IT TAKES TWO SIDES TO BUILD A BRIDGE

Universities as institutional entrepreneurs in knowledge-based regional development

Lisa Nieth

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UNIVERSITIES AS INSTITUTIONAL ENTREPRENEURS IN KNOWLEDGE-BASED REGIONAL DEVELOPMENT

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FOR MARIO AND EMILIO

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IN MEMORY OF

PAUL BENNEWORTH

WHO HAS PROFOUNDLY SHAPED THIS THESIS AND MY ACADEMIC DEVELOPMENT

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ABBREVIATIONS

Aalborg University	AAU
Catalan Association of Public Universities	ACUP
Aveiro Industrial Association	AIDA
Intermunicipal Community of the Aveiro Region	CIRA
Constructed Regional Advantage	CRA
Creative Science Park	CSP
Denmark	DK
European Commission	EC
European Consortium of Innovative Universities	ECIU
Entrepreneurial Discovery Process	EDP
Evolutionary Economic Geography	EEG
East Midlands Development Agency	emda
European Regional Development Fund	ERDF
Spain	ES
European Union	EU
Finland	FI
Fraunhofer Project Centre	FPC
Gross Domestic Product	GDP
Growth Forum	GF
Greater Lincolnshire Local Enterprise Partnership	GGLEP
Higher Education Institution	HEI
Information Communications Technology	ICT
Institutional Entrepreneur	IE
Institute for Production Technology	IPT
Local Enterprise Partnership	LEP
The Netherlands	NL
Organisation for Economic Co-operation and Development	OECD
Problem-based learning	PBL
Doctor of Philosophy	PhD
Portugal	PT
Regional growth and development strategy (of North Denmark)	REVUS
Regional Innovation Coalition	RIC
Regional innovation institution building arena	RIIBA

Regional Innovation System	RIS
Research & innovation strategies for smart specialisation	RIS3
Smart specialisation strategy of Catalonia	RIS3CAT
Research & Development	R&D
Strategic Economic Plan	SEP
Small and Medium-sized Enterprise	SME
Twente Board	TB
University of Aveiro	UA
Autonomous University of Barcelona	UAB
University of Aveiro Technology Transfer Unit	UATEC
University of Lincoln	UoL
University of Twente	UT

1 INTRODUCTION

1.1 Rationale for the research

There has been a fundamental shift in the way that regional economic development has been approached in the last 30 years, both by policy makers and academics. This shift concerns the nature of growth itself, but it also entails changes to the policy of growth, with both assigning increasing importance to the key element of "innovation". Although innovation is important with respect to both of these elements—as a driver of growth and as a critical strategy for developing policies that boost growth—this thesis is exclusively concerned with the policies that aim to stimulate growth and innovation.

In the last few decades, policy discourses about regional innovation have become increasingly differentiated, and "innovation" in itself has emerged as a key word (Cooke, 1985; Ewers & Wettmann, 1980; Hassink, 1993). While the term used to be wrapped up with other concepts such as "flexible specialisation" or "research and development" (R&D), it is today a dominant goal for regional[1] policy makers (Cooke *et al.*, 2011) across advanced economies, and such efforts have been supported by multilateral organisations such as the Organisation for Economic Co-operation and Development (OECD), the European Commission and the World Bank (McCann & Ortega-Argilés, 2013). This policy shift has been paralleled by an increasing volume of research that seeks to understand regional innovation and economic development in specific contexts, and in particular, to create knowledge that is useful to policy makers in their efforts to stimulate innovation-based regional development.

This increasing amount of research has been accelerated even more as both policy makers and academics have developed the urge to understand why some regions succeed while others struggle or fail (Tödtling & Trippl, 2018). The emergence of studies highlighting inequality between regions and the existence

[1] In this thesis, we understand regions not as pre-defined administrative units, but as territorial contexts in which local organizations and actors move and conduct the activities that we are interested in. For details, see Annex I: Definitions.

of places that "have been left behind" (European Commission, 2019) or "don't matter" (Rodríguez-Pose, 2018) has put additional pressure on those working in the field to develop regional policies suitable to shape practices, ease inequalities and ultimately stimulate economic development in these places.

This perceived urgency has led to a rather quick—sometimes perhaps incautious—development of new regional innovation and development concepts and theories, creating a set of tensions because no time was taken for explanations and applications to reality (Lagendijk, 2003; Markusen, 1999). There has thus been a tendency to develop (new) theories on the basis of limited empirical reference, with the risk that such high-level conceptual explanations can be "difficult […] to operationalize and/or to subject this body of work to scrutiny by applying real world evidence" (Danson, 1999, p. 869). Markusen (1999) highlights that the descriptive characterisations of rather abstract concepts that lack "substantive clarity" are often insufficiently based on empirical observations while still having an effect on the field. While this "incautious" theorising is happening rather quickly, there is comparatively little time to grasp the complexity of the concepts and epiphenomena.

Over 15 years after the debate on "fuzzy" conceptualisation in regional studies (see discussion between Hudson, 2003; Lagendijk, 2003; Peck, 2003), the warning about incautious and fast theory/concept generation is still relevant. We can still detect an almost impulsive development of new concepts/theories lacking "an established practice of developing and reviewing more operational concepts [… that help to bridge the gap to] regional development in practice" (Lagendijk, 2003, p. 719). As a result, there has been an oversight of the real complexities of regional economic development, which in turn has caused the generation of many diverse assumptions on how regional development supposedly "works". Accordingly, the speed at which new concepts are created has led to a failure in checking and testing the existing ones, and unproven concepts have been built into complex theoretical frameworks without being empirically tested. Thus, still today, there is an urgent need for better, slower theory development as well as more thorough exploration of the proposed theories and concepts with the aim of building on solid foundations.

In this thesis, we are going to deal with the particular assumption/ oversimplification that innovation policy is being driven by regional actors. There is a propensity to neglect an important characteristic: that regional partners—and particularly universities[2]—are not biddable (for more details, see Chapter 2.2). While it is expected that universities contribute "easily" to regional development, we clearly see areas where these goals interfere with one another. This incautious concept and policy theory development will thus be questioned in a strategic and calibrated manner. As this is an urgent policy problem, we see a clear role for academic research in formulating a proper microscopic and nuanced reflection on the reality.

1.2 Aims and objectives

There is a widespread assumption amongst regional policy makers and practitioners that successful policies of innovation are dependent upon what have been termed regional innovation coalitions (RICs). These can be defined as groups of actors from different organisations—regional authorities, companies, universities, etc.—who work together to reach a common agenda (Benneworth, 2007; Lester & Sotarauta, 2007). These regional stakeholders are assumed to work together seamlessly to develop and enact common innovation agendas and strategies that coordinate these activities, a process which is thought to ultimately lead to regional development. Strategic processes within these coalitions are assumed to work straightforwardly through harmonious cooperation in what Lagendijk and Oinas (2005a) have termed "happy regions".

The reality, however, does not always mirror this "heroic assumption" of academics and practitioners alike (see, for instance, Benneworth, 2007; Koschatzky & Kroll, 2009; Silva, Teles, & Rosa Pires, 2016). Instead, actors within RICs are quite diverse, have different goals and make their own strategic decisions depending on the priorities that they themselves define. As a matter of fact, regional partnerships are often characterised by messy and dissonant

[2] In this thesis, we use the term "university" as shorthand to refer to any higher education institution that has a substantive knowledge production element coupled with a knowledge transfer element (research and teaching). See Annex I: Definitions.

relationships with tensions between heterogeneous actors (Christopherson & Clark, 2010).

One important stakeholder within these regional innovation coalitions is the university due to its key role as a knowledge institute (Cooke, 2005; Etzkowitz & Leydesdorff, 1997). Universities' active involvement in RIC activities is seen as essential given they are to produce and distribute knowledge to the system and collaborate with diverse stakeholders. Yet universities are complex organisations that lack strong singular strategic interests, which raises the *prima facie* doubt of whether they can (or will) behave in the way that these innovation policies would have us believe. In failing to consider this complexity, scholars and policy makers ignore the reality that universities are often not equipped for coordinated action around their knowledge production and circulation.

Accordingly, there are regional innovation polices being rolled out across Europe which presuppose that this key actor will behave in a specific way even though we already have presumed reasons to believe that they will not. Thus, this thesis addresses this critical issue of understanding how the organisational particularities of universities influence their participation in collective regional innovation policy processes. We aim to develop an account of the conceptual and practical consequences this particular influence might have. As it has become increasingly apparent that peripheral, non-core regions might face distinct challenges while having received limited attention (Eder, 2019; Shearmur, 2017), we will concentrate on these. We therefore aim to analyse the roles of universities in RICs to facilitate understanding of the factors that influence the relevant dynamics in order to illuminate their contributions to regional development.

To address this problematisation, this thesis poses the following overarching research question: *How do universities act as institutional actors in regional innovation policy arenas?* This question will guide the progression of the literature review (Chapter 2), which will foreground those elements that make the overarching question answerable. Subsequently, we develop one operational question as well as three sub-questions which orient the research efforts of the empirical chapters (4–9) in a more precise way. Overall, we seek to construct a comprehensive conceptual framework and provide policy recommendations to clarify the

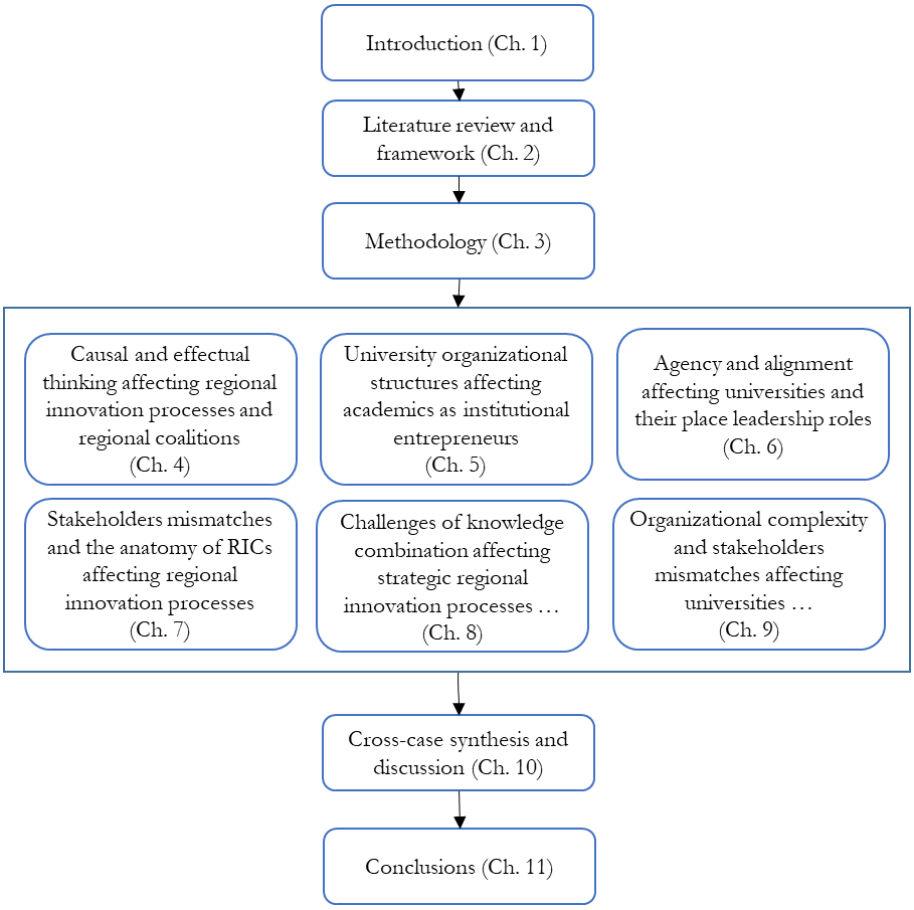
complexities—and ultimately shape—universities' participation in regional development processes.

1.3 Outline

This PhD thesis is based on eight scientific publications (see boxes at the beginning of each chapter) that have been published either as (a) peer-reviewed scientific papers in international journals or (b) chapters in peer-reviewed and edited books; the other is (c) work-in-progress that has been submitted to an international journal. While the first two publications are the basis for the literature review (Ch. 2), the following six publications are presented as stand-alone, empirically-based chapters that are followed by a cross-case synthesis and discussion (Ch. 10) as well as conclusions (Ch. 11). The empirical chapters are displayed in their published form, with the exemption of changes in titles, layout and numbering in order to conform to the logical outline of the thesis. Figure 1 displays the outline of the thesis, showing how the single chapters are interrelated and build up on each other.

After having explained the rationale for this project and introduced the overall research question in this chapter, we present a systematic literature review and develop a conceptual framework in Chapter 2. At the end of this chapter, we rephrase the research question into an operational version that is split into three sub-questions. In the following six empirically-based chapters, we shed light on different aspects of the research questions and the challenges outlined. In Chapter 10, we combine the results of the empirical chapters in a cross-case synthesis, advancing on the framework outlined in Chapter 2. Finally, Chapter 11 answers the research questions; highlights the contributions of this thesis to the established literature and practice; and, finally, reviews limitations as well as opportunities for future research.

FIGURE 1. OUTLINE AND INTERRELATIONSHIPS BETWEEN THE CHAPTERS OF THIS THESIS



SOURCE: AUTHOR'S OWN ELABORATION

2 LITERATURE REVIEW AND FRAMEWORK: REGIONAL PATH DEVELOPMENT, INNOVATION COALITIONS AND UNIVERSITIES

Earlier versions of material that appear in this chapter were published in

- Benneworth, P., & Nieth, L. (2018). Universities and regional development in peripheral regions. In P. Benneworth (Ed.), *Universities and Regional Economic Development – Engaging with the Periphery* (pp. 1–12). Abingdon, Oxon: Routledge.
- Nieth, L., & Benneworth, P. (2018). Universities and neo-endogenous peripheral development: Towards a systematic classification. In P. Benneworth (Ed.), *Universities and Regional Economic Development – Engaging with the Periphery* (pp. 13–25). Abingdon, Oxon: Routledge.

This chapter develops a conceptual framework to clarify how universities function in regional innovation policy arenas. Universities do this as part of processes that are seeking to shift economic development trajectories within knowledge-based regional development. For peripheral regions, these coalitions face the challenge of becoming locked in to low-intensity knowledge pathways. Policies have latterly sought to help those regions break that lock-in, creating new regional opportunities. However, what is not completely understood is the way that regions can change their institutional structures, which is an important causal mechanism leading to the reproduction of that lock-in.

We therefore focus on the roles that universities play in changing these institutional structures, and highlight the paradox that universities are fragmented, fissiparous organisations that are not amenable to strong leadership. This, in return, affects the ways that universities can contribute to solving the institutional problems faced by peripheral regions. In this thesis, we draw upon two main theoretical areas to understand university contributions to the process of institutional evolution: agency and leadership.

We begin by constructing a model that distinguishes actors operating at two levels: strategic and operational, as well as within and outside of the university.

We highlight that relationships between these different elements are critical to the way that this model functions. While it is often assumed that universities will devote specific resources to collective innovation agendas, universities' strategic managers are not necessarily in a position to control all of their innovation supporting resources. In the last section of this chapter, we propose a model focused upon the outlined elements, and we develop a series of operational research questions. We then set out to explain how these are answered through the respective chapters.

2.1 Knowledge-based regional development

2.1.1 Knowledge-based regional development

This thesis is situated within the broader field of evolutionary economic geography (EEG). Economic geographers have increasingly come to realise that traditional economic analysis is inadequate for understanding increasingly complex regional development processes. Thus, inspired by evolutionary economics (Dosi & Nelson, 1994), EEG has emerged, aimed at clarifying and tracking the processes of regional adaptation and evolution capacities.[3] This dynamic change model conceptually combines elements of the social, cultural and political sciences with regional science, geography of innovation, heterodox economics and the natural sciences (Boschma & Frenken, 2006; Kogler, 2015). Kogler (2015) argues that EEG "highlights the important factors that initiate, prevent or consolidate the contextual settings and relationships in which regions and their respective agents … change over time" (p. 709). EEG explains how regions self-transform from within according to place- and time-specific factors and processes (Boschma & Martin, 2010; Hassink, 2010). This focus on developmental transformation and the capacity to adapt allows what is an apparently hybrid nomothetic approach to provide a comparative analysis. EEG focuses on regional-specific features that determine and shape whether some regions have been able to develop successfully, and even renew themselves, while others have not (Gong & Hassink, 2017).

[3] For a detailed analysis of the emergence and development of EEG, see, for instance, Boschma and Martin (2010) or Grabher (2009).

One of the main ideas within EEG is that the present configuration of individuals, entities and localities is determined by past experiences and competencies, or what is referred to as *path dependency*. This concept explains phenomena like regional growth disparities, the development of specific technologies in certain locations and the degree of adaptability of regions (Martin & Sunley, 2010). The long-term development of a region depends upon its capability "to diversify into new applications and new sectors while building on their current knowledge base and competences" (Tödtling & Trippl, 2012, p. 15). Understanding regional reorientations thus requires us to examine how paths of development can be renewed, shaped or created in regions while still accounting for their dependence on the past (a process which is regularly referred to as "creating a space for history" or "taking history seriously" (Boschma & Martin, 2010; Martin & Sunley, 2010)).

While many authors have defined various ways in which new regional pathways can be created, we have decided to follow Hassink, Isaksen, and Trippl (2019) in this respect. They refer to *path development* as an umbrella term, combining the various typologies/mechanisms that have appeared over the past decades. In their view, path development is influenced by various variables, most significantly (a) whether the past trajectories are enabling or constraining, and (b) whether the origins of change are intended/deliberate or accidental. In individual regions, path development will be influenced by a mixture of different interwoven variables that have an impact on each other and might not be separated easily. Accordingly, Meyer and Schubert (2007) believe the formation of new pathways can be found somewhere between "an emergent and completely unplanned process" and a "deliberately and strategically controlled processes" (p. 29).[4]

Contemporary regional structures thus provide the foundation for regional development processes, demonstrating that different elements of that structure interact, grow and evolve. Tödtling and Trippl (2012) attribute path development to the cumulative outcome of actions and events involving diverse actors from

[4] It is out of the scope of this thesis to present a detailed overview of the field of EEG. Nevertheless, there is a significant number of quantitative analyses that have sought to create more general models of regional development over time as part of a research trajectory in spatial econometrics (see, for instance, Combes and Overman (2004)).

within and outside the region, proposing three key repertoires. The first is *path renewal*, which refers to the upgrading or revitalisation of an existing industry, with a specific industry's trajectory changing without a totalising shift in the regional industrial structure. This modification can take different forms and is commonly linked to changes in the regional knowledge infrastructure (for instance, firms may introduce new technologies or update existing ones due to a knowledge exchange with a newly established university).

More significant change is achieved through the second repertoire, *path formation*, through which a region's economic base is broadened; this may be driven exogenously (through, for instance, investment from actors outside the region) or endogenously (e.g., through the diversification activities of existing firms). Finally, *path creation* entails a substantial shift in the regional development trajectory, often from previous or existing paths, with new pathways created as new industries arise out of changes in technological and organisational structures (Martin & Simmie, 2008; Martin & Sunley, 2010). This latter endeavour "requires the existence of assets, resources or competencies rooted in the area" (Tödtling & Trippl, 2012, p. 6) such as a highly-skilled workforce or an excellent scientific base.

2.1.2 The challenge of path inertia in peripheral regions

These path development repertoires, which can be understood as modifications to the evolutionary path, are useful for us when applied to the case of peripheral regions. As outlined above, what drives *path development* can be the processes through which new paths are created, existing paths are formed or old redundant paths are renewed/killed off. Nevertheless, *dependence on paths* can also be beneficial for some regions. For instance, in the case of the pharmaceutical industry, path dependence may be positive in leading to path continuation, as has been observed with the emergence of biotech industries.

Nonetheless, *path dependence* is often seen as problematic insofar as it inhibits path development processes from functioning, which is particularly true in regions that lack dynamic technology assets such as *peripheral* and old industrial regions. Such is the case when there is an opportunity cost of path continuation in one

sector that prevents a diversification into other sectors. What has been observed in other regions is that declining industries may seek to secure their own survival and fail rather than pursuing new interests and innovations (Hassink, 2005). It has been empirically observed that, in these situations, the declining sectors can influence policy makers to support the attempts at path continuation rather than investing in new sectors; this manoeuvre is commonly referred to as a *lock-in*.

An illustration of the aforementioned idea is the coal, iron and steel industry in the German Ruhr in the 1970s and 1980s. The region has been described as being "locked in" its past trajectory, which prevented it from overcoming its path dependency as "strongly embedded regional networks turned from ties that bind to ties that blind" (Grabher, 1993, p. 24). Hassink (2010) defines this more generally as situations in which "initial strengths based on geography and networks, such as industrial atmosphere, highly specialized infrastructure, close inter-firm relations and strong support by regional institutions, turned into barriers to innovation" (p. 450). These conditions are said to occur most frequently in less advanced locales like old industrial or peripheral regions.

