery, and although government has a key role in this, conversations might help to reinforce the role of private actors in such a process.

5.- Case studies: illustrating regional development paths through PPI

In this section three cases are used to illustrate the different roles governments can play in their innovation strategies through PPI, providing evidence of how these are played-out, and showing how they can be anchored to particular places. Methodologically, we adopt an argumentative turn (van Eeten 2007). According to it, arguments or narratives are regarded as ordering devices for sense making (Pérez-Lejano 2013), as they help provide arguments for policy analysis. Narratives help to make sense of the factors underlying policy processes, while they also help foster critical learning (Arrona 2017). The cases in this section do not thus aim to be exhaustive, but just to illustrate the potential of the framework outlined in the manuscript. The approach followed was based on multiple case studies, given its appropriateness when conducting exploratory research in new topic areas that require new conceptualization (Eisenhardt 1989). Besides, the case study approach is appropriate in contexts in which 'when', 'how' or 'why' questions are being posed (Yin 1984, p. 13), as it is the case here.

Initially, we started from a desk study research, collecting secondary data on the three cases, checking existing literature, policy documents (e.g. tender calls, laws, plans, white papers, evaluations), and other written materials and reports. We particularly looked for evidence on the way their smart specialisation-type strategies helped articulate PPI processes, and the role governments played in the combination of the two.¹² Further data was collected through semi-structured interviews with a range of actors from the regions in question. The questions formulated during the interviews were grouped in two main blocks (see Appendix). In particular we focused on meeting

¹² We are aware that in the Malmö case, urban planning decisions had already been made years before the innovation strategy that resembles what is today labelled as the RIS3 was developed. We thus agree with Trippi et al. (2015) in that there have been several factors which have led to the establishment of smart sustainable cities as a priority area and that this priority includes other aspects than just ecologically sustainable development, as it is the focus in this paper.

policy-makers at the government and agency levels, and researchers who had either been involved in the definition, implementation, monitoring or evaluation of the strategies, or the procurement initiatives. These interviews helped us explore the potential policy dynamics in each location as their regional strategies continue to evolve. We decided not to follow a case survey method (Yin and Heald 1975), which allows for a detailed analysis of the case studies to then generalize about their findings, since our purpose was not to get an external validation of our results, but rather to provide a conceptual framework to be internally validated through some cases. Given that RIS3 is still a relatively new approach, there are not yet a large number of RIS3 cases in which PPI has been explicitly used and where conclusions can be drawn from. Thus, the choice of the three cases was driven by the need to incorporate both views (i.e. RIS3 and PPI). We also selected cases which promised variation in the roles played by government.

In the Basque case we primarily focused on engaging with policy-makers from different regional and provincial bodies that either currently or in the past carried out administrative duties in relation to STI policy (see Magro et al. 2014). In addition, we also conversed with other stakeholders that represent formal decision making processes at the county and local levels, such as research centres and firms in the bio and nano-fields. For the Galician case we interviewed three researchers from the University of Santiago de Compostela, and a public servant from the National level who was involved in the development of procurement initiatives in Spain. In the Malmö case, the interviews with key policy-makers in charge of sustainable procurement were complemented by site visits and discussions with beneficiary firms. Overall, 13 semi-structured interviews were conducted in the three locations, 6 in the Basque Country, 4 in Galicia, and 3 in Malmö. These interviews were undertaken between June 2012 and March 2013 in the case of Malmö, while those concerning the Basque and Galician cases have been carried out between April 2016 and March 2017.