Path inertia can be a consequence of different challenges within regions (see Table 1). In this thesis, we define path inertia as the inability to create new forms of collaboration supportive of innovation due to institutional rigidity. Institutional rigidity may be the consequence of institutional thinness (the shortage of actors), fragmentation (where partners are unwilling/unable to cooperate because of internal boundaries) and/or of too strong of ties (Tödtling & Trippl, 2005). Returning to the example of the Ruhr region, the "future initiative" (Zukunftsinitiative Montanregion) marked an attempt to break the above-outlined institutional rigidity by advancing the new mobilisation of "a rather broad range of actors at the local and regional level" (Grabher, 1993, p. 273).

TABLE 1. SELECTION OF POTENTIAL CHALLENGES FOR PERIPHERAL REGIONS

Tensions that can lead to path inertia in peripheral regions	**Authors**
- Lack of actors and support organisations that enhance technological change and innovation. - Dominance of small and medium-sized enterprises (SMEs).	Tödtling and Trippl (2005)
- Less developed in terms of the innovation interface not being backed by the resources and support necessary for networking,	Doloreux and Dionne (2008)

training, technological transfer and other knowledge support systems.	
- Mismatch between the regional supply of innovation and the demand for it.	Cooke, Boekholt, and Tödtling (2000)
- Small-scale innovations that are incremental in nature. - Innovation takes place through the application of existing knowledge or through new combinations of knowledge.	Asheim and Coenen (2005)

- Fewer possibilities for entrepreneurial growth due to:
  - the comparative absence of regional competition;
  - the limited scale and scope of local market opportunities;
  - the distance from the largest/larger markets.
	North and Smallbone (2000)

SOURCE: AUTHOR'S OWN ELABORATION

2.1.3 Contemporary conceptual approaches to regional economic development

New theories and conceptual ideas of how policy can achieve change in regions—and thus counteract the challenges outlined above—have emerged over the last few decades. While Grabher (1993) paints one particular picture (as outlined above), these new theories are borne out of the hope to answer questions on how this type of change can happen more generally. Thus, the concepts introduced in what follows are part of the latest step in a much longer process of incorporating knowledge capital in theories of economic development.

The main driver for this change was a growing understanding of the increasing importance of knowledge capital to explanations of economic growth (formally through the relationship of total factor productivity to productivity growth, see Romer, 1994; Solow, 1994; Temple, 1998). Lagendijk and Cornford (2000) highlight that knowledge is to be seen as being "highly tacit, localised and untraded, embedded in localised networks of individuals and institutions" (p. 210), and it therefore has the potential to form a specific competitive advantage for a particular region. This new focus provided the starting point for the emergence of what Moulaert and Sekia (2003) were to call "Territorial Innovation Models", with the aim of providing explanations of how a region's specific characteristics could facilitate interactive learning processes and thereby affect growth.

Where these models fell short was that they neither provided satisfactory explanations for different regional developments nor guidance for policy making, instead simply describing—albeit sometimes quite abstractly—the characteristics of regions that *had been successful in the past*. As policy makers sought to operationalise these theories into policies, there materialised the realisation that their one-size-fits-all approach was problematic (Boschma, 2013; Tödtling & Trippl, 2005). Rooted in emerging concepts of evolutionary economic geography, one answer to this tension was the formulation of the concepts *constructed regional advantage* (CRA) and *smart specialisation*, which were intended to better elucidate the link between regional activity today and improved prospects tomorrow.

We here focus on these two concepts that emerged over the course of the 2000s, both aimed at activating regional stakeholders, encouraging their active engagement within the region and promoting the joint exploration of future pathways. As peripheral regions generally have an institutional rigidity problem, the activation of agency is seen as one potential solution to this issue by creating regional approaches that work for all type of regions (Rodríguez-Pose, 2013).

Constructing regional advantage

The first concept that we consider, that of constructed regional advantage, construes proactive public-private partnerships as applying existing knowledge in new ways to create regional economic advantages (Asheim, Coenen, Moodysson, & Vang, 2007). Based on this perspective, *regional advantage* and new regional pathways do not always arise spontaneously (particularly in peripheral regions), and hence they should be deliberately and pro-actively *constructed* in ways specific to regional economic and governance contexts.

Following the CRA model, knowledge transfer and learning are conceptualised as more likely to happen between sectors/industries that are sufficiently (technologically) related but simultaneously not too cognitively proximate (where there are few opportunities for cross-industry learning). Emilia Romagna in Northern Italy emblematised this idea as its diffused engineering knowledge base provided the foundation for many high technology sectors to emerge in the post-war period, including robotics, car manufacturing and agricultural machinery.

Asheim, Boschma, and Cooke (2011) attribute this knowledge accumulation and exchange to the fact that "these new sectors not only built and expanded on [the] extensive regional knowledge base, they also renewed and extended it" (p. 895).

At the same time, CRA is based on the notion that stakeholders with a similar knowledge base organise their innovation processes and relationships with third parties in similar ways. Thus, while innovation activities involve different kinds of knowledge bases, it is argued that innovation support and related policies need be mindful of these different kinds of innovation (Asheim, Boschma, & Cooke, 2011). Change happens when people are locally empowered to think about potential regional strengths. Then, they can plan a way towards securing and promoting these by facilitating crossover between various sectors while also encouraging diversity.

An illustration of these processes is the "Preseli Platform" in West Wales, which sought to advance the very heterogeneous sectors of food production and consumption, tourism, textiles and maritime activities through practices such as connecting knowledge institutes to firms or training and attracting talented people (Cooke, 2006). The overall result expected of CRA was that every region would have identified its individual strength, leading to the emergence of a source of unique competitive advantage.[5]

Smart specialisation

The smart specialisation approach proposes national and regional intervention and investments in areas that "create future domestic capability and interregional comparative advantage" (Foray, David, & Hall, 2009, p. 1). The focus of smart specialisation is on "entrepreneurial discovery processes" (EDPs) through which economic sectors with current and future potential to drive regional development are identified (Foray, David, & Hall, 2009; McCann & Ortega-Argilés, 2013). In these EDPs, stakeholders identify potential research and development opportunities as well as innovation domains in their respective regions; survey

[5] For further information on CRA, review the work of Asheim, Boschma, and Cooke (2006) and Asheim, Boschma, and Cooke (2011).

technological and market opportunities; recognise bottlenecks; and articulate obstacles to development (Boschma, 2013, p. 6).

Accordingly, smart specialisation takes place when regional stakeholders are encouraged to make decisive and informed choices regarding which sectors/areas to specialise in, while policy makers provide the supporting instruments.[6] It is hoped this would likewise compel policy makers to select policy interventions tailored to specific regional settings and opportunities rather than following the latest trends or "borrowing" policies from elsewhere (Pugh, 2014). Thus, "regional stakeholders from business, government, research/training and civil society, each of which holds different elements of the knowledge required to make good decisions" (Aranguren, Magro, Navarro, & Wilson, 2019, p. 2) are critical within the EDP. Collectively, they are to define specialisation areas and serve as "entrepreneurial path finders", leaving policy makers with the more modest duty to let the different stakeholders find their own solutions in a more decentralised way (Foray, David, & Hall, 2011).

It is this "clear policy-prioritization logic which is well suited to promoting innovation in a wide variety of regional settings" (McCann & Ortega-Argiles, 2015, p. 1292) that has made smart specialisation an appealing approach to European policy makers seeking to stimulate innovation in all regions (Foray, 2017; Foray, David, & Hall, 2009). In the 2014–20 programming period for the European Structural Funds, having a smart specialisation strategy in place was an eligibility criterion to receive funding, and the approach has been widely implemented across Europe. Nevertheless, there remains some dispute over its applicability to all kinds of regions, notably regions with unfavourable economic structures that have less potential to diversify (Boschma, 2014). There is also evidence that regional policy makers have, in some cases, been resistant to this nudge towards discontinuing older sectoral support strategies, sometimes instead merely badging their older clusters as entrepreneurial discovery led networks (Pugh, 2014). More generally, policy makers have often pre-identified economic activities with regional potential, thereby restricting the entrepreneurial discovery

[6] For additional information and examples of policy instruments used within the smart specialisation framework, review the Smart Specialisation Platform (2018).

process to these predefined areas rather than allowing for it to be fully open-ended as intended (Crespo, Balland, Boschma, & Rigby, 2017).

2.1.4 Institutional entrepreneurs solving the periphery problem of intuitional rigidity

While the above mentioned concepts—focused on activating agency— provide an explanation for how peripheral industrial regions could change their own positions, we argue that they might not work in less successful peripheral regions that often face particular institutional challenges. Rodríguez-Pose (2013) has pointed out that while cooperation between partners can work in some regions, this cooperation and interaction has stalled in other places due to various factors. Indeed, these regions suffer from institutional rigidity characterised by fewer connections between partners, fewer occasions for useful interactions and an absence of policy to stimulate such interaction. Following this line of argument, the regional development problem for peripheral regions in the knowledge economy is quite generally a problem of institutional rigidity.

In the following, we look at how and by whom this institutional rigidity problem could be solved. A commonality we can detect from the existing literature is that institutional problems seem to be solved when particular agents—working within the existing system or networks—do something to construct a new regularity with systemic properties. For instance, Hansson, Husted, and Vestergaard (2005) have demonstrated how science parks can solve institutional problems when they are placed "within the institutional framework of existing higher education institutions" (p. 1048). In their study on the Canadian region of La Pocatière, Doloreux and Dionne (2008) found that "community entrepreneurs", or "organized actors who envision new institutions as a means of advancing interests which they value highly for the development of their community" (pp. 274–276), are vital for regional change and can counteract the institutional problems of the periphery. In line with this, Zukauskaite, Trippl, and Plechero (2017, pp. 330-333) have highlighted that more consideration needs to be given to a larger variety of key individuals when aiming to understand the development of institutions. In this thesis, we will turn our attention to key individuals who shift existing networks to create new systemic properties, and we will examine

their interventions as potential "solutions" to the institutional problem of the periphery.

Institutions have been a recurring concept in innovation studies and economic geography, with scholars aiming to create a broader understanding how they impact the evolution of regions (Gertler, 2010; Martin, 2017). In this thesis, we follow North (1990) and Harrison (1992) in understanding institutions as "the rules of the game" that are created and changed by humans. Thus, institutions are regularities that facilitate particular kinds of action, and in the innovation context, this means we focus on those informal or formal arrangements that may (or may not) facilitate access to knowledge resources by actors that are not already connected.

Understanding institutions as actors and ties—a fundamentally static framework—we introduce institutional entrepreneurs as those agents that bring back dynamism and potential change to the institutions (ties between actors) through the facilitation of knowledge spill-overs (Garud, Hardy, & Maguire, 2007; Sotarauta & Pulkkinen, 2011). More specifically, we focus on the role of institutional entrepreneurs in order to identify how these ties between actors can be created in relatively sparse, peripheral innovation environments with a tendency to remain on the path of inertia and institutional rigidity rather than sifting towards diversification (e.g., of the industrial or technological kind).

With the focus on institutional entrepreneurship, we also aim to answer recent calls for a more agency and micro-process centred analysis of regional development and institutional economic geography (Asheim, Grillitisch, & Trippl, 2016; Gertler, 2010; Uyarra, Flanagan, Magro, Wilson, & Sotarauta, 2017). We have thus selected institutional entrepreneurship as our focus since it offers a constructive lens and a suitable way to makes sense of how the institutional rigidity problem can be solved, and how regional change can be encouraged.

As pointed out by Edquist (2010), it is key individuals who can construct effective improvements to regional innovation arrangements on the micro-scale level. Following a recent tendency (van den Broek, Benneworth, & Rutten, 2019), we refer to what these institutional entrepreneurs do—the act of creating new relationships that require recurrent consistency—as institutional

entrepreneurship. Thus, in line with Leca, Battilana, and Boxenbaum (2009), we emphasise that institutional entrepreneurship offers a "way to reintroduce actors' agency to institutional analysis" (p. 3), with the added purpose of reintroducing dynamism. Accordingly, we perceive institutional entrepreneurs as key individuals/groups of individuals who can mobilise skills, resources, and other individuals while de-legitimising existing institutional arrangements and creating new ones (Battilana, Leca, & Boxenbaum, 2009; DiMaggio, 1988).

Despite challenges such as "rigid structures, politics, major economic layers, and formal policies" (Sotarauta & Pulkkinen, 2011, p. 101) that can potentially hamper the work of institutional entrepreneurs, they are still the most likely to achieve change. They bear the potential to initiate change processes and then vigorously participate in their implementation. Indeed, following Grillitsch and Sotarauta (2019), we suggest that by creating and/or transforming institutions, institutional entrepreneurs have the potential to not only solve the institutional problems identified, but ultimately improve the regional innovation environment.[7]

2.2 Universities and knowledge-based development

2.2.1 How can universities contribute to path-shifting activities?

In this PhD thesis, we focus on the dynamics of groups of actors who seek to create new positive regional futures, which, following Benneworth (2007), we refer to as regional innovation coalitions (RICs). In similar contexts, these groups have been termed "interinstitutional partnerships" (Silva, Teles, & Rosa Pires, 2016), "regional partnerships" (Svensson & Östhol, 2001) or "multi-level partnerships" (Morgan & Nauwelaers, 2003), with such terms consistently referring to groups of actors from different organisations (e.g., regional authorities, companies or universities) who work together within a collective creative process. These coalitions come together at a particular point in time and seek to steer the regional trajectory, ideally leading to an upgrading process through path extension and creation. RICs exert what Sotarauta (2014) has called

[7] This subsection presents the summary of an argument that we present in more length in Nieth and Radinger-Peer (*forthcoming*).

soft/emergent regional leadership in these creative processes within and outside of formal bodies; they align resources, and ultimately have the potential to initiate path development (Benneworth & Nieth, 2018).

In the context of the knowledge economy, RICs can be important because knowledge can be advanced and exchanged within them. However, it is not only the exchange of knowledge that matters; the creation of a collective knowledge base between the partners is crucial, as this constitutes the basis for joint action. The new knowledge created through cooperation is then made available to other regional partners, a process that upgrades the region significantly (Benneworth & Pinheiro, 2015). An illustration of how this creation of a joint knowledge base can facilitate a regional development process is provided by Lester and Sotarauta (2007), who show how the regional innovation coalition of the Tampere region constructed a new future for itself following the collapse of the Finnish economy in the early 1990s. They highlight how various groupings of local actors worked as "strong mobilizing forces" and reached common goals, like the attraction of a new regional university which later played a significant role in the region's development (Lester & Sotarauta, 2007).

Universities are seen as important actors participating in these partnerships, regional upgrading processes and future-creating activities, thus contributing directly to improving the regional innovation capacity (Benneworth, Charles, & Madanipour, 2010; OECD, 2007). In their specific role as knowledge creators and circulators (Yigitcanlar, 2010), universities may produce and distribute knowledge through, for instance, the commercialisation of knowledge (e.g., in the form of patenting or spin-offs), collaboration with companies (e.g., in joint projects or consulting) and informal knowledge exchange (e.g., through networking activities).

Nevertheless, cooperation between different partners is not a straight-forward process that is realised in a "happy family setting"(Lagendijk & Oinas, 2005b), particularly in cases where actors have different strategic goals and make their own strategic decisions depending on the priorities that they themselves have defined. Benneworth and Pinheiro (2015) highlight that the process of creating these types of strategic partnerships is not straight-forward, as the partners within

RICs have different goals and make their own strategic decisions depending on the variables that they have defined.

When looking at the role of universities from an EEG perspective, we can see that universities are actors that help create new development paths, stimulate the transition from old to new paths and assist in the avoidance of lock-in scenarios as well as institutional rigidity (Benneworth, Young, & Normann, 2017). While universities are depicted as essential within RICs—seeking to create new regional pathways—it is their constituent of academics or managers that can be proactive in establishing, developing and even leading specific coalitions.

A second diagnosis of the university role is that any kind of path development process is often directly related to changes in the knowledge infrastructure, within which universities can represent major players (Tödtling & Trippl, 2012). Thus, path renewal may lead to new universities being created to support emerging sectors with highly-skilled staff and knowledge transfer. New path formation may be associated with universities if they have particular technological breakthroughs that can be exploited; if they help bring in new technologies into the region to create new sectors; or if firms and universities work together closely and dynamically to drive the creation of new sectors. Path creation "preconditions a major transformation of the regional knowledge infrastructure" (Tödtling & Trippl, 2012, p. 7), which often means that regional universities are actively reconfigured by the emerging new sector or in close proximity of government-funded research laboratories that complement what universities can contribute.

2.2.2 The limits to university contributions

As Benneworth, Pinheiro, and Sanchez-Barrioluengo (2016) argue, there are no "one-size-fits-all" models for understanding/directing (regional) university contributions. Furthermore, regional stakeholders often encounter the practical problem that universities are reluctant or problematic partners within regional collaborative activities, undermining the potential impact of their engagement. In the following sections, we point out two elements that have an impact on how

universities can (or cannot) contribute to regional innovation activities and coalitions.

Strategic overload

Our first determination is that these problems of universities not responding to external expectations only make sense when understood in the context of a proliferating number of policy goals to which universities are expected to contribute (de Boer *et al.*, 2017). The resultant "mission stretch" (Scott, 2007) can accentuate the tensions between global competition (based on academic excellence and defined by international standards) and regional demands to follow policy agendas for societal impact and relevance (Krücken, Kosmützky, & Torka, 2007). With these multiple missions for universities, the argument has been made that the regional mission runs the risk of being "crowded out" by universities' core missions of teaching and research and, in particular, the added pressure to excel internationally in these core activities (Benneworth, Young, & Normann, 2017; Pinheiro, Benneworth, & Jones, 2012). Additionally, this emerging rhetoric, that universities need to be world-class, excellent, and global citizens (Salmi, 2009), comes with the added risk that regional engagement is something for "second rate" academics who cannot do research on par with international standards of excellence (Akker & Spaapen, 2017).

These strategic tensions may reduce the willingness of universities to invest in activities for regional benefit that do not otherwise contribute to their other missions. At the same time, universities may face the challenge of investing substantially in activities for regional benefit that may, in turn, leave them overspecialised in regional-facing activities for which there is no obvious partner. Alternatively, universities might face other, more urgent pressures (such as internationalisation) that see them unable to devote adequate resources to these local-facing endeavours. Universities might unintentionally become strategic actors in development processes, with other actors placing high expectations on them simply because they are so important to regional innovation processes. Smaller universities may have a primarily local, town-level impact, and for countries with large sparsely populated regions (such as Norway), they may face

some difficulty in managing the tension between their local obligations and the expectations of wider regional impact (Karlsen, 2018).

Diverse challenges have been identified with respect to the varied missions and intentions that put pressure on universities. One challenge in particular is that universities have been portrayed as manageable and strategic organisations that are able to "respond in a well-articulated (i.e. strategic), efficient, and socially-accountable manner" to demands that are not only complex, but often contradictory (Pinheiro, Benneworth, & Jones, 2015, p. 154; Uyarra, 2010). Regional actors expect that universities are able to "help the region" and cooperate seamlessly to reach common goals. Diverse factors (e.g., the degree of alignment between research topics and the needs of the region, the history of engagement and the types of regional businesses) have an impact on the degree of engagement (Gunasekara, 2006).

This complex situation is true for all kinds of external engagements, but it can be particularly prevalent in regional engagement, where universities are cooperating with partners that are physically nearby, rather than those that are necessarily optimal for the knowledge creation at hand. Thus, while universities are strategically overloaded in facing diverse pressures that are often not compatible with regional engagement, these tensions may even be exacerbated in peripheral regions (Section 2.2.3).

Loose coupling

This strategic mission overload is aggravated by the fact that universities are not strategically simple organisations. They are knowledge-producing bodies with very decentralised organisational structures, often being described as "loosely coupled" (Weick, 1976). Accordingly, different academic disciplines and areas—Becher and Trowler (2001)'s "academic tribes"—have very different approaches to creating new knowledge (research), transmitting knowledge (teaching) and transferring knowledge (valorisation).

Universities, therefore, must find formal and informal ways to simultaneously accommodate these different practices within singular organisational structures. Attempts by universities to develop a singular knowledge transfer strategy risks

failing to capture the diversity of engagement practices across these different academic communities. Indeed, it is particularly complicated for university managers to produce singular engagement strategies that will have the desired effect of encouraging and facilitating their staff to drive regional development, and hence to deliver engagement.

Universities' institutional architectures are thus comprised of different elements (see, for instance, Benneworth, Pinheiro, & Karlsen, 2017; Clark, 1998; Nedeva, 2008), with each element contributing to regional activities and cooperating with regional partners in different ways. When considering the regional engagement of universities, there is a tendency to focus on the senior managers and leaders (the strategic core) who make the engagement strategies, often leaving out the fact that cooperation and knowledge exchange is realised by engaged individuals (operational hinterland; Figure 2) in the majority of cases (Pugh, Lamine, Jack, & Hamilton, 2018).[8]

2.2.3 The limits of university contributions to regional innovation coalitions in the periphery

We see a clear potential for universities in peripheral regions to contribute to wider coalitions of interested actors in the public, private, and societal sectors. Nevertheless, although universities could potentially play active, constructive roles in creating new regional futures, the tensions they face may prevent them from making those contributions and restrict them all too often to directly contributing academic knowledge (Benneworth, Coenen, Moodysson, & Asheim, 2009). There are a number of tensions that might play a restrictive role on the contributions of universities, and we unpack a selection of these in the following and in Table 2.