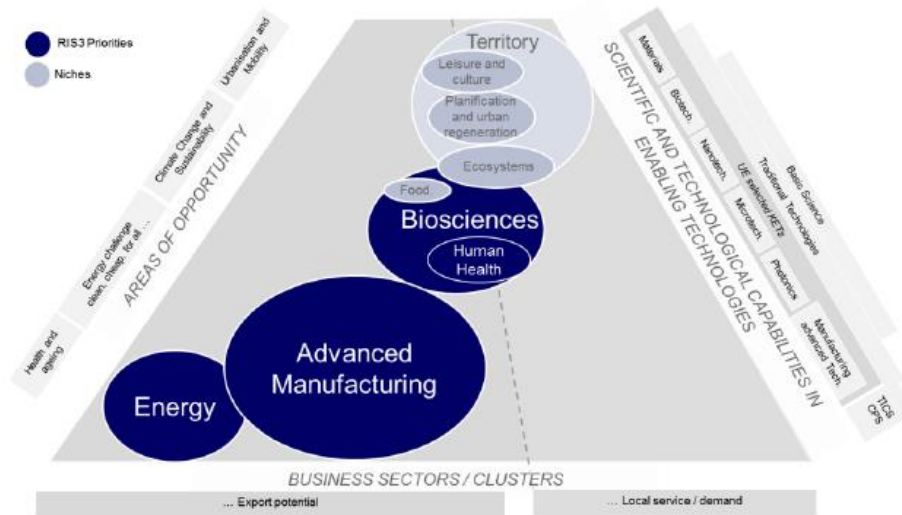
5.1.- Basque Country

The Basque Country is a region in the North of Spain that has been studied as an archetypal example of regional development, being one of the few regions that can be considered a real regional innovation system (Cooke and Morgan 1998). Currently, it is also being recognised as a region having a successful design and implementation of its RIS3 (Aranguren et al. 2016b). Following the consensus-based approach of Basque STI policy making, the Basque RIS3 has been built harmoniously following the path set by previous STI policy plans (Morgan 2013), and in fact, it has been one of the few regions in Europe that already had a smart specialisation strategy before the term was spread by the European Commission.

The Basque Country is one of the few European regions with strong competences in STI policy (Magro et al. 2014). On that basis, Basque STI policy has been developed with a high degree of autonomy, characterised by a resource abundance that has made the Basque region an example for regional development and transformation (OECD 2011). There are some central characteristics to Basque STI policy that explain the continuity of its policies (Valdaliso et al. 2014). One has been the commitment of the regional government to push STI in a continuous and systematic manner, usually

by implementing resource intensive supply-based instruments (i.e. mainly subsidies) (Magro 2014). Another interesting characteristic of Basque STI policy and strategy formulation has been the combination of policies aiming at reinforcing the present with others aiming at creating new future capabilities. Following that path, the priority areas included in the Basque RIS3 were chosen on the basis of the previous STI strategies, being directed towards advanced manufacturing, energy and biosciences-health (see Figure 2).

Figure 2.- Priorities in the Basque RIS3



Source: SPRI/Basque Government as illustrated in Aranguren et al. (2016a)

The three priorities are not new to the region. However, biosciences-health does not count with a long tradition in the Basque STI system. In 2003, the Basque Country launched a specific strategy directed to biosciences (Biobasque), with the objective of developing an R&D-intensive industry, almost from scratch (Magro and Navarro 2016). The orientation of the RIS3 toward biosciences-health thus constitutes an example of an emerging industry in which the region lacked STI competencies, which is also the case at the moment of writing this paper. With the launch of the Biobasque strategy the region started to build a sound STI supply infrastructure by creating new research centres in the field, promoting the creation of a bio-industry, and seeking diversification towards biosciences-health in those existing industries that had the potential to do so (e.g. nanotechnologies). Despite all these efforts, biosciences in the Basque Country still only represent around 1% of the regional GDP (Orkestra 2015). This suggests that, although the Basque region has successfully developed supply side capabilities in R&D and S&T, there remains a strong lack of capabilities in relation to innovation on the demand side, reflecting the above mentioned long-standing focus on supply-side instruments. Only in recent years are demand-side instruments starting to be considered within the Basque innovation policy-mix, PPI being one of the demand-side instruments that is receiving some attention.¹³

¹³ Some previous initiatives on the use of PPI can be found in the vertical priorities of energy and health. However, these have been primarily experimental (i.e. demonstration projects)