[8] An in-depth analysis of universities' institutional structures and elements is presented in Chapter 6 of this thesis.

TABLE 2. TENSIONS RELATED DIRECTLY TO UNIVERSITIES FOR PERIPHERAL REGIONS[9]

Tensions related to the role of universities	**Author**
- Cooperation and transfer of technologies between R&D centres, universities and the private sector are less developed.	Doloreux (2003)
- Imbalance in science and technology in favour of the public sector, and the academic sector in particular.	Landabaso and Reid (1999)
- Little or low-profile knowledge generation and diffusion through universities/research organisations. - Education/training with an emphasis on low- to mid-level qualifications. - "Thin" structure of knowledge transfer; lack of more specialised services, and often too little orientation on the region's needs.	Tödtling and Trippl (2005)

SOURCE: AUTHOR'S OWN ELABORATION

One significant challenge is the fact that many times, the academic knowledge of universities is of latent value for the region, and is thus not actively used by regional partners (such as firms or public organisations). This divergence may transform universities into "cathedrals in the desert" (Morgan, 1997). Charles (2016) explains that it can be even more difficult for universities in peripheral regions to support the local economy because businesses tend to be smaller, the economic base is diverse and there tends to be a lower number of knowledge institutes. Additionally, clear articulation of what industry demands from universities—a prerequisite for any interaction or knowledge transfer— is often not guaranteed by SMEs (habitually the main economic players in peripheral regions). Jongbloed, Enders, and Salerno (2008) argue that SMEs face particular challenges in articulating their needs accurately to their partners (such as universities), which often hinders successful knowledge exchange.

Universities are thus dependent on well configured regional partners in regions that most frequently lack them. Similarly, the European University Association (2014) has explained that universities as important partners in regional strategies can only take those strategies further "in partnership with other stakeholders in the region" (p. 9). This creates a chicken and egg situation where universities can help the regions only if there are already well configured regional partners to help

[9] This table is not aimed at being comprehensive or displaying a complete literature review of the tensions directly relevant to universities in peripheral regions. Instead, it summarises dominant examples of the various types of tensions that have emerged in the policy literature.

them. Of course, it is precisely the peripheral regions that lack those strong, well configured innovative institutional settings that are necessary to achieve path development (Huggins & Johnston, 2009). Thus, we need to understand how universities in the periphery can create opportunities to mitigate path inertia and ease the tensions in peripheral regions. Table 3 outlines some of the first ideas on how to do so that have been identified in the literature.

TABLE 3. POSSIBLE RESPONSES OF UNIVERSITIES TO PATH INERTIA

Tensions that can lead to path inertia in peripheral regions (from Table 1)	**University contribution to ease path inertia**
- Lack of actors and support organisations. - Dominance of SMEs.	- Upgrading the capacity of existing SMEs and creating improvements in the regional skills base by offering specialised courses that are in line with the needs of regional companies.
- Mismatch between the regional supply of innovation and the demand for it. - Less developed in terms of the innovation interface: incremental, small-scale innovations and innovation through the application of existing knowledge through new combinations of knowledge.	- Focusing research on regional contents. - Making research agreements with regional actors.
- Cooperation and transfer of technologies less developed. - Little or low-profile knowledge generation and diffusion. - Education/training with an emphasis on low- to mid-level qualifications. - "Thin" structure of knowledge transfer. - Lack of more specialised services; often too little orientation on the region's needs.	- Creation of a suitable business support infrastructure (technology transfer centres, regional development agencies, universities, etc.) with active participation of the university. - Knowledge exchange in regional innovation coalitions led by universities. - Creation of new kinds of knowledge through coalitions and the sharing of this knowledge.

SOURCE: AUTHOR'S OWN ELABORATION (BASED ON TABLE 1)

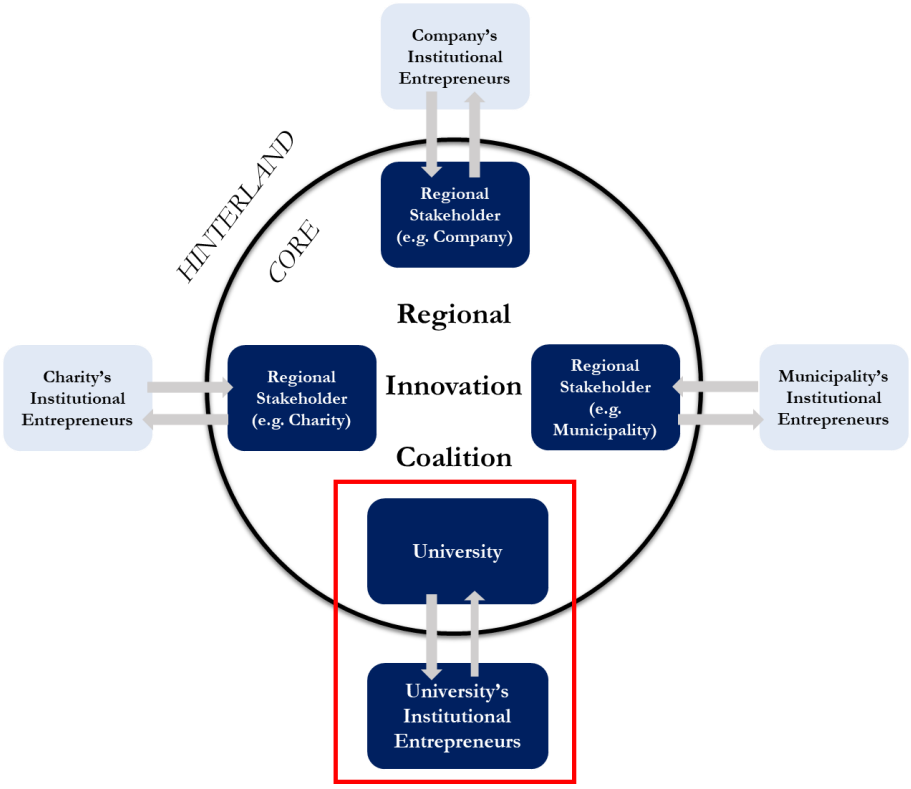
2.2.4 University institutional entrepreneurs addressing institutional rigidity in the periphery

This thesis focuses on the way regional innovation coalitions can contribute to path development through institution building as a response to institutional rigidity. This institution building process is currently thought of as taking place within the core of the regional innovation coalitions (Figure 2), neglecting the role of the hinterland, or the institutional entrepreneurs (IEs). The IEs from different organisations thus relate to each other, being not completely

constrained by their institutional structures; instead, they have the capacity to exert agency.

As we highlighted above, there is the general assumption that institution building takes place at the strategic core, while this thesis demonstrates that it is indeed the hinterland engaging with the strategic core that builds institutions (Figure 2). In fact, there is this four-way interplay between partners at the strategic and operational level that we are going to term a "regional innovation institution building arena" (RIIBA).

FIGURE 2. UNIVERSITY INSTITUTIONAL ENTREPRENEURS AS INSTITUTION BUILDERS IN RIIBAS



SOURCE: AUTHOR'S OWN ELABORATION

While there is a duality to all the stakeholders within the RIC—and the interaction between the other stakeholders and their specific institutional entrepreneurs might also be of interest in this respect—this thesis specifically

focuses upon the university element (displayed in the red box in Figure 2). Thus, we aim to understand how university agents build new institutions and thereby contribute to the reduction of institutional rigidity in the periphery. With this aim in mind, we sought to determine how individuals within universities can develop innovation activities and exchange knowledge with regional partners in relationships that have the potential to develop into new systematic, institutional opportunities for regional economic development (Battilana, Leca, & Boxenbaum, 2009). Accordingly, we focus on these acts of institutional entrepreneurship within one particular organisation. The strategic overload and loose coupling of universities clearly affects their performance in RICs, and their operational staff in the hinterland is not easily understood by strategic managers in the core. Additionally, we build on a particular element that has been widely ignored in the literature, with some noteworthy exemptions, such as Pugh *et al.* (2018) analysing the role of individuals in entrepreneurship departments, and Benneworth, Pinheiro, and Karlsen (2017) analysing how the institutional organisational context affects individuals' capacity to exercise institutional change (see Chapter 5 for a fuller treatment of this point).

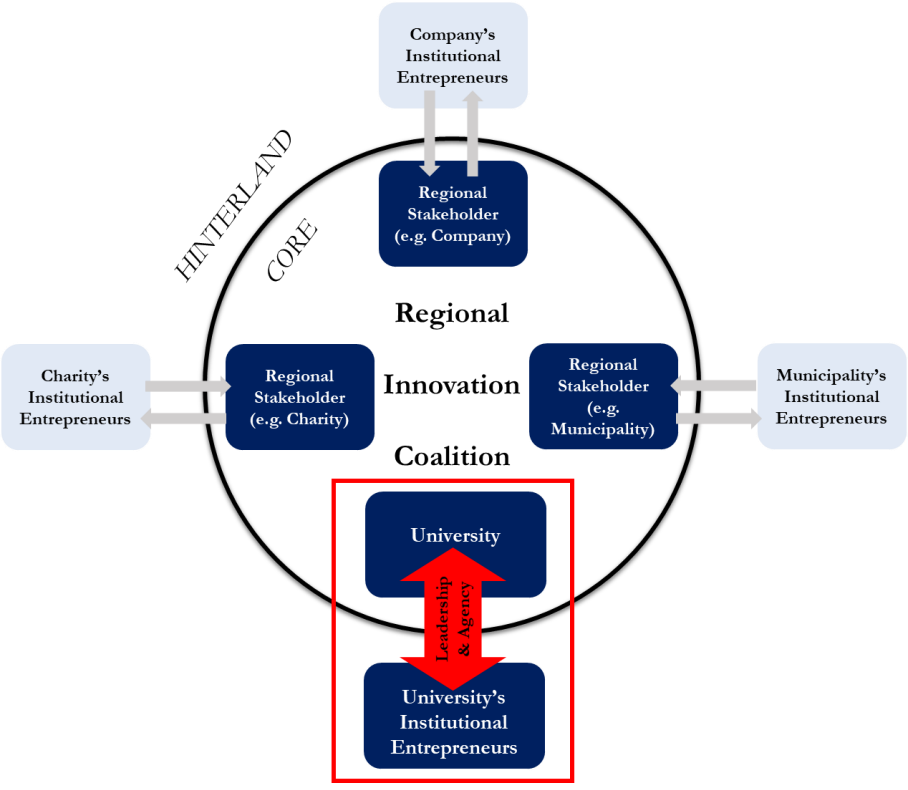
2.3 Literature gaps and conceptual delineations

In this thesis, we are concerned with the dynamics within universities between what we conceptualise as the strategic core and the operational periphery that affect the roles that universities play within RICs. To do this, we identify two main assumptions that have been made in the existing literature regarding the ways that those dynamics play out, and we therefore sought to explore those two assumptions in more detail. The first assumption is that universities as regional leaders not only make commitments to regional partners but also direct their staff about what to do. The second assumption is that the actions that university operational staff take are directly in pursuit of the strategic goals determined by the core.

With this in mind, this section identifies two important lacunae, **regional agency** and **regional leadership** (indicated in Figure 3 with the red arrows), that form the nature of universities as organisations where the configuration between the

core and the hinterland (or the strategic and operational levels) can be especially complicated. So, organisations create institutions, and institutions traverse the boundary between organisations, but the different parts of the organisation (strategic and operational) are not necessarily working in tandem, especially in the case of universities. With this in mind, we examine how universities shape the context in which their institutional entrepreneurs operate, and how institutional entrepreneurs give universities the capacity to make legitimate promises in the strategic elements of the arenas.

FIGURE 3. RIIBAS AFFECTED BY AGENCY AND LEADERSHIP



SOURCE: AUTHOR'S OWN ELABORATION

Sections 2.1 and 2.2 represent two very different bodies of literature, which come from rather divergent perspectives. Overall, we claim that there has been a tendency to couple them together with a kind of optimism bias. Indeed, in the discussions where these two literature blocks come together, it is rather habitual

to expect the best rather than fear the worst. More specifically, there is a tendency to expect that it is a relatively trivial task for universities to contribute to institutional development in the periphery and address institutional rigidity, and such an optimistic perspective overlooks the problems of strategic disconnect and loose coupling.

Consequently, there has been a propensity not to consider the difficulties and/or those situations where these links are not automatic. Indeed, we have seen that the failures of these regions to deliver effective regional innovation improvements has often been ascribed to an apparent deficiency to be like best practice regions; as such, there has been little consideration of the specificities of certain places that have exhibited particular shortcomings (Cooke, Boekholt, & Tödtling, 2000; Nauwelaers & Wintjes, 2002; Tödtling & Trippl, 2005). It is often assumed that interactions and exchange processes within these RIIBAs operate smoothly, and that all partners will work together to develop institutions that can solve institutional rigidity problems. We regard this as a "heroic" assumption, and now turn to the two areas where tensions may arise, thus undermining the capacity of universities to effectively contribute.

2.3.1 Gap: Agency[10]

As we have already established, we perceive institution building as the mechanism that supports regional development for innovation in peripheral regions. In this setting, one way to achieve institution building is through institutional entrepreneurship, which is to be understood as a form of processual and collective agency (Leca, Battilana, & Boxenbaum, 2009). Thus, agency can be seen as a force that can shape "the change and reproduction of institutions" (Lam, 2010, p. 335) as well as capabilities and networks through micro-processes and collective action, thereby breaking with structural and institutional preconditions (Grillitisch, Asheim, & Nielsen, 2019, p. 36). In this thesis, we adopt the view that the "strategic, distributed, and foresightful agency" (Grillitisch & Sotarauta, 2018, p. 5) of individuals, groups of individuals and

[10] The following two subsections (2.3.1 and 2.3.2) present the summary of arguments presented in more length in the empirical chapters of this thesis.

organisations can be a key driver for regional change as well as path development processes (Dawley, 2014; Grillitisch, Asheim, & Nielsen, 2019).

The knowledge gap identified here regarding agency is related to the tendency to assume that individual agents operate in relatively unconstrained ways to create activities that have general regional benefits.[11] In contrast to that assumption, and in reality, individual agents operate in institutional and network contexts within which they can be constrained by different actors, structures and elements. We detect a disposition to screen out one or the other of these elements. On the one hand, it is assumed that these individuals are representatives of a parent organisation and are completely dominated by the interests and the strategic agenda of that organisation. On the other hand, it is assumed that these individuals are characters in networks who effectively have a very high degree of freedom from their organisational context to reshape those networks and create institutional capacity.

This ambivalence is inherently unsatisfying, especially in the case of universities, where the strategic agendas are never clear or singular, and the different actors within the university are part of diverse communities that do not always interrelate easily (Section 2.2). Typically, academic agents operate between global and local networks and in often rigid national regulatory systems. For instance, their teaching activities are shaped by national accreditation systems, and their research is shaped by national research evaluation and funding systems as well as international research/disciplinary trends. To date, there has been a tendency to assume that university agency lies with senior management, and that effective regional engagement starts with those managers identifying "regional needs" with which the university can align as an institution. Thus, the role for individual staff members/academics becomes reduced to implementing what those senior principals demand (in a top-down structure). In contrast, we contend that effective regional engagement involving knowledge activities must be initiated by individual academics building links with regional partners in ways that allow that knowledge to flow. Here, the role of senior managers is to change universities in

[11] Additionally, it is often overlooked that agents might not always work to achieve direct regional ends because they themselves have other priorities and commitments.

ways that allow for those academics to develop connections that support the underlying knowledge activity (a bottom-up approach).[12]

2.3.2 Gap: Regional leadership

As has been demonstrated and discussed in some detail (for instance by Beer & Clower, 2014), regional leadership is recognised as an increasingly important element of institutional building processes in regional development. The gap with respect to leadership that emerges from our model is related to the nature of the dynamics/interactions within the core, and the presumption of the biddability of those actors in the hinterland. While it is often suggested that the dynamics/interactions of the core are of most importance (what Grillitsch and Sotarauta (2019)call the "fallacious heroic leadership discourse" (p. 9)), new leadership theory clearly shows that leadership capacity involves the mobilisation and coordination of actors beyond the interests of individual organisations (Sotarauta & Beer, 2017). Regional leadership can thus be described as collective as well as individual, invisible as well as open, formal as well as informal and a strong as well as a weak process (Sotarauta, Beer, & Gibney, 2017).

What the current understanding of leadership still seems to overlook is the point that what the leaders/core can offer is based upon what is operationally deliverable. In turn, what is operationally deliverable is based upon what the operational actors (of the hinterland) are willing to do. This challenge comes particularly to the fore in relation to academic actors—active in global networks and knowledge processes— who thus have no given interest in or commitment to regional engagement.

This thesis identifies an additional lacuna in relation to leadership in those cases where there are a large number of loosely coupled organisations, such as universities. In these cases, there is neither a single strategic interest, nor can "the university" as an abstract entity compel individuals to do particular activities, follow predefined goals or act in the overall interests of "the university" itself (Fonseca, Nieth, Salomaa, & Benneworth, forthcoming). The steering core can

[12] Elements of this section have appeared in Nieth and Benneworth (2019) in Chapter 5 of this thesis.

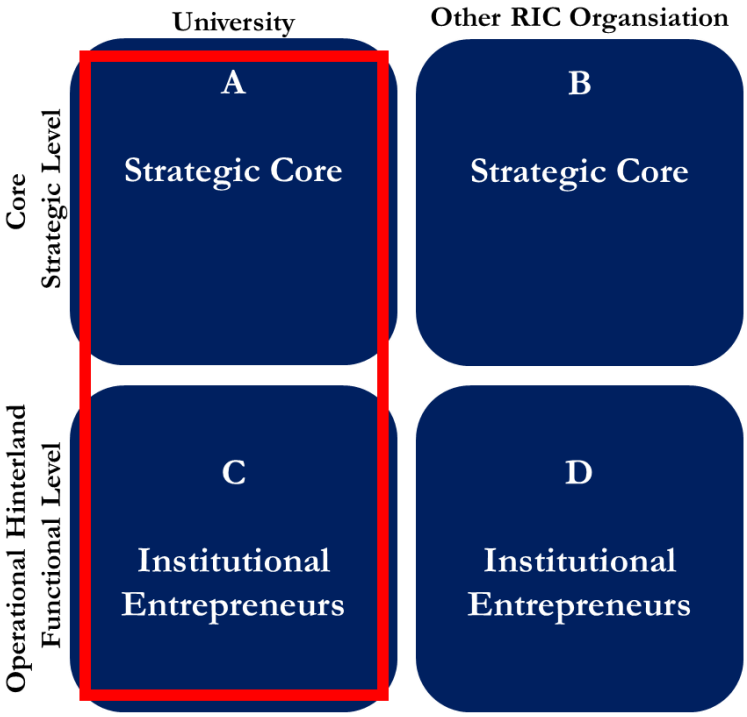
indeed do things on its own behalf, but these practices are often not the knowledge processes that are regionally of interest. Therefore, the steering core must bring the operational layer along with them. This point is tightly linked to the concept of agency, in that "the university" is dependent on individuals with their own priorities and loyalties, some of which may potentially deviate from those of the overall organisation (Marques & Morgan, 2018). The complex internal and institutional structures of universities can thus either undermine their capacities to enact coherent regional leadership roles, or they can allow them to play a stronger multidimensional role if the strategic promise is matched synergistically with their operational capacities.

2.3.3 Summary and refined research question(s)

The aim of this thesis is to analyse the role of universities in RICs and understand the factors that influence the dynamics of these roles in order to better understand their contributions to regional development (Section 1.2). Our diagnosis as of Section 2.1 is that the reason for this lack of path development is institutional rigidity in the periphery. We then emphasised the role of universities and claim that they can indeed contribute to overcoming institutional rigidity through acts of institutional entrepreneurship (Section 2.2.). However, for university institutional entrepreneurs to be able to contribute to solving this institutional rigidity problem, they need to be enabled by the strategic actors in what we have termed "regional innovation institution building arenas", or RIIBAs. Having conducted an extensive literature review framed by the overall research question introduced in Chapter 1, we can now operationalise this question into the following: *How and under which conditions can institutional entrepreneurs of universities address institutional rigidities in peripheral regions?*

In order to answer this question in a qualified and clear way, we break it down into three key areas/sub-questions of interest. As explained above, there has been a trend of exclusively focusing on the interaction in the core (A–B, Figure 4), while we argue that there are (at least) three other sets of relationships, interplays and/or connections between the different elements (A, B, C and D) that need to be considered.

FIGURE 4. VISUAL ILLUSTRATION OF THE MAIN ELEMENTS



SOURCE: AUTHOR'S OWN ELABORATION BASED ON FIGURE 3

The first key area displays the way in which the process of decision and strategy making functions, taking into account that both processes tend to be conceptualised as taking place between the core actors. In contrast to this conceptualisation, we have outlined that what the universities' cores can do/offer is constrained by what their institutional entrepreneurs in the hinterland are able/willing to do. The first sub-question is thus formulated as follows: *How does strategy making function in RIIBAs?* The focus of this sub-question is on the way in which the interactions within the university affect a university's strategic behaviour in the RIIBA (A-B-C).