The role PPI could play in the framework of the health priority is particularly important, and has been understood in this way by the regional policy-makers as well. It is not only that the Basque region holds the competencies in innovation policies, but also the region holds competences in health and has built a strong healthcare system (Osakidetza). This provides an advantage among other European regions and this is how the regional government has understood it. Since the launch of the Biobasque strategy, the regional government has fulfilled several roles in its deployment. Besides funding the creation and development of knowledge organisations in this area and promoting the creation of spin-off firms, it has also positioned itself as a lead user, by promoting PPI. This means going beyond the state-of-the-art for most regional and national firms. These conditions make it possible for the region to become a good example of a 'laboratory' for companies to develop and test new developments. The demand of the Basque healthcare system is large and sophisticated, potentially creating the conditions for firms not only to satisfy its internal demand, but also to export their goods and services to other healthcare systems worldwide. In fact, it is understood that if the public health sector might act as a lead user and validate Basque developments (although it might validate other worldwide developments, as well), that would support the development and differentiation of those products. It is precisely the testing and validation stage the one that it is not covered by traditional R&D&I instruments in the region, and it is why PPI has been launched as a consequence of the Biobasque strategy (also trying to fulfil the regional needs and gaps).

PPI for healthcare in the Basque Country is still on an early development stage, and a new PPI initiative is currently under development. Within this initiative there is room for any company, not only regional ones nor those emerging from entrepreneurial discovery processes, to provide ideas for new developments that will be later selected and be part of pre-competitive dialogues.¹⁴ This PPI initiative thus gives room to all those actors with a potential impact in the region to provide new ideas that might help upgrade regional capabilities.

The Basque case constitutes an example of a regional government acting as a lead user through PPI, where current regional capabilities in health remain low and where priorities (so far) respond to regional needs of the Basque health-care system. It is also an example of how PPI could be included as an additional instrument to the already existing policy-mix (and a consequence of a planned regional strategy). According to our framework, the Basque region has two potential paths to follow as far as its biosciences-health sector is concerned. On the one hand, it could aim to anchor supply through PPI processes, targeting the development of high regional capabilities, both at the scientific and industrial levels. In this situation, the government would need to go through a transition process to move from being a lead user to play a role as an innovation catalyst. On the other, it could aim to anchor demand through bundling processes, although this path would be more risky. In this second scenario, the government should try to move forward acting as a mission-oriented entrepreneur,

rather than market oriented, and have not been further developed (e.g. Marine Oscillating Water Column project).

¹⁴ More information about PPI in the Basque health system can be found here (in Spanish): http://www.osakidetza.euskadi.eus/r85-ekcpi01/es/contenidos/informacion/compra_publica_innovadora/es_def/index.shtml

focusing on priorities that respond to global challenges, rather than at local ones, as has been the case to date.

5.2.- Galicia

The region of Galicia is located in the north-west of the Iberian Peninsula, on the most western point of the EU. Galicia is a coastal region with a clear rural character. It has a population of almost 3 million inhabitants, which is highly dispersed across its geographical boundaries. Galicia exhibits three particularities which have influenced its RIS3: First, it is rich in forest, marine and energy resources, and many of the region's socio-economic activities are related to traditional sectors such as fishing, marine activities and related industries. Second, some 23% of the population are older than 65, while the population under 15 years old has decreased from 23% in 1981 to 11% in 2013. Finally, levels of unemployment are around 20%.

Galicia has made an extensive use of PPI at multiple levels, such as in the Galician Health system (SERGAS), the University of Santiago de Compostela, and the City of La Coruña (Xunta de Galicia 2011). As a result, Galicia has been singled out for the effective use made of PPI in their policy processes. For example, in 2013 the region was recognized by the European Commission as a reference region in active ageing, as a result of their extended practices. That same year, the SERGAS was given the National Award in innovation and design-based PPI. Finally, in 2015 the region received the second European Procurement of Innovation Award 2015.