The second key area represents how university IEs operate with the institutional entrepreneurs of other organisations. We focus in particular upon the levels of autonomy the IEs from the university have in the development of their interactions, while at the same time being either constrained or empowered by

their organisational setting and/or organisation's core (C-D-A). The second sub-question is formulated as follows: *How do university organisational structures/frameworks affect IEs' behaviour (with the rest of the hinterland)?*

Finally, the third key area deals with the mismatch between the operational and strategic tiers, and how operational mismatches affect the strategic perception of the university as well as the performances of the partners in the RIIBA (C-D-B). Typically, it is the university's operational tier (C) that is criticised from the outside (B). Thus, we aim to understand the dynamics of the hinterland and how that affects the behaviour of the university-external core. The third sub-question is as follows: *How do organisational mismatches affect RIIBA processes?*

The six empirical chapters (4–9) of this thesis all contribute to filling the outlined knowledge gaps and address the three sub-questions to different degrees (Figure 18). The framework and the sub-questions thus provide a means by which to answer the main operational question and will lead us to the development of a more dynamic model (Chapters 10 & 11).

3 METHODOLOGY

In what follows, we will explain the approach to this dissertation's ontology (what is real/what is there to know), epistemology (our knowledge of reality/what constitutes this knowledge), methodology/research design (how we can obtain that knowledge) and methods (where and how we are to collect and analyse the data). The aim of this chapter is to show how the knowledge that has been created is valid with respect to answering the research questions.

3.1 Philosophical positioning

When considering the research questions and the framework introduced, it becomes clear that this research is neither aiming at identifying "generalisable laws" (positivism), nor at identifying "the lived experience or beliefs of social actors" (interpretivism) (McEvoy & Richards, 2006, p. 69). Instead, we aim to develop a profound understanding of universities in regional innovation coalitions and identify explanations of the processes in which they participate in regional development. Since this qualitative, exploratory research is seeking to reveal the nuances of the processes in a complex, uncertain system, the framework does not lend itself to a form of operationalisation that depends upon quantifiable data or a robust explanatory approach. Thus, the critical realist perspective seems to be the most appropriate to uncover the underlying mechanisms of these processes and to illuminate the regularities while still accounting for contextual differences.

With this project being grounded in the critical realist paradigm, we defend the idea that an objective, deep reality exists, but that human understanding of it and access to it is limited due to the nature of our own subjectivity (Guba & Lincoln, 2005). Bhaskar (1978) distinguishes between three different ontological domains of reality: the empirical, the actual and the real. First, the empirical level is the realm of phenomena/events that are experienced directly or indirectly through the senses. While these can be registered empirically, they are "mediated through the filter of human experience and interpretation" (Fletcher, 2017, p. 183).

Second, the actual, encompasses phenomena that occur, but that may not be experienced; therefore, they are not filtered through human experience. Finally, the real are those structures and mechanisms that have the potential to generate phenomena/events.

Thus, from a critical realist standpoint, the ultimate goal of social science—to explain and apprehend reality—cannot be reached completely because observations and explanations of reality, either on the part of the research participants, the theorists or the scientists, are "fallible" (Easton, 2010; Fletcher, 2017). Thus, reality is not only complex, stratified and differentiated (Bhaskar, 1978), but it can also be defined as an "open system" that is characterised by some degree of ambiguity and uncertainty against which causalities can only be understood as tendencies (Sayer, 2000).

Consequently, what the researcher can do is to "go beyond what is directly observable within the domain of the empirical" (Bergin, Wells, & Owen, 2008, p. 172) and create an idea of the "big picture" through the capturing of different fragments of the reality, while at the same time building on existing fragments that have been identified and discussed in the research community. A key outcome of a critical realist approach is therefore to "modify, support, or reject existing theories to provide the most accurate explanation of reality" (Fletcher, 2017, p. 190). Thus, the conceptual model presented in Chapter 2—consisting of concepts, relations and dynamics—will be related to the concepts, relations and dynamics of the empirical data (Chapters 4-9) in a systematic way. We therefore compare the conceptual architecture of what we find with the conceptual architecture proposed in the theoretical framework. Thus, on the basis of the synthesis (Chapter 10), we perform the reconceptualisation (Chapter 11) and reflect on the way the conceptual framework needs to be modified in light of the findings. Accordingly, the empirical chapters of this dissertation (4–9) consist of attempts to illuminate and stylise the processes in question with the aim of formulating insights on the patterns and regularities that will be combined and discussed in the final chapters (10 & 11).

3.2 Research design and methods

3.2.1 Qualitative case study design

Easton (2010) points out that critical realism is a useful ontological position for case study research, as it allows for the analysis of intricate entities and processes. Since our aim is to analyse the complex situation of RICs contributing to regional development processes, and to examine the role of universities within this structure, a qualitative, explorative and in-depth case study approach was suitable (Yin, 2009). Through this approach, we were able tease out the internal complexities and core dynamics of the processes in question, which allowed us to understand the relations between the different elements analysed. A comparative approach was chosen, as this approach enabled us to take different mechanisms, variables and local contexts into account (Bryman, 2012). We did not want to be dependent on one contextual case study; instead, we wanted to review the same process operating in different contexts in order to ensure that we had captured all of the relevant concepts, relations and dynamics introduced.

This dissertation is part of an international project which enacted a multiple case study approach. While the original plan was to conduct the research across two regions, the researcher(s) decided to include a third region, with all three regions being *prima facie* cases for the research. In line with the essence of critical realism, we aimed to identify regularities and tendencies across multiple case studies in a diverse array of contexts. While individual chapters of this dissertation (4 & 5) have singles cases, they produce knowledge about regularities that, in contrast to the knowledge created from the other regions, have allowed us to produce a synthetic story (of the regularities) in the end (conclusion and discussion). A multiple case study approach has enabled us to identify regularities across contextual differences.

The selection of the three cases was performed according to the following criteria: (1) we observed all of the elements introduced in the model in the respective regions; (2) the regions demonstrated long-term and serious efforts in improving their regional innovation environment while (3) developing innovation policies/strategies that involved coalitions of regional stakeholders in

these processes; (4) the cases demonstrated openness and willingness to learn, while being serious and reflective about their development; (5) the cases included young universities aiming to engage with the region, but facing challenges with engagement; and (6) the regions were considered peripheral in their national context. The three selected regions, Twente (Netherlands), Aveiro (Portugal) and North Denmark (Denmark), are introduced and discussed in detail in each of the empirical chapters (see also Table 5 & Table 18).

3.2.2 Methods for data collection (and analysis)

As we wanted to understand the complexities and dynamics of RICs in shaping regional development and the role of universities in this structure, the focus of this study was on processes, practices and situations in their particular contexts. While the information we needed was not written down "somewhere", people could talk about it and delineate the conscious decisions and choices they had made. Therefore, interviews were an appropriate method for data collection in this research and in line with the critical realist approach, which treats "the ideas and meaning held by individuals—their concepts, beliefs, feelings, intentions, and so on—as equally to physical objects and processes" (Maxwell, 2012, p. vii). We wanted to create knowledge about the processes that involve people exerting agency actively and consciously, and the data collected were especially indicative of the decisions that were made. The rationalities people attached to those decisions could then be reconstructed retrospectively. With respect to the semi-structured interviews with key stakeholders, the research made use of documents such as scientific publications, policy papers, progress reports, minutes of meetings, newspaper articles and other similar formats (Table 4). These documents were trawled for information on the processes in question.

Qualitative interviews are a suitable data generation method for this type of research as the researcher can learn about "settings in which [s/he] has not lived" while obtaining detailed interpretations and in-depth descriptions of those respondents who have indeed lived the "situation" under examination (Weiss, 1994, p. 1). The interviewed stakeholders were part of regional coalitions (or knew about these due to interactions with them or participation in them in the past), and they were able to talk about the respective situations in an informed

way. A snowball approach was adopted for the identification of the right interview partners. The number of interview partners in each region was determined by reaching a point of saturation at which no relevant new insights were obtained through the inclusion of more interview partners and/or after the same people were recommended repeatedly. We thereby followed each case study until narrative closure.[13] As some interviews took place after narrative closure, and nothing new was learned in them, these interviews were excluded from this research.

TABLE 4. DATA SOURCES

Data source	Data collected through
▪ Interview transcripts: - 37 interviews in Twente; - 45 interviews in Aveiro; - 37 interviews in North Denmark.	▪ Total of 119 semi-structured interview with key informants.
▪ Scientific publications & grey literature. ▪ Regional strategies and corresponding action plans, sub-strategies, etc. ▪ Minutes from meetings and project reports. ▪ Cooperation agreements. ▪ University strategies at different levels (overall strategies as well as sub-strategies from different departments or research groups). ▪ Newspaper articles.	▪ Contact persons at the regional institutions and universities. ▪ Homepage of the region and/or university.

SOURCE: AUTHOR'S OWN ELABORATION

The dominant recurring themes of the interviews were the dynamics of coalitions; strategy formulation and implementation; the role of universities in coalitions; the role of individuals of universities; and the development of the region as a result of cooperation. Although the precise interview guidelines were adapted to the individual cases, a general overview of the questions can be found in Annex II: Overall interview guide. Interview partners were encouraged to "tell their own story" first and then more specific questions about the way stakeholders engage; the way coalitions form; the problems they encounter; how problems are solved and decisions are made; and the role of the university in the

[13] In terms of closure, the RUNIN project involved site visits to each of the seven regions, and there was a fourth region that could have been involved in this research. Nevertheless, after the site visit, the researcher(s) did not observe any new elements, which provided a hint towards closure. It is therefore not unreasonable to think that an additional case would not have added new information.

region, in joint projects, in strategy building and in implementation were asked. In line with the idea that a semi-structured interview format allows for flexibility to combine existing ideas with new notions (Fletcher, 2017), the interview guide was internalised early on by the researcher in order to create an interview setting similar to an open conversation.

The semi-structured interviews each lasted between 35 and 90 minutes, and interview partners were guaranteed anonymity and confidentiality through the provision of information letters and the signature of consent forms. Additionally, the consent form gave the researcher(s) the permission to record the interview, and the interview respondents were provided with the opportunity to withdraw their contributions from this research project (which did not happen in any case). The researcher received approval for fulfilling the ethical requirements of the Ethics Committee of the Faculty of Behavioural Sciences of the University of Twente. Additional ethical considerations were that interview partners were to have no relationship with the interviewers, and interview partners were asked professional questions to which they were able to answer on their own terms (Bogner, Littig, & Menz, 2009).

The fieldwork was conducted in three stages according to the time frames in which the researcher was seconded to the respective regions and universities: (1) Aveiro, February 2018 to June 2018; (2) North Denmark, September 2018 to January 2018; and (3) Twente, June 2017 to December 2017 (pilot interviews), June 2018 to August 2018 and January 2019 to April 2019. The first phase of interviews conducted in Twente was a series of pilot interviews, which were initiated to test the interview guide and develop a deeper understanding of the research methods as well as the themes addressed in the interviews.

The recorded interviews were transcribed by the researcher, a third-party transcription service or by a student assistant (with the latter two signing non-disclosure agreements and confirming encrypted file usage). Data sets were produced through transcription, and different selections of the data sets were used in adapted ways in the empirical chapters. While detailed descriptions of the analytic methods for each individual paper can be found in the respective

empirical chapters (see also Table 5), the similarities in terms of the analysis will be described in the following.

TABLE 5. CASES, METHODS AND ANALYSIS OF EACH CHAPTER

#	Cases (external)	Methods & analyses
2		- Systematic literature review.
4	- Aveiro, PT - Twente, NL - (Lincolnshire, UK)[14]	- Exploratory-hermeneutic, comparative case study of the effectual and causal elements of regional innovation strategies developed in stakeholder coalitions. - Stylisation of those regional processes through a thick descriptive approach & production of a schematic reading of them.
5	- Aveiro, PT - North Denmark, DK - Twente, NL	- Exploratory, comparative case study of academics as institutional entrepreneurs participating in regional development outcomes. - Application, sharpening and validation of a predefined conceptual framework (pattern identification to further theory building).
6	- Aveiro, PT - North Denmark, DK - Twente, NL - (Lincolnshire, UK - Vallès Occidental, ES - Satakunta, FI)[14]	- Exploratory, comparative case study of universities and their different place leadership roles. - Application, sharpening and validation of a predefined conceptual framework (pattern identification to further theory-building).
7	- Twente, NL	- Exploratory in-depth, single case study of the tensions that can cause regional stakeholders to fail to cooperate. - Deductive knowledge production through thematic analysis combined with a framework approach (pattern identification/stylisation of data to further theory building).
8	- Aveiro, PT	- Exploratory in-depth, single case study of the challenges of knowledge combination in strategic regional innovation processes. - Application, sharpening and validation of a predefined conceptual framework (pattern identification/stylisation of the data to further theory building).
9	- Aveiro, PT - North Denmark, DK - Twente, NL - (Vallès Occidental, ES)[14]	- Exploratory, comparative case study of the roles of universities in creating, implementing and evaluating regional development strategies. - Application, sharpening and validation of a predefined conceptual framework (pattern identification/stylisation of the data to further theory-building).

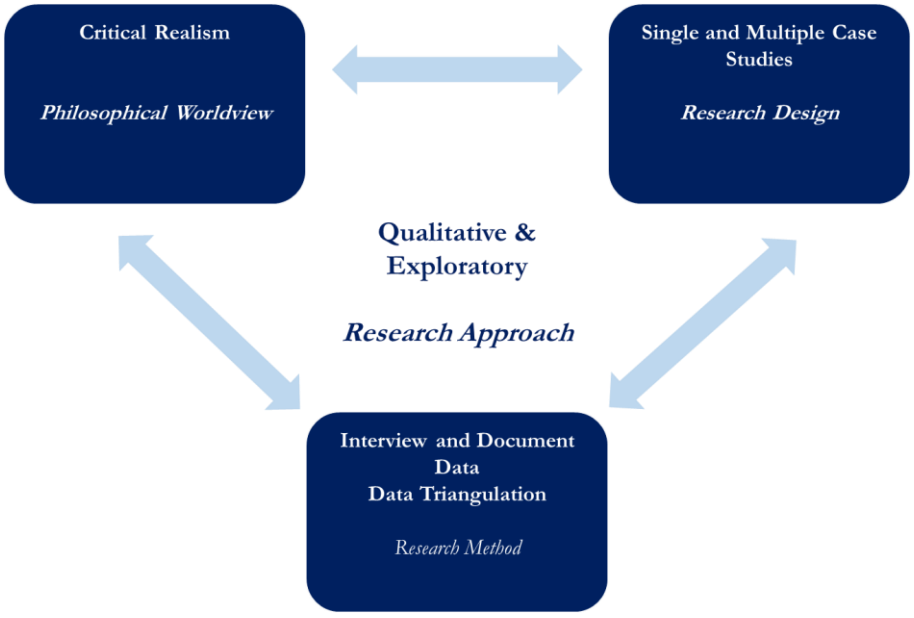
SOURCE: AUTHOR'S OWN ELABORATION

In line with a critical realist ontology, first level tendencies and "demi-regularities" were identified at the empirical level of reality (Fletcher, 2017, p.

[14] The places in parenthesis are not the principal cases of this thesis, but served as comparative cases in the respective publications.

185) through thick description and qualitative data coding. At the same time, synthetic reconstructions of the case dynamics were produced through the triangulation of the above-outlined data. Triangulation was applied to enhance the reliability and validity of the findings (confirmation), and to obtain complementary perspectives (completeness) with the hope of generating detailed observations that could "provide a platform for making retroductive inferences about the causal mechanisms that are active in a given situation" (McEvoy & Richards, 2006, p. 72). Thus, though constructing honest accounts of the different cases, each chapter generates stylised facts related to the research questions, and we were able to get a firm grasp of the overall regularities and tendencies that are teased out in the conclusion and discussion.

FIGURE 5. INTERCONNECTED RESEARCH FRAMEWORK



SOURCE: AUTHOR'S OWN ELABORATION AFTER CRESWELL AND CRESWELL (2014)

3.3 Material and project dependencies

This thesis is part of a greater research project (see Annex V: The RUNIN project) that includes 14 PhD researchers working in similar research fields. Therefore, it was of vital importance that project interdependencies among diverse stakeholders were managed adequately. In this section, we explain how these dependencies were considered by sharing insights on material dependencies and collaborative work.

3.3.1 Project dependencies

In all three case regions, around 50% of the interviews were conducted together with one other PhD researcher (approximately five interviews were conducted together with two other PhD researchers). Through thorough preparation of the interview material and the interviewees as well as ample consideration of the necessities of all participants, potential difficulties were minimised. As the joint interviews were conducted with research partners of the same project, thematic closeness of the topics was guaranteed, and joint interviews actually generated richness of the data. Accordingly, the researcher was able to obtain a better understanding of the different cases.

TABLE 6. REVIEW STATUS OF THE EMPIRICAL CHAPTERS

Ch.	**Review Status**		**PhD's Contribution**
2	Published	Editorial review	66%
4	Published	Full peer review	50%
5	Published	Editorial review	75%
6	Accepted subject to minor revisions	Editorial review	30%
7	Published	Full peer review	100%
8	Published	Full peer review	66%
9	Under review	Full peer review	50%

SOURCE: AUTHOR'S OWN ELABORATION

Different researchers from the project contributed to the various publications that are a part of this dissertation. The primary researcher can prove ownership of the publications, as she has substantially contributed to (1) the conception and design, (2) the acquisition as well as interpretation and (3) the analysis of the data of all papers that were co-authored. With respect to the joint publications, the co-authors have verified the researcher's contribution in the following chapters

as detailed in Table 6. As a result of shared authorship, some of the chapters include cases that are not part of this dissertation. The data and analysis of these additional cases were conducted by other researchers and will therefore not form part of the final chapters of this dissertation (discussion and conclusion).

3.3.2 External employment

Being an external PhD researcher employed by the Regio Twente, the researcher was aware of the dynamics and potential tensions involved in wearing "dual hats". Nevertheless, the potential restrictions often placed on external PhD researchers did not apply to the researcher in this case, who did not experience any material difference from other (university internal) PhDs. This thesis was an output for a particular organisation, but no time restrictions, parallel work or dependencies to the employer with an effect on the quality of the work were evident. From the start of the project/research, the researcher analysed what it meant to work as an academic while being employed by an external stakeholder, and the researcher was able to take a critical stance towards the research and employment circumstances. More particularly, while taking on the role as a type of boundary spanner between these two organisations, the researcher was aware of the academic responsibilities and boundaries as well as the conceptual implications, and these were discussed with supervisors on both sides (university and region). Being a PhD researcher embedded in a non-university organisation, some might want to claim that the research was driven by somebody else's (the employers) goals/interests. These potential tensions were discussed with all involved stakeholders as well as the supervision team from the beginning, and the researcher considered them along the research process, critically reflecting on potential tensions and conversing on those with the involved partners when necessary.

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4 CAUSAL AND EFFECTUAL THINKING AFFECTING REGIONAL INNOVATION PROCESSES & REGIONAL COALITIONS

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Abstract

Collaboration between regional stakeholders is increasingly emphasized in innovation policy as a way to activate the inherent agency in a regional innovation system. Partnerships of diverse stakeholders have been identified as critical, being able to envisage and implement future pathways that in turn bring change to a region. Thus, the knowledge of various stakeholders is supposed to be combined in novel ways in order to define regional assets and possible future pathways. Nevertheless, it has been recognized that these agency activation approaches often fail to realize these long-term visions initially agreed by partners. We here draw on Sotarauta's notion of policy 'black holes', where regional partners repeat past superficial successes rather than driving in to systemic change. We seek to understand the conditions under which regional stakeholders can build realistic and adaptable strategies that shift regional development trajectories. We explore this via a qualitative approach comparing entrepreneurial discovery processes in three peripheral regions, namely Twente (Netherlands), Aveiro (Portugal) and Lincolnshire (United Kingdom, UK). We reflect on the potential value of more effectual (opportunistic/ flexible) approaches to entrepreneurial discovery. We argue that black hole problems may arise from the way agency activation strategies conceptualize long-term strategy development, if partners' mind-sets

are too causal and lacking flexibility to continually reorient strategies during implementation better towards these collective visions.

4.1 Introduction and problem setting

The encouragement of collaboration between regional stakeholders is increasingly emphasized in innovation policy as a way to activate the inherent agency in a regional innovation system (Grillitisch & Sotarauta, 2018). Partnerships of diverse stakeholders have been identified in a range of different literatures as critical, being able to envisage and implement future pathways that in turn bring change to a region (Cooke, 2005). This phenomenon of stakeholder partnerships is variously referred to as regional innovation networks (Rodrigues & Teles, 2017), regional innovation coalitions (Benneworth, 2007), or multi-level partnerships (Morgan & Nauwelaers, 2003). Related to these theories are a set of corresponding policy prescriptions – such as smart specialization or constructed regional advantage – that seek to identify desirable future opportunities and reorient regional activities using policy interventions that build towards these desirable futures. But there is a problem in that 'local knowledge which is dispersed, decentralized and divided' (Foray, 2016, p. 1433). These agency activation approaches expect actors to come together in coalitions and combine their dispersed knowledge to identify and implement promising micro-level solutions, which then affect macro-level regional development paths.

This special issue is intimately concerned with how regional innovation strategies can achieve embedded change and ensure material changes that stimulate innovation-based territorial growth. We identify that one of the kinds of knowledge that may be missing in regional strategic processes is the architecture of embeddedness – existing connections between partners that can facilitate knowledge exchange and allow spill-over effects to emerge. A risk here is that regional strategies underplay the importance of these embeddedness architectures, promoting instead superficial strategic connections, with partners falling into what Sotarauta (2016) terms a metaphorical 'black hole'. In such situations, subsequent policy cycles may merely repeat earlier shallow successes, rather than embed those successes into more systemic change. A substantive

challenge in using these agency activation theories is in understanding the conditions under which regional stakeholders can, through a process of constructive dialogue, build realistic and adaptable strategies that are then implemented to shift regional development trajectories. Likewise, developing regional innovation strategies that help embed activities to create effective entrepreneurial regional innovation systems requires addressing this 'black hole' problem. We therefore argue that this issue may arise from a lack of regional capacity to build upon existing embeddedness, something that we frame as being a tendency towards causal rather than effectual reasoning by regional strategic partners (Nieth & Benneworth, 2018). The overall research question we pose is "*Are effectual approaches to regional innovation strategy a way to encourage the development of regional embeddedness?*".

We begin by examining the interplay of agency activation approaches and the issue of regional embeddedness, here conceptualized in terms of the topology of existing regional connections that facilitate knowledge spill-over, and how attempts to strategically manage new sectoral strengths can exploit these regional connections. Noting a tendency in these regional stakeholder partnerships to seek to create new industries rather than genuinely new combinations exploiting existing embeddedness (Hospers, 2006), we argue that this is potentially a consequence of a dominance of causal reasoning processes over effectual approaches in regional strategic processes. Focusing specifically on one of these agency activation approaches, namely smart specialization, we reflect on whether there are also the possibilities for more effectual (opportunistic/flexible) approaches to entrepreneurial discovery. To answer our question, we use a qualitative case study approach comparing entrepreneurial discovery processes (EDP) in three peripheral regions, namely Aveiro (Portugal), Twente (Netherlands) and Lincolnshire (UK), drawing on interviews with key stakeholders as well as analysis of process reports and policy documents. We highlight that there are three main kinds of effectual reasoning repertoire that emerge, using strategies as pathways, creating new flexible organizations and retaining institutional entrepreneurs even where they move to other jobs in a region. On this basis, we argue that there is a prima facie case for a more comprehensive inclusion of reasoning approaches within regional innovation

strategies literature, as well as to work to remove more causal thinking approaches from policy-prescriptions.

4.2 Towards a theory of effectual entrepreneurial discovery

In the last ten years there has been increasing interest in building understanding of how regions can use policy interventions to create new economic development trajectories and pathways; in this article we focus specifically on the case of smart specialization as a leading agency activation approach. A key mechanism within smart specialization is the 'entrepreneurial discovery process' in which various stakeholders come together to reveal their knowledge and identify potential new knowledge combinations; a 'local concentration and agglomeration of resources and competences in these domains' that might lead to regional competitive advantage (Foray, 2016, p. 1431). Central to entrepreneurial discovery is discovering new fields of opportunity related to existing strengths, networks and capacity, and therefore can be understood as seeking to exploit existing regional embeddedness. Successful strategic management of this process depends on successful input from regional stakeholder partnerships, which may lack the detailed knowledge of the manifold connections and social relations from which new regional advantage can be created (Yoon, Yun, Lee, & Phillips, 2015). We contend that this might potentially drive the use of causal reasoning, and in this paper, we seek to reflect the outlines of a more opportunistic/flexible approach, what we here refer to as effectual entrepreneurial discovery. We therefore propose a framework for distinguishing causal entrepreneurial discovery process behaviours from more effectual as the basis to understand whether effectual behaviours associate more strongly with more successful agency activation strategies.

4.2.1 Evolutionary approaches to regional economic development and the risk of the black hole

Following the evolutionary regional development approach, we regard places as evolving over the long-term along particular trajectories. In this perspective, the fortunes of their dominant industries drive either investment and growth, or disinvestment and shrinkages. Evolutionary economic geography distinguishes

four kinds of regional capacity (Isaksen & Jakobsen, 2017):

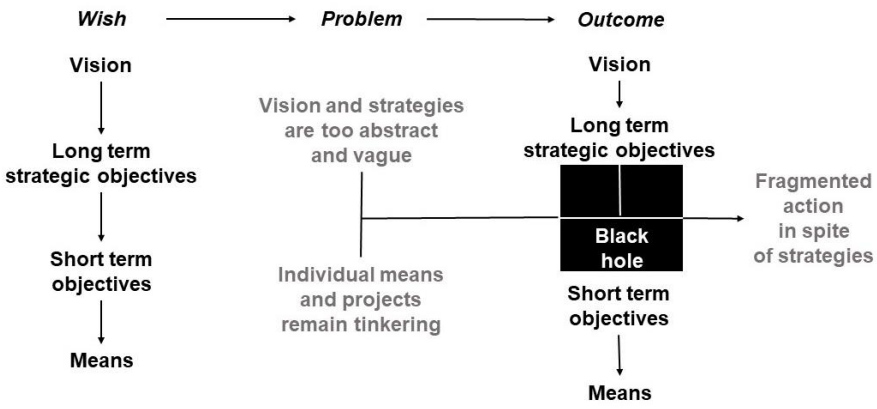
- path extension (small changes over time within the same industries/technological paths);
- path upgrading (major changes within an existing path, triggered through the use of new technologies or new modes of organization);
- path renewal (new paths as results of the recombination of existing activities and related/unrelated knowledge);
- new path creation (new industries/technological paths for a region can rely on 'imported knowledge' or the results of R&D activities.

These repertoires are sequentially more complex, with path renewal and path creation depending on regional actors able to envision and implement collective change through a process of mutual negotiation, compromise and coordination. In a recent study on path creation in Denmark, it was concluded that the renewal of paths is a result of joint contributions through 'social action by knowledgeable pioneering individuals, universities, companies and/or governments' (Simmie, 2012, p. 769).

Policy-makers seek to influence those developmental trajectories in various kinds of ways, particularly those regions undergoing or at risk of becoming locked into disinvestment-shrinkage, what we here refer to as sparse regional innovation environments (after Johannisson, 1993). Policy-makers seek to upgrade their regional trajectories through concerted programmes of investment in regional innovation, underpinned by regional innovation strategies. These strategies seek to strengthen interaction within the regional innovation systems, directing the inflow of ideas and investments, and the outflow of knowledge and productions, both building on existing regional embeddedness but also supporting an extension and upgrading of that embeddedness. The smart specialization policy model contends that regional strategies should be driven by mobilizing regional agents (for path renewal and creation) working together around entrepreneurial discovery processes. These entrepreneurial discovery processes seek to best contribute constructively to regional embeddedness, both drawing on and making use of existing embedded networks but also ensuring that activities drive towards embeddedness.

But whilst appealing in a limited number of best practice examples, in reality, smart specialization and entrepreneurial discovery do not always work smoothly in practice. Although partners may easily agree on the overall final destination (the regional innovation strategy) and a first round of interventions, as the strategy develops, they may resort to repeating those approaches initially adopted in the first strategy round. This is problematic because innovation policy is a learning process, in regions with less tradition of innovation policy, a first round of a strategy may involve simple activities that intend to build capacity between partners, for example by giving every partner some projects in which they learn how to participate in collective activities. The rational step then in subsequent rounds is to exploit these connections to leverage the deeper networks within which the various actors are embedded (for further examples see Sotarauta, 2018). However, if there is no strategic collective knowledge of the networks within which partners are embedded, then this can undermine agreeing on collective developments, diluting investments, with the result that the region does not move forward, but stagnates or backslides (see Figure 6).

FIGURE 6. SIMPLIFIED ILLUSTRATION OF THE BLACK-HOLE OF CLASSICAL STRATEGY DEVELOPMENT



SOURCE: SOTARAUTA (2004)

4.2.2 Distinguishing causal and effectual approaches to entrepreneurial behaviour

Our diagnosis here is that there is a systematic mismatch between plausible end goals (creating a new regional trajectory) and the immediate choice of strategic options that emerge through the entrepreneurial discovery process. In particular, there is an issue that the long-term vision fails to take into account the existing networks and structures, and therefore in developing strategies, projects and route-maps neglects existing embeddedness and collective assets in favour of more generally appealing interventions. We can here see that this entrepreneurial discovery process seems to be echoing a more general issue in entrepreneurship, of entrepreneurs trying to create new businesses in the split between causal and effectual mind-sets in the new venture creation process (Sarasvathy, 2001).

Sarasvathy argued that a common mistake of starting entrepreneurs was that they identified the desirable endpoint and then set out strategies to get to those endpoints. An example here is that technology businesses typically are regarded as requiring venture capital to grow, and therefore starting entrepreneurs are often seen to develop a business plan to acquire venture capital, what Sarasvathy terms causal reasoning. By contrast, more experienced entrepreneurs would realize that they needed to acquire resources to grow the balance sheet and would look around for the most readily available resources given their own personal situations and contacts, an effectual reasoning approach. Causal entrepreneurs typically have great problems and inflexibility in adjusting to circumstance when reality does not follow their causal trajectory to the desired end-state. Conversely effectual entrepreneurs have the flexibility to respond opportunistically by continually reviewing the opportunities and resources they command and then developing iterative strategies that will bring them closer to the desirable end-state.

Her current analytic framework distinguishes causal and effectual approaches in terms of five overarching attitudinal differences which manifest themselves in six categories (see Table 7cand Table 8 below). Causal entrepreneurs pick their desired future and seek to realize that, whilst effectual entrepreneurs try to move towards more desirable future end points and away from less desirable future

situations. There are a number of different kinds of belief that characterize causal entrepreneurial reasoning (i) the future can be predicted, (ii) goals can be selected and then delivered, (iii) risks are best managed in terms of their expected returns (iv) uncertainties and difficulties should be avoided and (v) success requires being competitive with reference to other partners. Conversely, effectual entrepreneurial reasoning believes (i) the future is at least partly creatable, (ii) the achievability of goals primarily relates to personal resources, (iii) risks are best managed in terms of the expected affordable losses, (iv) uncertainties and difficulties are regarded as inevitable and (v) success requires alliances as well as competition with other companies. The distinctions between causal and effectual reasoning are summarized in the following table:

TABLE 7. KEY DISTINCTIONS BETWEEN CAUSAL AND EFFECTUAL REASONING IN ENTREPRENEURIAL PROCESSES

Issue	**Causation**	**Effectuation**
View of the future: prediction vs control	The future can be predicted based on past experiences; knowledge obtained in the past serves to predict the future. It is necessary and useful to accurately predict the future.	There is no need to predict the future; focus on the extent to which you can control the means available to you. Wilful agents pre-commit to the new venture so that markets can be co-created.
Givens: goals vs means	Goals are given. Growth based orientation with a vision of desired ends. Goals determine who to bring on board. Sub-goals come from main goals.	Means are given: who I am (traits, abilities), what I know (personal experience, training, education) whom I know (personal network; family, business school professors).
View of risk and resources: expected returns vs affordable loss	Expected returns: pursue new opportunities based on risk-adjusted expected value. Financials such as loans and investments needed to reach the upside potential.	Affordable loss: invest what you are willing and able to lose. Small bets to invest in adequate opportunities with a focus on limiting downside potential.
Attitude towards unexpected events: avoid contingencies vs embrace contingencies.	Avoid contingencies: take aversive action to avoid obstacles and plan to reduce risk to a minimum.	Embrace contingencies: do not avoid risks, leverage them into new opportunities. Surprise is good for discovering new directions.

Outsiders: competitive behaviour vs partnerships	Competitive behaviour: limit ownership of outsiders. Competitive analysis needed to protect and maximise share of the opportunity.	Partnerships: self-selected stakeholders shape the direction of the new venture. Both parties acknowledge and share rewards and risks.

SOURCE: AUTHOR'S OWN ELABORATION AFTER DEW, READ, SARASVATHY, AND WILTBANK (2009); READ, DEW, SARASVATHY, SONG, AND WILTBANK (2009); SARASVATHY (2008); SARASVATHY AND DEW (2005)

4.2.3 Transposing the causal/effectual model to entrepreneurial discovery processes

We here see that these black holes could potentially emerge in regions when initial strategic discussions produce new opportunities that may not perfectly align with the desired ends, but at the same time are well embedded into regional networks. Viewed through a causal reasoning lens, these assets may have little value because they do not align well with the desired end goal, even if they may represent a perfectly acceptable stepping-stone towards one desirable future (i.e. they are visible through an effectual lens). This provides a prima facie explanation for Sotarauta's 'black hole' problematic, namely that if entrepreneurial discovery processes in regions adopt a causal entrepreneurial reasoning approach rather than an effectual entrepreneurial reasoning approach, they may overlook capacities and incremental gains embedded within existing innovation collective assets in the pursuit of a distant desirable future.

We regard the reason for this situation in that the regional innovation strategy approach in Europe has emerged to emphasize logic, structure and reason, providing a controlled approach for regions to follow to avoid copying supposedly best practice regions (Boekholt, Arnold, & Tsipouri, 1998). Indeed Boekholt *et al.*'s model of what was then called the Regional Technology Plan approach has been seamlessly transposed into regional innovation strategy approaches in which causal reasoning is central (IRE, 2007; Socintec, 2004). The approach involves systematically developing strategies that collectively agree desirable directions of travel and regional futures. To deliver that desirable regional future, regional partners follow a strictly prescribed process mapping assets, identifying potential linkages and gaps and, finally, proposing policy interventions to fill those gaps. On the basis of Table 7 above, we distinguish the

ways that this structured reasoning could differ in the outcomes depending upon the association with causal and effectual entrepreneurial reasoning. Drawing Foray (2015)'s characterization for entrepreneurial discovery processes, we produce two stylized models of entrepreneurial discovery processes, summarized in Table 8 below:

TABLE 8. STYLIZED DISTINCTIONS BETWEEN CAUSAL AND EFFECTUAL REASONING IN EDPS

Issue	**Causation reasoning in entrepreneurial discovery**	**Effectuation reasoning in entrepreneurial discovery**
View of the future region: prediction vs control	The future region can be predicted based on past experiences and with input from external consultants regarding future trends that allow an accurate future picture to emerge.	Future trends may create opportunities that might benefit or penalise the region; it is important to harness the region to trends that will lead to growth-investment scenarios, and policy can co-create these futures.
Givens: goals vs means	The purpose of a regional strategy is articulated in its goals and visions, setting concrete and measurable targets with means being chosen to deliver those desirable targets (e.g. high-technology job creation).	The purpose of a regional strategy is to articulate assets and capabilities, and in particular the capabilities within networks to create potentially competitive new combinations.
View of risk and resources: expected returns vs affordable loss	Selection of projects and instruments based on return to public investment and leverage against the desired headline targets.	Selection of projects and investments on the basis of what is most necessary to support the regional entrepreneurial ecosystem and to stop negative domino and shadow effects from failures.
Attitude towards unexpected events: avoid contingencies vs embrace contingencies.	Avoid contingencies: take aversive action to avoid obstacles and plan/ select activities to reduce risk to a minimum.	Embrace contingencies: do not avoid risks, leverage them into new opportunities. Surprise is good for discovering new directions.
Outsiders: competitive behaviour vs partnerships	Focus on supporting individual actors to maximise their private gains from innovation activities	Focus on building partnerships and shared collective assets that help to stimulate regional knowledge spillovers that densify the regional innovation ecosystem.

SOURCE: AUTHOR'S OWN ELABORATION

The framework above provides means to address the question of whether there is an association between causal entrepreneurial discovery processes and a failure

to develop strategies that embed collective innovation assets through strategic investment programmes. We would hypothesize in this case that these failures to develop embeddedness would be associated with particular kinds of strategic behaviour in regional innovation strategy processes, namely: attempting to predict a desirable future; operationalizing a pathway to that future with clear targets; selecting processes that deliver against those targets; avoiding risky activities that do not necessarily immediately deliver against those targets; and channelling public investment resources to individual companies to generate those targets. In this paper, we therefore ask the operational research question of "*What are the factors that encourage entrepreneurial discovery processes in less munificent regional environments towards causal rather than effectual forms of entrepreneurial activation?*".

4.3 Methodology and introduction to the case-studies

To answer that question, we adopt an exploratory-hermeneutic approach in which we examine a limited number of entrepreneurial discovery processes associated with regional smart specialization. We have proposed a conceptual distinction between two kinds of entrepreneurial discovery process, and we are thus seeking to understand whether those features are found in reality and what are the underlying dynamics of those situations. We apply a case study approach in which we seek to generate a deep understanding of the chosen situations to be able to effectively characterize the nature of those entrepreneurial discovery processes and relate them back to the ability to progress in smart specialization.

The three case study regions are wrestling with issues of path-creation due to the decline of their traditional industries (textiles and agricultural products). In these regions, regional policy actors have sought to bring together new networks of innovative companies and their universities in an attempt to generate new sources of regional competitive advantage. The case study in each region was based on a similar approach, seeking to understand the policy and strategy processes by focusing on the minutiae of the development of regional innovation strategies. In each region there was a mix of primary stakeholder interviews and secondary documentary analysis within the framework of a larger comparative research project. In this paper we have selected the material relating to their

entrepreneurial discovery processes, to stylize those regional processes through a thick description approach. On that basis, we produce a schematic reading of effectual and causal entrepreneurial discovery processes, which in turn provides us with the material to answer our research question.

Aveiro

Located in the Centro region of Portugal, Aveiro is comprised of 11 municipalities of roughly 370,000 inhabitants. Its economy is primarily industrial in the sectors of food, metallurgical, chemical, non-metallic minerals, automobile, electric and IT sectors, with significant exports and a strong SME base (Rodrigues & Teles, 2017). The lead administrative body in Aveiro is the intermunicipal community CIRA, formed following Law 11/2003 which allowed legal personality for municipal associations. CIRA has a non-elected leadership and is associative in character, with its member municipalities granting it certain competencies in regional development to deliver common interests. The University of Aveiro (UA), as a key innovation actor, has encouraged CIRA to build relationships between local and regional actors, such as local governments, higher education and research institutions, firms and industrial agencies. CIRA has promoted a set of key strategic projects around sustainability, innovation, competitiveness and overall development of Aveiro, articulated through CIRA's Territorial Development strategies (2008–2013 and 2014–2020). The first of these was inspired by the Triple Helix model (Rodrigues & Melo, 2013; Rodrigues & Teles, 2017) whilst the latter applied the principles of the smart specialization framework to ensure compliance with European Structural Funds requirements (Rosa Pires, Pinho, & Cunha, 2012).

Twente

The Twente region, located in the Eastern Netherlands, emerged as a centre of textile and engineering industries, which steadily declined in the post-war period. The region is formally constituted by 14 municipalities – five primarily urban and nine rural – within the Province of Overijssel and shares a border with Germany. Since the early 1990s Twente has developed technology systems and materials industry as an extension of its engineering industries, with some sectors around mechatronics developing high-technology innovative clusters. Yet, Twente

persistently lags behind the Dutch average in terms of unemployment and economic growth. The Twente region had formal legal competencies in regional economic development until 2014, when a new national law handed those competencies to the higher provincial level, and in Twente what remained was a purely voluntary group seeking to exert informal leadership. This involved an inter-municipal regional organization, the province and a regional economic development board involving business, government, education and public services. In 2007, regional actors developed a collective regional innovation strategy entitled the 'Agenda of Twente' with 'high-tech' as an all-embracing theme, aiming to make Twente a top-five European knowledge region. Since 2014, regional partners have developed a new strategy, the 'Agenda for Twente', as an investment process with similar but not identical aims for the Agenda of Twente.

Lincolnshire

Lincolnshire is a rural region with significant economic, social and environmental diversity (HEFCE, 2001) dominated by very small-scale, less innovative businesses with North and North East Lincolnshire having a more industrial heritage; Lincolnshire has 41,000 SMEs as well as Siemens' largest UK manufacturing plant (linked to the University of Lincoln, UoL). The region is primarily agricultural, producing 25% of the UK's vegetables, and its most dynamic sectors are manufacturing, engineering and agri-food, something reflected in the regional development strategy as well as UoL's strategic plan. Until 2010, Lincolnshire was part of the East Midlands region, and economic development was the responsibility of the East Midlands Development Agency (emda), abolished in 2012 and replaced by a local enterprise partnership (LEP) with substantially reduced resources. Lincolnshire LEP was smaller than emda both in terms of its budget and its responsibilities and operated on a voluntary bottom-up basis as a partnership of local authorities and business partners (with rather less representation for the universities than they enjoyed within the RDAs). In Lincolnshire there is the peculiar situation that parts of the region are in two LEPs, with the Greater Lincolnshire LEP (GLLEP) formed by Lincolnshire County Council along with North Lincolnshire and North East

Lincolnshire councils, whilst these latter two authorities are also part of the Humber LEP.