One of the key reasons why Galicia decided to focus on PPI has to be found on the availability of funding at the European Technological Fund 2007-2013. The Technological Fund is included in the wide spectrum of funds available within the European Regional Development Funds (ERDF). It is dedicated to the promotion of business R&D and innovation in Spain, being Galicia one of the territories regarded as "convergence regions". Hence, it was this opportunistic behaviour which thrust Galicia to focus initially on this policy instrument and gain experience from its implementation. This explains why the least innovative regions are also those in which PPI has been used to the largest extent (Peñate Valentin and Sánchez Carreira 2015). Even if the experience of Galicia in PPI is longer than that to be found in other Spanish regions such as the Basque Country, the motivations to focus on it are not related to its strategic use, as it is in the next case.

Galicia has traditionally counted with leading research in health (i.e. ageing, biomedicine, molecular biology), particularly carried out at the University of Santiago de Compostela (established in 1495). As a result, the University has led to the establishment of more than 100 academic spin-offs in the medical area in the last three decades. This entrepreneurial development also responds to the lack of keystone organizations in the region that could pull the extant research and bring it to the market. These strong S&T capabilities, together with the regional demographic structure, set the ground for the further development of the Galician RIS3, and the decision to focus on health as one of the key priority areas for the region. The diagnosis made during the formulation of the RIS3 for Galicia 2014-2020 identified 10 priorities grouped into 3 challenges (Xunta de Galicia 2014):

- Challenge 1 - New model for management of natural and cultural resources based on innovation: it seeks to modernize traditional Galician sectors by introducing innovations that provide higher yield and efficiency, and reorients them towards higher added value industries (e.g. energy, aquaculture, drug, cosmetic, food, cultural activities);
- Challenge 2 - New industrial model based on competitiveness and knowledge: aims to increase the technological intensity of the Galician industrial sector through hybridization of key enabling technologies (e.g. bio and nano);
- Challenge 3 - New healthy lifestyle model based on active ageing of population: ambitions to position Galicia as a leading region in the supply of knowledge-intensive services linked to a healthy lifestyle model (e.g. active ageing, therapeutic application of fresh and marine water resources, functional nutrition).

Due to the experience the region had achieved with PPI processes, prior to the establishment of the RIS3, the regional government determined PPI as one of the central means by which the Galician RIS3 should be articulated. In other words, existing regional competences and the policy learning associated with their previous experience of PPI helped the region define its own RIS3. So far, PPI is targeting those regional challenges and priorities related to its health sector, with ageing as the main challenge being addressed. However, Galicia aims to become, through PPI, the leading region in Southern Europe in the implementation of new technologies in the field of active ageing and healthy living, and in the promotion of personal autonomy (Xunta de Galicia 2014, p. 105).

The Galician RIS3 has thus a clear internationalization character, rather than only fostering local economic development (Xunta de Galicia 2014). The purpose of the Galician RIS3 lies in the development of technologies and innovations that can be used not only to satisfy the internal market needs, but also to be exploited elsewhere through Galician SMEs. This naturally implies the need to support the internationalization activities of the Galician productive sector. In this regard, it is still too premature to conclude whether the strategy has achieved its goals, as the strategy is still running and there are no sound data as to date on the share of Galician SMEs that have managed to reach and succeed in international markets. However, the very preliminary evaluations that have been undertaken seem to point in a positive direction (see SERGAS 2013).

Two ambitious programs related to PPI in the health sector can be identified in Galicia, Hospital 2050 and InnovaSaúde. Given the small and entrepreneurial character of most Galician firms, the region has followed an anchoring strategy by which large international companies have been attracted to supply services to the Galician Health Service (SERGAS). In fact, approximately 50% of the supplies to the SERGAS is done by local Galician SMEs, while the remaining 50% of are faced by large international suppliers. With this balance the SERGAS expects to create positive spillovers and knowledge transfer activities between the large and the domestic suppliers, so the latter can improve their technological capabilities and the degree of sophistication of the services they provide. In other words, the Galician government is playing a catalyst

role, seeking for an international growth of the local supply. As discussed, so far, Galician PPI initiatives have mainly addressed local needs. However, the region aims to respond to this global challenge by efforts to anchor demand, in which case the government would have to make a transition toward acting as a broker, encouraging the strengthening of local and regional supply in order to be able to target needs associated with international markets.

5.3.- Malmö

Malmö is Sweden's third largest city with around 300,000 inhabitants. It is geographically situated in Skåne, the southern region of Sweden, one of the most densely populated areas of the country. Although the Swedish policy system is rather centralized at the national level, the increase in autonomy for Skåne dates back to 1997 (Zukauskaite 2013). Skåne was one of the first Swedish regions to gain competences for regional development and planning (Tripl et al. 2015).¹⁵

Innovation has traditionally been one of the main political priorities of the region (Henning et al. 2010). One of the recent efforts towards this end has been the "International Innovation Strategy" for Skåne 2012-2020, a strategy that follows the rationale of RIS3. The definition of this regional innovation strategy started in 2007, and has as its major goal to make Skåne the most innovative region in Europe by 2020. Three priority areas are identified: smart sustainable cities, smart materials and personal health. The city of Malmö is in charge of the implementation of the smart sustainable cities, Region Skåne in charge of personal health and Lund University is in the lead in the case of smart materials. Here we will focus on the 'Smart Sustainable Cities' priority, and in particular, in Malmö's local investment program for ecological development, which aimed to accelerate the development of an environmentally sustainable Malmö.¹⁶

The execution of Malmö's local investment program for ecological development was targeted by public procurement. Sweden has a long history in the active use of public procurement and many successes have been achieved in the past (Edquist et al. 2000). In 1995 the association of local authorities in Skåne decided that all public purchasing should be environmentally adapted and recommended a common policy for the municipalities in the region. As a result, the city of Malmö established a procurement framework under which a centralized procurement department (i.e. Serviceförvaltningen) had authority to integrate, manage and negotiate purchase agreements with suppliers according to the eco-standards established by the city council (Christensson et al. 2002).

¹⁵ The competences of Skåne include health and medical services, regional growth and development, public transport, culture and cross-border and interregional cooperation.

¹⁶ To a great extent, the European Housing Exhibition, Bo01-City of Tomorrow, held in Malmö in 2001 was a key determinant in triggering a move towards sustainability in Malmö. The objective of the exhibition was to define a city of the future in a sustainable society based on information and welfare and the Western Harbor was chosen as the area to host the exhibition. It constituted an abandoned old industrial area with environmental problems of contamination due to the already extinct shipbuilding industry (i.e. Kockums machine halls and cranes) that had operated for more than 130 years. As it can be observed, urban planning decisions in the city of Malmö took place before the Scanian RIS3 was defined.

The city of Malmö adopted a very active role at the very initial stages of the project, particularly concerning the requirements that had to be met by the potential supplying companies. In order to identify and define the needs to be addressed in the procurement process, the city of Malmö worked with experts from municipal departments, local urban district committees, as well as dialogues with citizen groups, universities, private companies and other European cities through partnerships (Environment Department 2009). In 2004, the City of Malmö, together with 13 developers, architects and citizens launched a new communication process referred to as “The Creative Dialogue” (see City of Malmö 2009a, 2009b). These dialogues were one way to implement partnerships within the public procurement process, as they provided a platform bringing together various stakeholder groups to discuss common themes related to the new environment. The intention of the dialogue was that both public and private actors would benefit from sharing knowledge before the call was launched, building upon their collective expertise. Including the capabilities of many stakeholders in these dialogues helped to create a common understanding of the project’s ambitious goals and the definitions of the requirements (mainly functional) that should be addressed by the calls.