4.4 Entrepreneurial discovery processes in the three regions

Each of the three regions – Aveiro, Twente and Lincoln – has developed a regional innovation strategy in recent years. Partners in all three regions were motivated by a desire to access European regional funds, although none of the regional authorities developed a RIS3 strategy to meet the ex-ante conditionality requirement to access structural funds, being covered by smart specialization strategies at a higher administrative level. In all three regions, there was a genuine desire by regional partners to stimulate a change of regional direction, to create new kinds of innovative business activities that might contribute to improving the innovativeness of regional industry and the wealth of the region more generally. In this section, we present a brief overview of the smart specialization process in each region with particular focus on the entrepreneurial discovery process. In section 5 we then turn to consider whether these represented causal or effectual approaches to entrepreneurial discovery.

4.4.1 Aveiro

The 2014–2020 regional strategy of the region of Aveiro built upon the collaborative momentum that came from earlier initiatives. More precisely, the THM-inspired strategy from the previous period of 2008–2013 is considered the first attempt to develop interaction between regional innovation stakeholders, creating the Urban Network for Competitiveness and Innovation. This network brought together CIRA, UA and two major entrepreneurial associations who, for 12 months, participated in active collective dialogue on local innovation challenges and opportunities (Rodrigues & Melo, 2013).

In the more recent period, structural funds shaped the mode of stakeholder cooperation (Rodrigues & Teles, 2017). In the design of the strategy, an entrepreneurial discovery process was attempted with the engagement of a mixed range of regional stakeholders for the discussion, identification and definition of priorities for the development of the region (CIRA, 2014). Besides all the local

governmental authorities represented in CIRA, this entrepreneurial discovery process also involved a joint protocol with UA and an Industry Association. It thus represented the Triple Helix approach with government, higher education institutions and industry all involved in formulating a common strategy for shared goals, underpinned by a joint protocol applied by all partners (CIRA, 2014).

The strategy was explicitly oriented towards accessing European Cohesion funding, therefore adopting European regional innovation policy principles, emphasizing the strengthening of the regional innovation system, and with programmes and actions for the promotion of development, growth, social inclusion and employment. The areas of smart specialization identified consist of: 'Sea and Aveiro Lagoon', 'Information and Communication Technologies', 'Materials' and 'Agri-Food and Forest' (CIRA, 2014).

However, while the collaborative nature of this strategy emerged from a certain relative pre-existing context of partnerships and joint initiatives across multiple sectors, the summary of participation in the entrepreneurial discovery process to three major actors indicates the lack of a comprehensive engagement and articulation of stakeholders. CIRA's Council of Mayors and UA were namely the ones that identified and proposed the specialization areas. The entrepreneurial discovery process took place over a two-year period (2012–2014) with discussions dominated by CIRA and UA, a situation also formalized in a protocol that defined the joint ownership of the initiative. The Council of Mayors nominated a team of members and researchers to design the strategy, and the process was approached in three main stages (CIRA, 2014; Rodrigues & Teles, 2017). The first stage involved an analysis of the regional entrepreneurial ecosystem within its wider international context, alongside a survey of regional stakeholders from academia, business, the public sector and civil society. The second phase was a multi-level tuning process, particularly with Centro's RIS3 strategy, Portugal 2020 and the EU Cohesion framework 2014–2020, incorporating assessments of previous regional instruments; priorities and innovation potential was included in this phase, with various regional stakeholders participating in this activity, led by representatives drawn from

participating municipalities. The third phase involved developing the action plan and monitoring mechanisms for the projects to permit cross-sectoral and multi-level investments.

Although this procedure benefitted from previously established routines of interaction and cooperation, the greatest tension in this process was in broadening the network of engaged regional stakeholders (Rodrigues & Teles, 2017). Following previous initiatives in Aveiro, the territorial development strategy and the programmes that followed had become extremely reliant upon the 'governance architecture' established by two main agents, CIRA and UA, who were able to mediate through decision-making deadlocks. While both witnessed an expansion of their institutional role and the scope of their missions, overall modes of participation in the policy process suffered no significant change and call for the engagement of stakeholders remained mostly top-down, not expanding to a more inclusive and bottom-up process. The shift in the policy process needed an enhanced governance arrangement with additional structural capacity, but evolution was restricted to transitioning towards a more complex co-production system (Rodrigues & Teles, 2017).

4.4.2 Twente

In the case of the Twente region, at the end of the first strategic cycle, regional actors believed that any new agenda should be more strategic and regionally relevant, involving more significant stakeholders and avoiding the dilution of priorities that had allowed the expenditure of €1M on a swimming pool under the heading of regional branding. The process was handed in the first instance to a newly constituted Twente Board, a collaborative body formed between 2012 and 2014 with 10 representatives from industry, government and higher education institutions. Although the Twente Board had not been involved in the previous strategy, their mandate was very similar, namely, to propose regional strategy that enhanced regional economic development and internationalization, focused upon technology, entrepreneurship and the labour market. The Twente region has long been criticised for its plethora of boards, platforms and valleys that perform largely identical functions, and it was hoped to bypass this institutional tangle by giving the Twente Board overall responsibility, rather than

being driven by the regional body under oversight of the municipalities, which had characterized the first strategy.

The process of developing the new strategic agenda for the region started in earnest in 2015, when the Twente Board was first asked for advice on the potential contours of a new strategy, with concrete input for a new agenda collected from January 2017. This first exploratory phase included feedback and constructive contributions from diverse regional actors, with the first draft including input from stakeholders like municipalities, business representatives, educational institutions and civil society. This framework document identified a number of key issues for Twente, including the low skills level, declining rural quality of life, a lack of attention for agriculture and recreation, accessibility, talent retention, regional profile/ branding and strengthening regional co-operation. On this basis, a set of objectives and four action lines were proposed for the next 5 years (2018–2022), building on this exploratory phase, and there were serious attempts in creating the second regional strategy to address some of the issues that had emerged in the first strategy round (see Table 9).

TABLE 9. EXAMPLES OF WEAKNESSES OF AVT1 AND PROPOSED SOLUTIONS FOR AVT2

Problem in AvT1	**Proposed solution for AvT2**
Not all the financed activities were actually beneficial for the region as a whole (e.g. swimming pool, soccer fields)	• Clear focus on projects/activities in line with the strategic infrastructure of the region; • Proposed activities have to be in line with the 4 overall action lines and undergo a process of revision of the one of the 4 'action line tables', a financial committee and the Twente Board.
The HTSM sector is a very specific sector, that not everybody, and especially not every project, can identify with	• The new focus/spearhead is "technology" as a whole and not HTSM as a specific top sector; • Technology it is supposed to be an enabler for other things to happen, it is described to be in 'Twente's genes' and can make the region competitive on the long-term.
Very scattered or missing governance and monitoring	• The Twente Board will act as a steering and decision-making body that oversees project choice, implementation agendas, etc.; • There will be public tables for each action line which discuss topics and activities within their line and have the power to evaluate and recommend projects; • Interviewee: "you want to have an interrelation between those different initiatives so they make each other

	stronger and you get more impact... going from short-term to long-term... not everyone doing something..."

SOURCE: AUTHOR'S OWN ELABORATION

There were various critical moments and problems in the process of developing the new agenda that showcase the difficulties the diverse stakeholders have encountered. One key problem that emerged was that attempts to sharpen the focus of the strategy raised resistance from participating municipalities. The Twente region has long been characterized by a fear of the outlying municipalities of a domination through the urban municipalities, and particularly the primate city of Enschede. The second strategy proposed to target investments more on the urban areas and more on high-technology areas, and by implication less on the rural areas. At the time of writing, two municipalities had announced they would not participate in the Agenda for Twente, the smallest of the three cities (Almelo) and the western rural municipality of Hellendoorn.

4.4.3 Lincolnshire

In the case of Lincolnshire, the strategic process from 2012 developed a LEP strategy for the first time, with little direct inheritance from emda's processes. For the purposes of this case, Greater Lincolnshire LEP's Strategic Economic Plan is the key strategy seeking to influence regional innovation and economic growth. The LEP emerged in a relative hurry because of national political pressure to abolish the regional development agencies, and in the absence of existing strong real networks, developing the strategic plan was a hasty process. The strategy was produced as a result of engagement with 'hundreds of businesses, local authorities and trade bodies'. However, in this emergent process, the University of Lincoln (UoL) assumed a highly important role. The university's own background endowed it with close links to the County Council. As the University of Humberside it had opened a campus in Lincoln in 1996 with strong County Council support, which had later become the university's main campus (with its Hull campus closing down entirely). UoL had been a strong advocate for the County Council in bidding for LEP status, and UoL employees were involved in many of the working groups developing the Strategic Economic Plan (SEP), sometimes on partial secondments (Regeneris Consulting, 2017). At

the time of writing UoL chaired GLLEPs Innovation council, a subgroup of experienced innovators providing input into the regional innovation elements of the SEP.

UoL emerged as a key player in this SEP and ensured that the regional key priorities were strongly linked back to the university's core areas. The SEP identified three main sectors as priorities – agri-food, manufacturing and engineering and the visitor economy. These were simply identified as the major sources of value added in the region – agri-food is well above the UK average, manufacturing and engineering is a little above average, and the visitor economy whilst near the UK average in size is particularly important to the coastal towns. Additionally, three emerging sectors were identified based on the existence of specific projects or local assets – low carbon, ports & logistics and health & care – areas where there was potential in regional industry as well as research base. Whilst these latter three sectors in particular potentially fit with the principle of smart specialization, they were apparently identified by the LEP board through a top-down process rather than a bottom-up entrepreneurial discovery process, led by local businesses in the sectors. None of these sectors are particularly research-driven, although the university is active in several, supporting local industry through skills and knowledge transfer. UoL has strong links to Siemens in its Lincoln campus, as well as to agri-food through the National Centre for Food Manufacturing located at the Holbeach Campus, with the university undertaking much activity in business services and incubator structures.

The GLLEP developed a strategy for delivering the European Structural and Investment Funds whose innovation focus drew on 'university-led research supporting key sectors; effective knowledge transfer and good quality education and skills development' (GLLEP, 2016, p. 49), as well as greater use of broadband technology. GGLEP claimed that the innovation strategy had been developed in accordance with European smart specialization guidance 'driven by analysis of our knowledge/research and development assets, sectoral strengths and competitive advantage' (2016, p. 53). Despite these claims, there was a sense that the strategy emerged as a very traditional horizontal regional innovation strategy, drawing on the university as the main source of local expertise, in an

area lacking other research facilities. Indeed, the innovation programme was subcontracted to the university to deliver and focused primarily upon supporting all eligible SMEs with research and development projects, innovation vouchers and advice, rather than targeting in line with smart specialization.

There were two main issues with a more developmental approach to smart specialization in Lincolnshire. The first was the absence of long-term academic networks with a strong regional focus; the relative sparseness of the academic environment made it hard for researchers to maintain an academic profile whilst working with regional businesses, and researchers often moved outside the region, taking their contact networks with them. The second was the fragmentation in the business sector, with many very small businesses requiring extensive bespoke support to self-consciously decide to become innovative companies, whilst at the same time also being invisible to regional strategy makers.

4.5 Effectual and causal entrepreneurial discovery repertoires

4.5.1 Aveiro

In the case of Aveiro, it is possible to identify a very strong causal logic running through the development of the more recent regional innovation strategy, derived from its top-down nature between CIRA and the University. Although there were efforts made to involve a wider selection of participants than in the previous triple helix strategy, its bureaucratic logic identified a desire to create certainty around a set of potential future sectors, as well as creating an administrative structure to deliver that certainty. The four sectors chosen in the strategy became an end in themselves rather than necessarily a means of mobilizing actors to propose and develop innovative projects that might create regional spill-over effects. The desire to retain control over the process within the core entrepreneurial discovery team (CIRA and UA) reduced its flexibility to operate and created a rigidity in the process that did not allow it to meaningfully build upon what it inherited from the previous regional innovation strategy. It therefore appears to be associated with this regional innovation stasis.

At the same time, it is possible to identify elements of more effectual reasoning

in the entrepreneurial discovery process of Aveiro. Interviewees confirmed that the first strategy formulation process enhanced the overall capacities of diverse partners. While both learned how to work together, they also learned about each other's operational capacity below the strategy level. One example of this was the emergence of a regional specialization area that genuinely reflected regional uniqueness. The lagoon area is a dominant physical feature of Aveiro and it is therefore unsurprising that a wide range of different partners had developed different kinds of knowledge and products related to its development. There were also a number of activities proposed for support that sought to bring different networks together, for example around maritime engineering and ICT, to create new telemetry devices for the ocean. In linking between these two communities with their very different orientations but the shared regional embedding, the regional strategy was able to promote something that had the potential to be useful in terms of building up regional critical mass for innovation.

4.5.2 Twente

In Twente, the regional stakeholder partnership inherited a causal mind-set from the initial regional innovation activity, in which Twente Index had been created to facilitate the measurement of the progress towards the desirable future. In the context of a fragmented group of regional stakeholders, this measurability had persuaded regional partners of the need for coordinated action, but at the same time had strengthened a belief that all the valuable contributions were measurable. All activities oriented towards capacity building, particularly the capacity within innovative networks, were therefore only visible if they also included measures in the short-run to stimulate economic activity. Likewise, causal reasoning had been implemented in a far-reaching way in the selection process for new projects and activities, which involved a 3-step procedure through decision-makers at working tables, a financial board and finally the Twente Board itself, evaluating return on investment and strategic alignment. This selection process (what at the time of writing was not complete) was planned to drive activities towards that most obviously fit with long-term goals and away from those that focused on more plausible capacity creation. By trying to plan around possible obstacles and minimize risk, surprise factors and innovative,

unexpected developments were eliminated from consideration, encouraging a continuation of initial activities rather than seeking to exploit embedded capacity.

There were also clearly effectual processes present, because regional partners were smart enough to appreciate that the strictly causal logic was missing something. On some occasions, the three-step procedure deviated from what was intended to move away from selection towards construction, where changes to projects were proposed, or new ideas proposed, to exploit existing capacities and create novel combinations. One area where this was particularly important was around the significance of technological projects for Twente's rural hinterland; the initial emphasis on being a leading technological region was quickly realized as being irrelevant for these rural regions, and therefore efforts were made to articulate a wider range of regional strengths. A final effectual element can be seen in the plethora of boards and structures that typified Twente emerging out of a reluctance to omit any potential from strategic processes and to build in substantive redundancy to strategy processes. Calls to 'simplify the structure' can therefore be regarded as being underpinned by a causal element that overlooks the coupling between substantive networks that was regarded as important to stimulate economic development in a region with a strong understanding of its own shortcomings.

4.5.3 Lincolnshire

In Lincolnshire, a number of different causal lines of reasoning can be seen in the processes towards the creation of the GGLEP and its regional strategy. Firstly, the partnership was created in great haste and underpinned by a political need to create anything to replace the abolished regional development agency. In this process, what was necessary was to have a long-term vision and a first short-term plan to achieve it, in the context of partners with no underlying knowledge of the capacities embedded into regional networks. Instead of finding partners and creating networks around regional assets, the logic that prevailed in this interest was the need to fulfil functionalities that created the basis for cooperation. Additionally, the clear role of the UoL in identifying core areas of the regional strategy, in line with its own preferences, hints toward causal logics, that support individual actors more than creating partnerships to stimulate

knowledge sharing and spill-overs. More generally, the definition of emerging sectors within Lincolnshire was described by a number of interviewees as a primarily top-down process, with little capacity to embrace contingencies or leverage new opportunities.

At the same time, some aspects of effectual thinking can be identified, particular as far the processual arrangement of strategy making was concerned. A key element of this was the way in which the UoL seconded a number of staff to work at the county council. These secondees were working to identify common ground between partners and to build a wider, shared understanding in a way they believed could not be delivered through orchestrated periodic meetings when attendees were representing their host institutions. Although the level of common purpose appeared not to be as great as that in Novel-T in Twente, this bilateral secondment created a sheltered space where a common interest could be built up as the basis for coordinated actions towards more representative regional outcomes. It is important not to exaggerate how extensive these effectual logics were (particularly given the speed with which regional partners found themselves having to develop the strategy). Nevertheless, even where top-down processes were used to identify priority sectors (a causal form of reasoning), there was a sense amongst partners that this was a temporary situation for the purpose of capacity-building and developing a better understanding of regional innovation access.

4.6 Reasoning approaches in entrepreneurial discovery processes

We now relate this to our overall conceptual framework, which has sought to distinguish the dynamics of causal and effectual reasoning evidence in entrepreneurial discovery processes creating regional innovation strategies.

4.6.1 Causal reasoning in entrepreneurial discovery processes

On the basis of our three case studies, we identify three causal reasoning repertoires recurring in these different cases, namely that strategic choices 'freezing' at the moment of publication, the complex project selection reflects

those moments of 'freezing', and a tendency to select partners based on their parent organizations rather than their capacity to mobilize capacity for regional collective action. These three factors together tended to have the common effect that continually undermined progress and led to situations of strategies repeating themselves rather than adding up over time to represent a coherent programme of interventions that would contribute to knowledge-based regional development.

Firstly, it was clear that the defined strategies froze at the moment in time to which they were reacting, and before this point there was some flexibility to choose between different potential directions. However, once the direction of travel was chosen, that direction became internalized as a necessary condition rather than one possible desirable future. This in turn engendered an extremely low flexibility to react to future events; in effect, they had made it impossible for themselves to succeed because there was never a chance that exactly those futures would be delivered, but any deviation from that path was seen as being somehow undesirable.

This relates to the second element of causal reasoning within the process, which was the selection of projects to receive funding, and the way in which the derivation of selection criteria from the strategies reduced the flexibility to consolidate and build up projects in interesting and productive directions that were not specified ex ante. This had the effect of leading to all the chosen projects being constructed in an artificial way to be able to prove that they met the requirements of several years earlier, not what was then necessary, and certainly not reflecting the capacities that had been created in these projects that did not immediately and directly relate to what had previously been specified in the 'frozen' strategies. This clearly made it hard for them to build up into overall regional transformation.

The third area of causal reasoning was in the assembly of the individuals to be involved in strategic activities. In all three regions, partners were selected to participate in strategic activities because they held a representative position in one of the participating organizations rather than because they had the contacts, skills and resources to deliver effective projects. The issue here was that these

representatives tended often moved on, and therefore those skills, contacts and resources were lost from the strategic team. This provided a third factor which in turn made it hard to build up and develop activities within a region – although there were examples of where individuals had moved between different roles within these partnerships and this had contributed to some progress and away from falling into black holes.

4.6.2 Effectual reasoning in entrepreneurial discovery processes

We have been able to recognize three repertoires of effectual reasoning present in the different cases, where strategies represented pathways, where attempts were made to create flexible organizations that could react to events, and changing participants based on their responses and not their representative function. Firstly, there was an evolution in all three regions away from setting a goal that was ambitious towards setting a goal to adopt a new way of working, thereby avoiding the risk of trying to achieve an unattainable goal. The best example of this was in Twente which abandoned the strategic desire to be a top high-tech region, and instead argued that it wanted to be a region in which technology played a fundamental role, thereby shifting the focus away from GDP levels towards the adoption of new kinds of techniques and practices by regional industry.

Secondly, there were examples of regions adopting techniques and organizational forms to avoid a kind of fossilization highlighted in the causal reasoning. This was most evident again in the case of Twente when there was a parallel discussion structure that reflected on how the region was developing and what was necessary, and those discussions were fed back to create new projects. Even if that approach did not address the issue of static end goals, the ongoing reflection process brought a degree of updating to the ways partners understood those end goals.

Finally, in all three of the partnerships there was an evolution in participants that was at least partly driven by a desire to refresh partnerships with partners who had resources and assets that could potentially contribute to realizing useful projects. In the case of Twente, further education became involved as it was

obvious that the college could contribute and benefit from some of the projects in association with the university of applied sciences around materials innovation and entrepreneurship. The best example of this was seen in Aveiro with the emergence of the Smart Coast Initiative; where a few regional partners realized the importance of connecting different sectors around the maritime topic, until it has become an important part of the strategic direction of the region.

4.7 Embedding effectual entrepreneurial activation in smart specialization processes

In this paper, we have asked the research question of whether effectual approaches to regional innovation strategy are a way to encourage the development of regional embeddedness. Our first observation is that it is indeed possible to distinguish in our empirics between causal and effectual kinds of reasoning in entrepreneurial discovery processes, and they also seem to correspond with what we expected, namely that causal reasoning would be static and restrictive, whilst effectual reasoning was associated with more iterative and progressive strategies. There are three more specific points emerging from our analysis that are salient to answer the question, namely that effectual reasoning is more selective, that particular kinds of processes appear necessary to enable effectual reasoning and that there is a key role for regional leadership (cf. Grillitisch & Sotarauta, 2018). At the same time, we acknowledge that this was a small, exploratory study seeking to understand the dynamics of reasoning in regional strategy processes, and we must remain modest here in our claims, in that they are more suggestive than definitive. Nevertheless, the issue of effectual reasoning appears to be a worthy avenue of study to help improve the embedding of regional innovation systems.

The first issue is that the causal reasoning processes produced regional strategies that were relatively easy for regional partners to support, in that they excluded almost nothing, but at the same time that meant they did not provide a useful selection guide for regional partners. The hard choices that were made were not about choosing between two equally unlikely future technology sectors but identifying what might be considered as regional styles of innovation, such as

Twente choosing to implement technology as its unique selling point or Aveiro's rediscovery of the contemporary potential of its longstanding strengths around marine and maritime technologies related to its lagoon. Although it is perhaps obvious, it is worth emphasizing that this approach, in selecting a few areas that are good enough, is at odds with the whole contemporary public policy approach of new public management (cf. Kickert, Klijn, & Koppenjan, 1997), in which potential choices are made on the basis of scoring, evaluating, comparing and dispassionately choosing. Therefore, this suggests that the effectual reasoning approach needs to be accompanied by a change to market-driven approaches to public policy-making.

Related to the first, our second point is that effectual reasoning emerged in processes that permitted effectual reasoning. In situations where these new public management repertoires dominate – evaluating and comparing competing options – there is almost no room for effectual reasoning to be used. We note that the whole entrepreneurial discovery process as constituted allows for the possibility that it will be causal (comparative) or effectual (constructive), and no guidance is given as to how to drive to one or the other. But we likewise note that the wider meta-narrative of regional innovation policy has been based on a causal logic, that regional innovation systems are knowable, that gaps can be identified and filled. The entrepreneurial discovery process appears to have been intended to change that mind-set, but by building on the existing repertoires of regional innovation policy, that embed causal thinking, they undermine the opportunity to drive genuinely constructive innovation policy processes. Delivering Cooke's transversality requires the deployment of novel repertoires that permit and facilitate this flexible and constructive thinking (Asheim, Boschma, & Cooke, 2011).

Our final conclusion relates to the role of regional leadership and these reasoning processes (Beer & Clower, 2014). Representatives in regional leadership forums appear to have to have a primary concern with their individual institution's wellbeing and therefore seek to create strategies that appear to guarantee their institution will benefit from the policy. This drives towards precisely the 'freezing' of strategies that undermine their flexibility, but at the same time that

is unavoidable because of their representative role. In all three examples we saw that the real flexibility and leadership was provided by institutional entrepreneurs below the level of the senior leaders, who were able to mobilize and extend their networks to construct promising projects that supported regional embeddedness. This study therefore backs up the argument of Benneworth, Pinheiro, and Karlsen (2017) that more consideration in regional leadership studies needs to be given to emergent leadership. Most obviously, this highlights the opportunity that emergent leadership creates for effectual reasoning to support in developing embedded regional innovation systems.

4.8 References

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5 UNIVERSITY ORGANIZATIONAL STRUCTURES AFFECTING ACADEMICS AS INSTITUTIONAL ENTREPRENEURS

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Abstract

The chapter addresses the question of how universities respond to regional policy, and in particular, the ways in which academics are motivated and encouraged by regional development policies. The chapter specifically asks whether entrepreneurial universities create frameworks which allow university actors to positively contribute to collective development activities (such as clusters or technology transfer networks) by building new kinds of regional institutions. The chapter uses examples from three universities that all seek to be actively regionally engaged. This chapter identifies the factors that both encourage but also discourage these individual actors and notes that ongoing connections between individual academics and regional partners are critical to ensuring this constructive collaboration. The chapter contends that regional innovation policy should devote more resources to building these critical links.

5.1 Introduction

It is increasingly common to assert that policy-makers are demanding that universities make themselves more relevant to society with more useful knowledge. In response to this, some have argued for a new ideal type of

university which places creating societal impact at the heart of its institutional mission (Alain & Redford, 2014; Benneworth, 2014). It is widely agreed that this new ideal type of university develops new internal governance approaches that allow them to encourage external engagement, whether in terms of the kinds of strategic projects they pursue, their support infrastructures for knowledge exchange or even how internal culture regards external engagement. Clark (1998) proposed the idea of the entrepreneurial university, as a university which managed to align these various elements in self-reinforcing ways, building engagement into the institutional DNA of the university. Although many other ideal types have been promoted for engaged universities, what all these models have in common is the notion that university engagement relies upon a set of institutional alignments, from the steering centre to the individual academics.

These are not exclusively academic notions – they have emerged in the literature in response to this policy enthusiasm amongst regional policy-makers to make universities more engaged. And in focusing on 'universities' as institutions, they fail to address one of the critical characteristics of the university, that universities are 'loosely coupled communities' (Reponen, 1999; Weick, 1976). Although universities have undoubtedly become more centralised in governance and management terms in recent years, they remain knowledge institutes. The knowledge processes of teaching and research vary widely between different disciplines and reflect different contexts, making it hard to create singular policy structures to steer them (Benneworth, Pinheiro, & Karlsen, 2017). This is also true for university engagement activities, what Laredo (2007) referred to as the 'Third Mission', where there has been a tendency for universities to focus on supporting and creating infrastructures for income generation activities such as licensing or contract research. This ignores the many other ways in which academics come into contact with societal partners, and through which their research may be useful, and has framed the idea of the entrepreneurial university as a top-down institution that steers its staff towards acts of commercial engagement.

We contend that the idea of the entrepreneurial university could be enhanced by decentring the notion of entrepreneurship away from commercial acts of

technology transfer towards the ways in which university actors create knowledge that is useful for external partners. We propose to focus on how individual academics, undertaking a range of entrepreneurial activities within their knowledge processes, shape the wider institutional environment and support structures for entrepreneurship; conceptualising these individuals as "institutional entrepreneurs" (Garud, Hardy, & Maguire, 2007). We consider the ways in which these university institutional entrepreneurs attempt to create new activities to respond to regional knowledge needs, addressing particular problems that external partners such as businesses face in accessing university knowledge. These individual acts of institutional entrepreneurship have the potential to grow and concatenate into a broader process of institutional change within universities, shaping the universities' internal institutional pillars to increase this overall orientation towards creating useful knowledge for external actors. To do that, we ask the research question "*How do entrepreneurial universities create (or do not) frameworks which enable purposive actions by academic actors to participate in regional development outcomes?*".

To answer this question, we develop a conceptual framework to explore these acts of institutional entrepreneurship where academics incorporate regional partners in their teaching, research and third mission activities. We explore this framework with case studies of three universities which have all recently been active at the institutional level in seeking to promote regional entrepreneurship activities in various ways, engaging with policy-makers in these processes. We focus on three concrete projects in these institutions, namely the Fraunhofer Project Center in Twente, the Aveiro Creative Science Park and the Aalborg Matchmaking system, to examine whether these projects drove wider institutional changes and increased the entrepreneurial orientation of their universities as a whole. We highlight that these efforts were successful but at the same time policy interventions can create tensions for institutional entrepreneurs by making it harder for them to construct these activities in ways that meet both university and regional needs. We conclude that a new approach is needed to understand how universities contribute to regional innovation-based development and recommend that policy-makers develop more nuanced instruments and tools to empower institutional entrepreneurship by individual

academics rather than focusing on high-level contracts with the university steering centre.

5.2 Background

5.2.1 Regional innovation ecosystems, system failures and filling the gaps

Today, universities are seen as important innovation and knowledge capital creators and circulators (Yigitcanlar, 2010), expected to contribute to their immediate surroundings by enhancing its innovation capacity and thereby spurring economic development (Arbo & Benneworth, 2007). Within these discussions, the regional innovation system (RIS) has emerged as a common approach highlighting how knowledge and innovation can be created through interactions between different institutions and actors, differentiating here two subsystems, the knowledge generation and the knowledge exploration subsystem (Asheim, Grillitisch, & Trippl, 2016; Cooke, Gomez Uranga, & Etxebarria, 1997). Driving knowledge-based regional development requires ensuring that these actors are effectively coordinated to better orchestrate the exchange of knowledge between them, thereby facilitating innovation.

The RIS approach has often been interpreted to mean that problems in regional innovation systems are either due to missing elements or to weaknesses in orchestration between the subsystems. From 2000 until the mid-2010s, the common policy approach was addressing regional innovation weaknesses by identifying gaps within RISs and then developing new activities and intermediaries to fill those gaps. This systemic understanding has led to the idea that if components are missing in the RISs or if the orchestration of the system components is not successful, innovation is less likely to happen. But the RIS model is essentially a static model with a regional map providing nothing more than a snapshot of the current situation (Edquist, 2010), lacking any analysis of regional developments. Therefore, this 'mapping and gap-filling approach' cannot hope to provide the tools to build change or solve the problems of less innovative regions (Boschma, 2014).

Following Benneworth, Pinheiro, and Karlsen (2017), we argue that gaps in

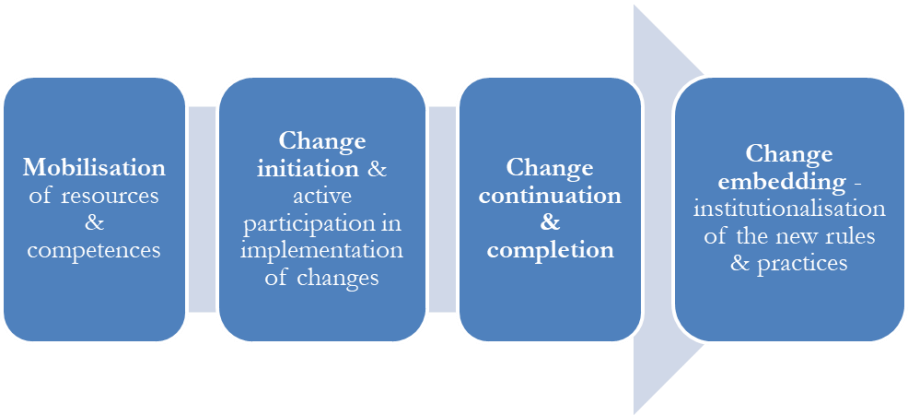
regional innovation systems cannot 'just' be filled in a simple manner. There is no 'ideal' RIS model against which a region can be compared to identify gaps, and from which best practices can be cut and pasted in order to raise levels of innovation and ultimately economic growth. Following Edquist (2010), we note that effective improvements to regional innovation arrangements are constructed at the micro-scale by actors situated within these evolving regional contexts. These micro-scale improvements initially represent a single act of knowledge exchange between an academic and a user, but over time, the interaction can become consolidated into a relationship, and possibly even a network. This network then may influence other partners, creating behavioural changes at the wider regional level that may, therefore, improve overall regional innovation performance.

5.2.2 Institutional entrepreneurship

We create a framework to conceptualise how individual academics construct innovation relationships that have the potential to have this wider systemic effect. We use a lens of institutional entrepreneurship, which offers "a way to reintroduce actors' agency to institutional analysis" (Leca, Battilana, & Boxenbaum, 2009, p. 3). Institutions are the socially constructed rules of the game (North, 1990) defining agents' behavioural patterns within their institutional system. Systematic and institutional change is a complex process involving different agents, continuously influenced and constrained by the very institutions they are trying to change. Sotarauta and Suvinen (2017, p. 12) highlight that institutional change, often construed as being straightforward ("melt the old, change, freeze again"), can, in reality, be seen as "processional" and a nonstop equilibrium-seeking patchwork of action. Institutional entrepreneurs are often not as 'free' as expected due to "rigid structures, politics, major economic layers, and formal policies" (Sotarauta & Pulkkinen, 2011, p. 101). Understanding and stimulating institutional change requires a focus on the agents and activities attempting that change, with Benneworth, Pinheiro, and Karlsen (2017) suggesting a focus on those institutional entrepreneurs who "mobilize resources and actionable knowledge to create/transform 'institutions' […] to address RIS inefficiencies" (p. 237).

Institutional entrepreneurship is understood as a form of agency with a processual and collective nature – different institutional entrepreneurs are mutually inter-dependent on each other and their collective activities. Institutional entrepreneurs can only change institutions through collective action, necessitating mobilisation and cooperation with allies (Leca, Battilana, & Boxenbaum, 2009). Effective institutional entrepreneurship does not simply require identifying or empowering "heroic" leaders but includes the mobilisation of skills, resources, and constituents, as well as the de-legitimisation of existing arrangement while establishing and legitimising new arrangements. Sotarauta and Suvinen (2016, p. 7) suggest that activities of institutional entrepreneurs can be distinguished into four phases (Figure 7) with earlier phases initiated through individuals in unplanned and indirect processes, conducted in a very personal and intuitive manner.

FIGURE 7. ACTIVITIES BY INSTITUTIONAL ENTREPRENEURS



SOURCE: AFTER SOTARAUTA AND SUVINEN (2016)

5.2.3 Academics as institutional entrepreneurs

Sotarauta and Pulkkinen (2011) highlight that relatively little academic and policy literature addresses individuals' roles as active change agents in regional development. In this chapter, we therefore address the roles of academics as individuals building innovation activities with regional partners that may ultimately lead to new systematic opportunities for regional economic development (Battilana, Leca, & Boxenbaum, 2009; Garud, Hardy, & Maguire,

2007; Sotarauta & Pulkkinen, 2011). This has been relatively ignored in recent years, with notable exceptions such as Pugh, Lamine, Jack, and Hamilton (2018) who examine the role of academics from entrepreneurship departments in driving regional economic development, and by Aranguren, Guibert, Valdaliso, and Wilson (2016) who study universities and academics that seek to act as 'change agents' in the development processes of their regions.

Any attempt to address academic institutional entrepreneurship need to account for the fact that universities are loosely coupled communities (Weick, 1976), in which different actors have different behavioural repertoires that relate to the needs of their knowledge processes (teaching, research and engagement). Thus, the university actors undertake engagement in ways that fit with their own knowledge needs: The biotechnologist licenses technology to a business or the humanities scholar works to help a museum produce a popular, accurate exhibition catalogue. Those engagements may involve the various activities in Figure 7 and therefore represent acts of institutional entrepreneurship that both support the innovation activities as well as change the nature of the host institution they are in. Those development outcomes "require social action by knowledgeable pioneering individuals, universities, companies and/or governments" (Simmie, 2012, p. 769). Conversely, the "unplanned, highly personal and intuitive nature of institutional agency" (Ritvala & Kleymann, 2012, p. 493) can be observed in that academics often do not realise the depth of their activities and the impact those can have.

To date, there has been a tendency to assume that university agency lies with senior management and that effective regional engagement starts with those managers identifying 'regional needs' with which the university can align as an institution. Thus, the role for academics becomes reduced to implementing what those senior principals demand (top-down change). By contrast, we contend that effective regional engagement involving knowledge activities must be initiated by individual academics building links with regional partners in ways that allow that knowledge to flow. Here, the role for senior managers is changing universities in ways that allow those academics to develop connections that support the underlying knowledge activity (bottom-up change).

This requires extending the scope of analysis beyond the formal mechanisms and structures created by universities for the purpose of engagement. We specifically zoom in on the pathways that academics themselves create to facilitate informal, soft activities and engagement that often happen through networks. As Pugh *et al.* (2018) find, "informal linkages to the region have a more complex structure, formation and enactment, and are often curated or developed by individuals" (p. 1850). Softer, networked activities mobilised by institutional entrepreneurs may ultimately have wider institutional effects, both by interacting with and becoming integrated into the formal engagement infrastructure, but also in shaping the creation of new formal policies and strategies related to regional engagement.

In this chapter, we therefore operationalise our overarching research question using these concepts to ask "*How can regional policy activate and support university institutional entrepreneurs active in their regions?*". We focus on the ways in which academic institutional entrepreneurs were empowered or constrained to undertake acts of institutional innovation creating soft networks, and the consequences that had for the embedding of those soft networks within their parent universities' hard infrastructures and central strategies and policies. We aim to understand how regional policies can support those institutional entrepreneurs already engaged and motivate those actors that are not.

5.3 Methodology and case studies

5.3.1 Methods

In this chapter, we seek to apply our conceptual framework to understand whether institutional entrepreneurs can drive internal-institutional change through their engagement activities. Our conceptual framework identifies a potential mechanism by which this happens, namely mobilisation processes leading to change in universities' institutional pillars, but we do not yet understand the ways in which these mechanisms link to institutional change. We therefore seek to sharpen our conceptual framework, better define the categories in our model and understand their relationships and dynamics. This requires creating a deep understanding of the empirical situations in which individual

behaviours and events can be meaningfully identified as corresponding with elements of our model. This suggests the need for a qualitative approach generating deep understanding. We also want to create a more general model and therefore – to avoid our refinements reflecting one outlying situation too closely – we choose a comparative case study approach, generating a deep understanding of multiple cases from which our underlying conceptual model can be enhanced. We thus need to select a number of cases where there are observable occurrences of university academics creating engagement activities that have broader impacts at the university institutional level.

Consequently, we select cases from universities in regions where there is a long history of the universities engaging with regional partners to improve their regional environments. We selected three universities that are members of the European Consortium of Innovative Universities (ECIU), a group of universities "with collective emphasis on innovation, creativity and societal impact, driving the development of a knowledge-based economy" (ECIU, 2019a, see next section for more details). We selected three examples of researcher-led engagement projects that had some kind of visible effect on the engagement, namely the Fraunhofer Project Center at the University of Twente, the Creative Science Park around the University of Aveiro and the Matchmaking Scheme around Aalborg University.

The data for the three cases were collected through 21 interviews with academics and key policy stakeholders in all three regions as well as document analysis, always aiming to ensure the case studies' direct comparability. The documents, such as newspaper articles, project reports and collaboration agreements, were used to contextualise the information given within the interviews. The interviews followed a semi-structured pattern with an interview guide that assured the overall direction; the diversity of interview partners as well as the particular questions and thematic focus varied from case to case. Within the three cases, it is possible to see the effects played by different regional contexts, in terms of different regional settings, university management styles and regional stakeholders. The interviews were conducted under a condition of confidentiality and anonymity, thus, the identities of interview partners cannot be exposed.

5.3.2 Introduction to the case studies

The ECIU is a consortium of universities who profile themselves in terms of the contributions they make through their entrepreneurial, proactive and innovative regional engagement practices. Founded in 1997, the universities in the consortium emphasise innovation and entrepreneurship and aim to develop an entrepreneurial and innovative culture within their walls as well as bring it to industry and overall society. They describe themselves as "pioneers in pursuing an innovation agenda" (ECIU, 2019b) and have shown to develop a wide set of experiences on how to deal with innovation and entrepreneurship in their education and research activities as well as their knowledge exchange activities. ECIU universities claim to be regionally focused and to facilitate internal as well as external innovation and entrepreneurship and represent a reasonable sample of universities within which we might be able to address our research question. All three universities showed relevance to regional governance arrangements, extending their traditional education and research missions to include missions of industrial and regional engagement. In 2019, the ECIU was one of 17 Consortia awarded European University status by the European Commission (European Commission, 2019).

University of Twente (UT)

UT is located between the cities of Enschede and Hengelo in the Twente Region on the Netherlands' eastern border. The technical university was created 1961 to "reanimate" a region suffering from the consequence of an economic downfall driven by the decline of the textile industry and associated sectors such as metal-working and precision engineering (Benneworth & Hospers, 2007). Created as an "innovative and experimental institution… [that] survived largely by reinventing itself as a source of new growth for the region" (Benneworth & Pinheiro, 2017, p. 311), the UT's regional mission has materialised itself through different activities and projects according to different leadership styles and prioritisation efforts. Early examples of this are the implantation of the spin-off & entrepreneurship programme TOP since 1984, the creation of the business and science park Kennispark together with other regional stakeholders in 1989 as well as the role of the UT in diverse regional development programmes and

boards nowadays. More recently, the emphasis has shifted to creating strategic investment and reach-out units, such as the Fraunhofer Project Centre, which will be the focus of the UT case presented in this chapter.

University of Aveiro (UA)

UA is situated in the Centro Region of Portugal in the municipality of Aveiro, one of the constituent members of the inter-municipal community of the Region of Aveiro (CIRA) which counts 370,000 inhabitants in total. The university was created in order to focus on and attend to regional needs, with many of the initial degree programmes being focused on meeting the demands/needs of the local industry (Rodrigues & Teles, 2017). Being committed to its region and the extant regional partners since its creation in 1973, it has developed a range of infrastructures facilitating knowledge exchange and technology transfer such as the technology transfer unit UATEC, incubator facilities, a pro-rector for interinstitutional cooperation in the areas of regional development and policy and a vice-rector for university-society cooperation. Working together in close partnership to define the Territorial Development Strategies for the 2008-2014 and 2014–2020 periods created a close relationship between the university, CIRA and the business association AIDA. Since 2007, these partners have worked to realise the Creative Science Park of the Aveiro region which opened in 2018. This example provides the basis for the empirical evidence regarding the Aveiro case, which focuses specifically upon consistency and commitment of engagement between the partners.

Aalborg University (AAU)

AAU was established in 1973/74 as part of wider attempts to maintain the region's attractiveness and renew the local industries, then dominated by construction, shipbuilding, food and agriculture. The university is located in Aalborg the capital of the North Denmark Region, encompassing 11 municipalities with a population of 580,000. The first degrees established showed a strong emphasis on technical and engineering fields, ensuring a strong connection between AAU and regional industries. The pedagogical model of problem-based learning (PBL) was established at the point that the university was created, enhancing the engagement with external partners through applied

project work of students. Today, the regional industry has a strong technology focus and is R&D-based – characteristics that are often claimed to relate back to the AAU. Examples of strong engagement between the university and the regional stakeholders are AAU's engagement in the science park NOVI and common cluster initiatives that are internationally known (such as the ICT cluster BrainsBusiness). The initiative analysed in the next section is a Matchmaking System established to create clearly defined connectors between AAU and its external partners.