Another key role played by the City of Malmö during the initial stages of the project was that of regulator. The city of Malmö decided to specify more demanding environmental requirements than those established by the Swedish Environmental Protection Agency for new construction areas (Naturvårdsverket 2009). The procurement initiatives and the public-private partnerships that supported these have had several tangible results for the Western Harbor and the city of Malmö as a whole in relation to sustainability and economic development. The Western Harbor has become Sweden’s first urban area with a climate-neutral energy system, using entirely locally produced energy from renewable sources such as solar, wind and water power (Delegation for sustainable cities 2012). At the same time, it has become the location of the headquarters of some of the high-tech companies that have developed in recent years in Malmö in sectors such as packaging, clean-tech, life sciences, moving media, education, energy, ICT, computer games and design, creating new employment opportunities.

The Malmö case provides evidence for contexts in which local and regional governments start acting as an entrepreneur through PPI, to then shift roles to act as brokers at later stages in the development of the strategy. As the case shows, the priorities of the Scanian RIS3 respond to grand challenges that are relevant to the region, and that are articulated through mission-oriented policies aiming to generate and exploit radical innovations, and creating new industries based on new technologies in their early phases of the technology life cycle, as suggested by Chiang (1991, p. 340). The government aimed to tackle global challenges, anchoring supply, boosting the existing competences and thus strengthening the international positioning of the region. As a result, the regional government could make a transition towards acting as a broker through diffusion-oriented policies, reinforcing the local supply, but orienting it towards a global demand (i.e. ‘anchoring demand’).

6.- Conclusions

In recent decades sub-national regions have become ever more important as spaces for policy making. The current focus on RIS3 is the latest manifestation of this trend. Smart specialisation strategies rely heavily on public policy actors to play the role of articulating and facilitating entrepreneurial discovery processes around regional assets and capabilities, so as to articulate new and/or existing demands. While PPI is acknowledged as one potential tool for smart specialisation, there has been little discussion of the extent to which the sub-national level may be a suitable level for PPI, and how it is embedded in wider national and international frameworks. This paper has explored the use of public demand for innovation in pursuit of higher order political purposes. We have explored the relationship between PPI and RIS3, paying particular attention to the multiple roles government can play in the implementation of sub-national innovation policies and initiatives.

The paper provides a new conceptualization of how RIS3, as an example of a sub-national innovation policy, can help articulate demand for innovation. We offer a conceptual framework linking aspects of regional specialisation with the scale and scope of the demand associated with that specialisation. This framework points to multiple scenarios by which governments can influence innovation through PPI and the possible itineraries they can follow, depending on their domains of specialisation and the scale of their demand. Following Pérez-Lejano (2013, p. 102), we define the framework introduced in this chapter as an interpretive scheme that highlights aspects of the issue under study (i.e. the link between PPI and RIS3) and introduces a specific perspective that then allows capturing the complex dynamics involved in policy making processes. With it, we aim to provide a scheme that helps policy makers and territories in interpreting the evolutionary stages they are embedded in, so as to give them meaning and thus guide their actions (see Laws and Hajer 2006). One of the strengths of this framework is its action orientation (Wagenaar 2011). Its major contribution lies in the ability it provides to make a leap from representing and understanding the world to being able to intervene on it.

Our framework contributes to the discussion already started by Pickernell et al. (2011), Mahroum and Al-Saleh (2013) and Uyarra et al. (2017) among others in relation to the geographical split firms follow in public procurement, between the local public demand and the wider local public sector. Not only the different geographies of public procurement need a framework that helps understand them, but also one that helps identify potential evolutionary paths. Specialisation in innovation is not a once-for-all activity but a continuous creative construction/destruction process (Chang and Chen 2004, p. 27). From our point of view, PPI can be seen as a means to achieve a “creative construction” (see Lambooy 2005) according to which new markets and opportunities are created. On the one hand, PPI can reduce the uncertainty underlying all innovative processes through experimentation and the commitment of public demand. On the other, PPI allows for partnerships between existing firms and new entries, and not necessarily the “creative destruction”, by which incumbent firms are substituted by new entries.

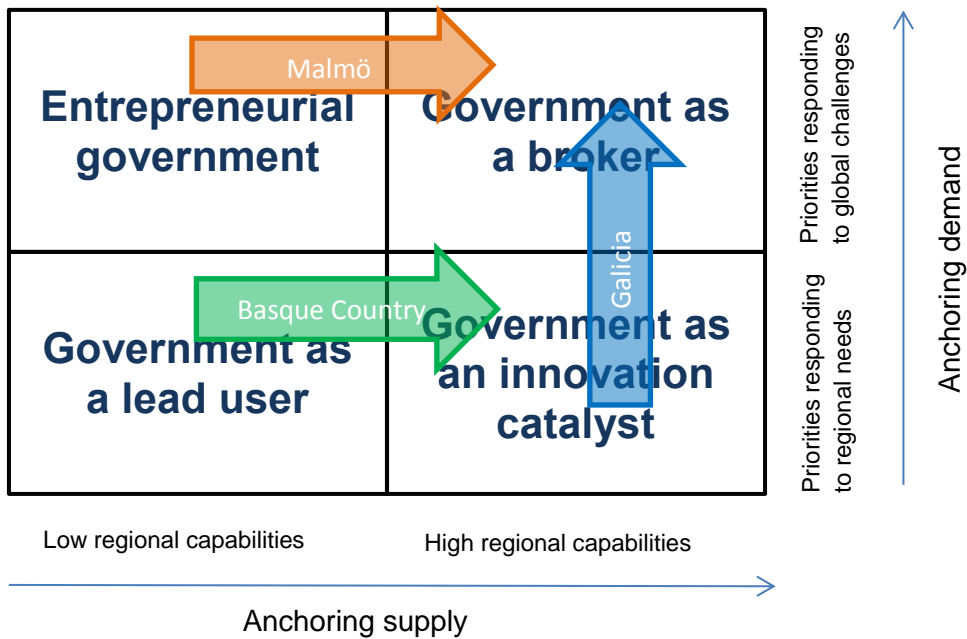
As discussed in the framework presented in Section 4, governments can play four different roles, depending on the availability of local capabilities and the scale of the priorities the territory has focused on: government as a lead user, government as an

innovation catalyst, government as an entrepreneur, and government as a broker. There are thus multiple possibilities for the public sector to act as a facilitator of entrepreneurial processes, and the anchoring of PPI can be central in these. We do not intend PPI to be regarded as the 'aloe vera' of STI policy, but rather as an instrument that can lead to the development of a dynamic view of territorial strategy formulation, so as to achieve sustainable relative comparative advantage. Through PPI governments can play a major influence in the further development of entrepreneurial discovery processes. Anchoring of procurement is important here, whether on the supply side or the demand side. Anchoring can help enhance the development of policies, extending existing paths of economic development or creating new ones.

The four roles we identify for governments/agencies are illustrated through three case studies, two in Spain (Basque Country and Galicia) and another in Sweden (Malmö). The analysis of the three case studies should be regarded as explorative in nature and qualitative in character. As our goal is to explore the rationales for using public procurement in the context of RIS3 and the roles it can play in the articulation of demand, a field that so far has remained unexplored, the use of a qualitative approach seems sensible as qualitative studies provide a good grounding for more rigorously structured research. In addition, the pay-off of qualitative research is higher in fields that are not yet conceptually mature, which is the case here.

In the Basque case we have seen how its long experience in STI policy formulation has allowed the region to create a comprehensive innovation system. However, demand-side interventions are rather new-to-the-region, and hence, the experience and learning gained over the last 30 years of policy practice are allowing the territory to progressively sophisticate the type of policy instruments under use, and anchor supply in the region. In particular, its sound regional health-care system has traditionally played a lead user role, and this creates the conditions for firms to improve their capabilities. In the case of Galicia, PPI was already settled as a policy instrument before the definition of the RIS3, and engagement and creative dialogues had also been implemented previously. In this sense, the extant competences in the definition, implementation and evaluation of PPI processes, paved the way for the subsequent deployment of smart specialisation in the region. Likewise, the Swedish case builds on an extensive experience and path dependence in the use of PPI as a policy instrument. The Malmö experience also evidences how the public sector can play different roles during the procurement process (i.e. from regulator to facilitator).

Figure 3.- Roles played by the governments and potential transitions



Source: Authors' own elaboration

As we have seen, PPI can contribute to the development of thematic priorities while generating, or improving, the context for business development in the territory. It has the potential to help develop local priorities and strategies, whether the region has the necessary STI capabilities or not. In areas and domains in which the region has an existing competitive advantage PPI could aim at anchoring supply, i.e. enabling dialogue with the local supply base and other place-based science and innovation assets. In domains with no pre-existing regional strengths PPI could focus on anchoring demand through stakeholder and user involvement, which would lead to the generation of territorial capabilities and industries. In this case the government could be considered an entrepreneur in the discovery process. Whether in anchoring supply or demand, bundling processes are one of the ways governments can push local firms to take advantage of a broader demand.

Peneder (2016) has argued that it is time to move on from the negative logic of 'failure' in policy thinking. Articulating policies according to the identification of failures implies intervention is only required to correct inefficiencies in a static allocation of resources. Instead, he argues interventions should be oriented to enhance a system's ability to evolve, calling for "dynamic objectives". In this sense, Figure 3 above shows how the roles played by governmental actors may evolve in the future for each of our cases. From our point of view this figure represents the transitions a territory may undergo in its policies, for example, from a mission-oriented to a diffusion-oriented policy, depending on its structural characteristics, needs, and the characteristics of the capabilities (i.e. specialisation) that are available in it at different moments in time.

The way (governmental) roles may shift will depend on what happens to local capabilities and on the current scale of the demand, according to the evolution shown by each location and the results of their respective strategies. Naturally, the directionality of these systemic transitions (Chicot and Matt 2015) will be very much dependent on the result of the pre-competitive dialogues and the procurement calls, still on-going in most EU regions, among other institutional factors. Flanagan and

Uyarra (2016) have argued that the evolution of roles over time, institutional change, path dependency/path breaking and learning in policy processes are all too neglected in innovation policy studies. This paper aims to provide a first step in this direction, and hence, requires further research to build a comprehensive framework that allows for policy intervention in a dynamic way.

One of the aspects in which further research could be developed is the impact that different structural settings have on the four possible roles to be played by the government. How can policies be place-based in territories structurally dominated by large multinational groups? What about if there are no local champions in the specific priority the government wants to focus on? The cases included in the manuscript provide some evidence of the possible strategies to be followed. However, further issues such as the schemes to implement bundling and anchoring strategies remain to be further studied. Similarly, elements of demand articulation that still call for further light are the scale and the critical mass for upscaling and the contexts under which a transition from mission-oriented policies to diffusion-oriented policies can be produced. One of the key elements supporting these possible policy transitions is indeed learning. Hence, the final claim we make here for further research is related to the need for evaluation approaches that allow for the study of the additionality of the public funds in improving the sophistication of the public demand and the capabilities of the public sector. From our point of view, there is clear association between the degree of sophistication of the public demand and the learning that emerges from the practice of PPI (i.e. capabilities), and hence, we strongly call for further research shedding new light on this relationship. Further work on these dimensions in the context of PPI in RIS3 type initiatives will help us build a richer understanding of the role demand plays in the study of territorial directionality.

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Appendix - Guidelines for the interviews

Block 1.- Evolution of STI policies and strategies.

1.a.- Is there an evolution in the modes of governance?

1.b.- Which are the main failures that call for a public intervention?

Block 2.- PPI as an innovation policy instrument

2.a.- When did the territory introduce PPI as an instrument in its innovation policies/strategies?

2.b.- Why did the territory decide to use PPI in certain priorities/sectors? Is there a relationship between the decision to support PPI and the existing capabilities in the territory?

2.c.- Which is the main purpose aimed at through the use of PPI? To support local suppliers, to meet the needs of the local demand, to provide room for internationalization, etc.?

2.d.- Has PPI led to a higher sophistication of public demand? And to the sophistication of the local supply?

2.e.- Has the rationale for the use of PPI evolved over time? May it evolve in the future?