5.4 Individual institutional entrepreneurship processes

In this section, we set out the activities undertaken by academics as institutional entrepreneurs following the four-step framework outlined above. The case of the Fraunhofer Project Center illustrates the energy and effort required to fit an external partner into a university campus, even where the university had notionally created a set of mechanisms to make it easier for external agents to set up within the former campus area. The Creative Science Park case in Aveiro illustrates the ways in which academics can create a conceptual space for a notion then mobilising policy partners to support and realise that notion, even if the passage of the idea to those partners can lead to unpredictable deviations from the original academic idea. The Matchmakers scheme at Aalborg University highlights that institutional entrepreneurs can and do thrive perfectly well away from the managing centre, and even if senior university managers withdraw support for a scheme, institutional entrepreneurs may continue their activities despite these policy shifts.

5.4.1 Fraunhofer project centre

The creation of the FPC can be traced back to a long-standing set of ad hominem collaborations between researchers at the University of Twente, and those at the Fraunhofer Institute, Europe's largest application-oriented research organization, at the level of central management as well as specifically with the Aachen Institute for Production Technology (IPT). In January 2017 the UT, Fraunhofer IPT and Saxion University of Applied Sciences established a joint Fraunhofer Project Centre (FPC) for 'Design and Production Engineering in

Complex High-Tech Systems'. This had been prompted by a number of UT academics visiting Fraunhofer installations in regions similar to the Twente region, which in turn kick-started a discussion amongst different partners within Twente as to whether a project centre in Twente could serve as a mechanism to link the UT with local SMEs.

In mobilising the opportunity to create a Fraunhofer facility at the University of Twente, it was necessary to find a way to fit that external structure into the overall structure of the university. The FPC was initially placed within the department of mechanical engineering, but it became quickly evident that a department did not have the necessary flexibility in terms of risk management or staff policy to support this centre. To promote the idea of the FPC as a university-wide activity, project leaders projected the idea that it offered a wide range of institutional connections and opportunities, with minimal risk. The decision of the university board to approve the formal establishment of the system indicates that some manner was found to fit FPC into the university's structure. However, project staff reported that simply arranging this fit between the FPC model and the UT business model involved a substantive and draining struggle for the project leaders before any progress had been achieved around the practicalities of establishing and developing the centre. Indeed, the difficulties that were experienced in fitting FPC into the structures of the UT led some interviewees to remark that simply getting the permission of the university felt like a victory in itself.

Change initiation happened when the idea transformed into a project and the search for a suitable funding model started. The German Fraunhofer funding model envisaged that there would be a mix for the funding of 1/3 public money, 1/3 private investment/industry and 1/3 project money. Fitting that funding model into the Dutch environment was an institutional challenge faced by the actors involved. Different institutional entrepreneurs within UT were able to activate their regional networks to arrange that the Province of Overijssel would cover the public financing element. An FPC manager commented, "I cannot say that it only [worked out] because of personal relationships, but if you have a good story, and you know who to access and you make them understand the rationale

behind the direction you want to go, you can convince them". Similarly, several private companies – many regional – were introduced to the FPC initiative, and first "quick scans" would later lead to bigger projects. The brand name of Fraunhofer – as well as already existing connections to the industry (for instance through student placements) – were regarded as being supportive in creating a base of interested companies.

Although the centre was initiated and running, the continuation of change turned out to be complicated as the FPC did not fit into the prevailing institutional setting of the university. Thus, many small developments, ideas or changes became disruptive and required immense efforts by the institutional entrepreneurs. Examples for these challenges were the initial lack of interest and motivation of professors to participate in Fraunhofer projects due to academic pressures, the prohibition on putting up a sign of the centre due to university rules that forbade names and logos around the campus, issues around square meter rent prices for the Fraunhofer installations, etc. It became clear that building upon what had already been established was difficult. Objectively the project was fulfilling every expectation that was set out; "we had a business plan and we are always above the expectations", nevertheless, tensions prevailed.

Finally, subsequent events revealed that only limited institutional embedding had taken place. The mismatch of the Fraunhofer Project Center with the institutional systems of the UT was laid bare as the institutional entrepreneurs found themselves having to continuously push for the FPC to take the next small steps in its development. At the time of writing a discussion of moving the FPC to the adjacent Business and Science Park – therefore offsite from the university – had started. A person involved in this process claimed that with this step, it would "become really visible as a separate entity" and would be able to interact closer with the industry. At the same time, instead of becoming more embedded in the university's infrastructure, the FPC would be leaving the university system to become independent of the university. We contend that this fits with the idea of the FPC rationally not fitting in the university and "being treated as a foreign body".

5.4.2 Creative science park of Aveiro region

The Creative Science Part of the Aveiro Region was opened in 2018, after a formation process between a set of diverse stakeholders lasting more than ten years. The project started with some very enthusiastic stakeholders within the university that had the idea of building upon the already existing relationship with regional governmental bodies such as municipalities and the inter-municipal community (CIRA) as well as with companies and industry associations. A professor involved in the process explained "it all started exactly in the university and then we looked for partners in the region. Then we started to discuss with the municipalities. It evolved from that". While different ideas about what could be created (such as an industrial area or a real estate park) were exchanged between the partners and the feasibility of the different ideas was checked, the idea of a science park that would not lead to increased competition between the already existing industrial zones of the municipalities emerged.

In terms of mobilisation, different institutional entrepreneurs within the university clearly played different roles in the project. There was extensive research conducted by different actors on possible science park concepts that would fit with the regions setting and necessities. These ideas were exchanged back and forth between the university actors and other stakeholders, with the aim of defining the ideal science park model that would suit everyone's interest. An UA employee involved at this stage of the process highlighted the ability of the involved institutional entrepreneur in "understanding the language of people in the region" and being able to translate between different stakeholders. Through the institutional entrepreneur's international networks direct connections and communication with science parks around the world were established, experiences exchanged and even some fact-finding mission to science parks conducted.

Change initiation happened when an (apparently) joint decision on the science park model was made and funding distribution between the partners was agreed upon as well as external funding secured. The chosen model, heavily based on the science park in Tampere (Finland), was explained to focus on the existing companies in the region, and a university employee explained that it would be

"closer to firms than the traditional science and technology park". What was not clear to the different stakeholders at this phase was that they had only supposedly agreed on a model, while in later stages it was notable that especially the municipalities were still hoping to attract new companies – thereby seeing it primarily as a real estate project. As was later to become clear, there was no real consensus on the content of what had been agreed, whether it was to construct a set of technology transfer services or to attract new businesses, and it was the latter that was important to municipalities. A university employer critically claimed that "what they [the other participants of the study trips] saw were buildings and not so much these institutional bases, which is much more important than the building".

The failure of understanding each other's definitions of the 'common idea' – and realising that there was not as much commonality as assumed – was the start of a change continuation coined by complications and drawbacks. Competitions around the selection of the suitable location of the future science park as well as comprehensive changes within the UA teams were reported by the interview partners. Especially the second point, of university employees leaving their positions within the teams that were engaged with the science park process, shows that institutional entrepreneurs became disengaged at this stage. An interview partner involved before and after these changes explained that with the entrance of a new rector team a "more traditional way of seeing these sorts of knowledge transfer" was introduced, thereby challenging the perspectives and activities conducted by many of the IEs. As the different partners were busy fighting their own battles of location and team membership, they failed to present themselves as a coherent body standing against additional external pressures – such as demonstration of an environmental agency against the chosen location – that emerged along the way.

The story of the science park and the role of the academic institutional entrepreneurs shows nuances of successful change motivation and initiation as well as complications throughout the change imitation and embedding. While the university and the respective IEs were very enthusiastic in the beginning and conducted extensive groundwork, the model of the park as well as the changing

support through a new rectory team, suddenly turned the process around. The original plans of the institutional entrepreneurs were thus questioned, the university interests not guaranteed – one could even say they were trumped – and therefore many institutional entrepreneurs disengaged. The science park was still opened, taking double the time than originally planned, and the university's engagement within this process was slowed down.

5.4.3 Matchmaking system

In 2007-2008, Aalborg University – in cooperation with the North Denmark Region – initiated the creation of a new cooperation infrastructure between the university and its external partners, especially those in the business promotion system. The new infrastructure had the goal to facilitate the exchange of knowledge between the university and external stakeholders, with a particular focus on companies such as SMEs who had limited connections to AAU – often found in the outermost areas of the region. This new infrastructure was to consist of two elements, a matchmaking secretariat tasked with handling project management as well as the organisation of matchmaking activities and so-called 'matchmakers' tasked with becoming knowledgeable intersections between the university and third parties. Three categories of matchmakers were created: (1) university-internal matchmakers (researchers in each faculty), (2) university-external matchmakers (in municipalities, business associations and other institutions) and (3) student 'matchers' (students with special responsibility for promoting the students' collaboration with the business community).

The project was initiated by different stakeholders around AAU Innovation, aiming to create new entry and exit points to and from the university. A university manager very involved in this process explained that the goal was not to centralise engagement tasks but to mobilise more stakeholders and 'build' new doors. They clarified that they were applying a 'no-wrong-door' policy in contrast to the often praised 'one-door' policy. This model was seen as a clear fit to the regional needs and funding was made available by the regional growth forum, a body combining different stakeholders within the field of regional development who are involved in the decisions on the distribution of European and national funds (OECD, 2009). In the first phases of funding, the matchmaking secretariat was installed

and the identification and induction of matchmakers started. The deans of the different departments, as well as managers of municipalities and business associations, were asked to appoint matchmakers within their institutions. Interview partners claimed that most of these newly appointed matchmakers were already engaging with external partners and therefore did not have to change their activities in any significant way.

Change initiation happened in that the appointed matchmakers started getting to know each other personally – as well as the institutions which they were representing – through first meetings and activities. An example of such a meeting was the annual matchmaking conference in which keynotes were given, institutions introduced and an informal way of getting to know each other was established. While some of these activities were described to be rather symbolic and it was questioned whether they fulfilled the matchmaking purpose – such as the official awarding of 'matchmaking certificates' – other participants explained that they were able to create new contacts and a better understanding of the partners' needs and possibilities through the new matchmaking infrastructure. In parallel, the matchmaking secretariat started introducing activities such as 'municipality tours' (taking students to companies in specific municipalities) or 'solution camps' (a company posing a particular challenge and students participating in a structured process of defining possible solutions to it). These different activities were said to have systemised some of the existing activities and created new forms of engagement.

After the first years of the matchmaking project terminated, some internal changes of the university management, a restructuring of AAU Innovation and changes in the leadership of the university as well as the matchmaking project marked a change in the project's development. While the matchmakers that were already well connected continued with their matchmaking tasks, potential new matchmakers (who received the matchmaking tasks when people left their positions) were often not aware of what this actually meant. An external matchmaker claimed that they were never contacted, did not know what was going on within the university and had no clear idea of what the task actually entailed. New leadership started setting new priorities, aiming at one-door-

policies and introducing the idea that engagement and collaboration had to bring clear advantages for AAU. While the system still received funding, the new priorities shifted the nature of the infrastructure. A manager within the system explained that while the "old innovation director was very much focused on listening to what's going on out there and what the [potential external partners] want", the new management was focused on the university's needs and prioritised the educational system. This new focus of the matchmaking project was said to be on proactively connecting students to companies, giving external matchmakers as well as researchers a passive role.

In the beginning, the project, activities and tasks were managed flexibly and engagement between stakeholders was said to have started to grow. Nevertheless, the long-term changes that were hoped to be achieved according to the original plans of the matchmaking system were not easily embedded into the university structure. A manager within the matchmaking project claimed that the system was not "properly implemented at the university". While the model of systemic transformation seemed to have worked in the first years, it failed to deal with internal tensions inside the university after leadership changes and an exogenous transformation occurred due to the shift of priorities. While different disciplines had different knowledge and production needs (different doors), the matchmaking infrastructure seemed to have been a better fit for some departments than for others. Thus, the attempt by the second team of matchmaking leadership to streamline knowledge engagement and create one rational entry system to the university challenged the idea of the original IEs.

5.5 Factors affecting regional institutional entrepreneurs' behaviour?

We have asked the operational research question of how regional policy can activate and support university institutional entrepreneurs active in their regions. On the basis of the three case studies, we can recognise different elements that motivate and advance institutional entrepreneurs as well as elements that demotivate or even block the advancement of institutional entrepreneurs. We outline the most salient positive and negative elements and then identify how

regional policy can make use of these elements and play to the intrinsic motivation of academics, in devising mechanisms that allow academics to flourish as institutional entrepreneurs. These factors are summarised in Table 10 below.

TABLE 10. FACTORS THAT ENCOURAGE AND DISCOURAGE UNIVERSITY INSTITUTIONAL ENTREPRENEURS

Factors encouraging institutional entrepreneurs	**Factors discouraging institutional entrepreneurs**
Regional partners signalling to IEs that their ideas are of value and should be considered	Impossibility for long-term planning in term of the institutional entrepreneurs due to continuous university-internal changes
Regional partners considering the ideas of institutional entrepreneurs and entering into co-creation processes to develop the ideas further	Inflexibility in terms of creating settings that allow trial and error phases for testing new projects and institutions
Continued support of external partners through complicated times even after some IEs disengaged	Complications in actually connecting global pipelines with local partners

SOURCE: AUTHOR'S OWN ELABORATION

Firstly, what helped the institutional entrepreneurs in our cases was the fact that regional partners provided academics with clear value signals. In all three case study regions, the academics – motivated by the wish to 'create something big' within their particular academic context – started talking to regional partners from institutions such as companies, municipalities or cities. This was most obviously evident in the case of Aveiro and Twente, where the IEs were already very well connected to mayors and leaders of the main business associations (Aveiro) as well as regional companies and decision-makers at the Province level (Twente). Thus, the IEs were able to approach people directly and translate their ideas into concrete plans (a science park or a Fraunhofer centre) that were received by regional partners with interest and support. The fact that regional partners signalled to IEs that their ideas were 'something worth doing' then gave the academics the signal to keep working on it internally.

Secondly, the co-creation of the ideas is related to the issue of value signalling. Regional partners did not straightforwardly adopt the academic ideas but rather took a step forward together – from discussing all the possibilities to deciding which possibility they want. By constructively thinking through the academic's initial idea, regional partners and IEs created something around which the

partnership could coalesce to co-create a proof of concept. The best example of this was seen in Aveiro with the emergence of the idea of creating the science park as a project owned and realised by all regional partners as a joint initiative. Similarly, in North Denmark, the business development offices of municipalities, the regional growth house and representative of industry associations became involved in co-defining who their regional matchmakers would be and how they would evolve within the matchmaking infrastructure. Thus, the academics were particularly motived by the encouragement and involvement of regional partners in translating their initial idea into reality.

Our case studies all show that continued support and engagement from external stakeholders through difficult periods was vital for the initiatives' survival. Stakeholders such as governmental bodies or business partners kept engaged in the different projects even after some academic IEs disengaged because of internal hurdles or personal complications/disagreements. The matchmaking infrastructure provides an interesting case in this regard, with some partners disengaging after internal university changes triggered complications in the change process. Nevertheless, there were some partners from the region and the municipalities that did not withdraw at that point, and kept engaging with the IEs to sustain the project and develop it further. Similarly, in the case of the Aveiro Creative Science Park (hereafter the CSP), changes in the stakeholder constellation saw some IEs leaving the project, and leadership was then adopted by other partners. Although these partners might have shifted the priorities of the project significantly and lengthened the duration of the creation of projects, it is clear that this ongoing support was necessary to ensure that the science park was eventually created.

There were also elements that blocked the IEs in the three different cases. Firstly, internal institutional change was undermined by the fact that there was no possibility for the IEs to plan or think long-term. A significant example of this was the changes in the matchmaking project after institutionalisation seemed to have been working effectively in the first years. The changes in the university and matchmaking leadership, the modification in terms of priority areas, and the projectisation of the matchmaking infrastructure clearly slowed down the

embedding process and prevented institutionalisation. Similarly, due to the commencement of a new rector in 2018 at the UA, a race to deliver the CSP started because the outgoing rector wanted to be in a position to formally open this new infrastructure. It was then opened while still being largely empty and some interview partners claimed it had been opened prematurely.

Secondly, we identify examples of missing flexibility in terms of the setup and installation of these new projects within the existing university infrastructures. In the case of the FPC in Twente, difficulties appeared when the Center was first attached to a specific department – experiencing restrains in terms of hiring new personal and financial freedom. Thus, IEs promoted the idea of de-coupling the centre from any department and leaving it 'independent' under the direct supervision of the university board – a process that sapped time, resources and energy, with the university not being prepared or sufficiently flexible to accept such a new setting.

Finally, in all three regions, the IEs aimed to create global pipelines into local buzz partnerships, but because they were located in university settings, achieving this global-local cross-fertilisation was not always easy. This was most evident in Twente and Aveiro: The FPC was created with the goal to conduct internationally relevant research in the area of design and production engineering which was then supposed to be applied to regional SMEs. While the FPC effectively built global connections, it did not necessarily create the intended local buzz – the focus on local cross-fertilisation was partly replaced by focusing on international companies from anywhere in the Netherlands and Germany. In Aveiro, the CSP was aimed at attracting international researchers, themes and projects that would then connect to the regional companies and create local buzz in the 11 municipalities.

5.6 Concluding discussions: creating regional policies that support academic institutional entrepreneurs

This operational analysis provides the basis to address our overall research question of how entrepreneurial universities create (or do not) frameworks which enable purposive actions by academic actors to participate in regional

development outcome. By exploring three case studies of institutional change processes initiated by academics in universities claiming to be highly engaged and open to their surroundings and innovative change, we highlighted several elements that variously enabled change or hindered change embedding respectively. We explored how institutional entrepreneurs in universities can create new institutions through a process in which change is first mobilised, then initiated and continued and finally embedded (Figure 7). In the following, we will thus explore what regional policy can learn from the above outlined motivating and blocking elements and how it can react in order to secure more institutional entrepreneurs. These policy findings are summarised in Table 11 below.

TABLE 11. POTENTIAL POLICY INTERVENTIONS TO BETTER SUPPORT UNIVERSITY INSTITUTIONAL ENTREPRENEURS

Supporting encouragement of institutional entrepreneurs	**Addressing discouragement of institutional entrepreneurs**
Create an apparatus that allows academics to translate intangible ideas into deliverable, tangible outcomes	Secure long-term frameworks by demanding institutions to sign up for long-term planning periods
Create opportunity spaces for regional stakeholders to co-create and test ideas	Encourage the creation of 'test spaces' in institutions that allow for checking whether/how new institutional settings could work
Continue support even through complicated phases as the partners might need some time to re-focus	Target the regional and international stakeholders and create opportunities to combine their knowledge, interest and aims

SOURCE: AUTHOR'S OWN ELABORATION

In terms of value signalling and co-creating ideas and projects, regional policy could create a mechanism/apparatus that links academics with intangible ideas to potential beneficiaries who could signal their potential value in a resultant tangible project. This is particularly important as by giving regional partners the opportunity to signal that the academic's ideas are valuable and important and by participating in the creation of a common project. Additionally, this helps to create common ground between academics and regional partners, and to legitimate those projects internally, in turn allowing academics to mobilise internal support. Regional policies should support regional stakeholders through difficult phases, as the constellation of engaged partners might change and new stakeholders – together with the still central IEs – might require additional time. Whilst it is inevitable that the constellation of partners will shift during projects,

there is a need to ensure that policies do not abruptly withdraw support and legitimacy from IEs as this has a general undermining effect on the legitimacy of engagement as an academic activity.

In terms of the need for the possibility of institutional entrepreneurs to plan long-term, the regional policy should encourage universities not to change priorities continually and instead support long-term trajectories. We noted that academics can become demotivated by shifting internal strategic frameworks and university priorities. Regional policy should seek to persuade universities to commit to engagement frameworks for a long-term period, allowing IEs more reasonable timeframes to actually initiate, continue and embed change. Secondly, regional policies should encourage universities and other institutions to become more flexible in terms of testing new institutional setups. This could give IEs the opportunity to test the projects and find a suitable setting in which they can flourish. Finally, regional policy needs to stimulate IEs to build broader international connections that are relevant for the regional stakeholders through facilitating universities to attract international knowledge and translate as well as embed this knowledge to regional needs. Policy has to work on both sides, the international and local. A key challenge here for regional policy-makers is understanding the correct balance of fundamental research, necessary to create the global pipelines, and how to ensure that globally active academics can be coupled with regional partners to use that global knowledge to create local buzz.

We know the limitations of drawing broader conclusions from three case studies, nevertheless, we seek to claim that this chapter allows us to highlight the important role of institutional entrepreneurs in universities for the engagement with the region and the start of new institutional practices. Through considering the link between institutional entrepreneurs and regional policy, we find that regional policy has an important role to play in the regional entrepreneurial ecosystem. As evidence from Nieth (2019) has suggested, tensions that might arise can be due to potentially institutional mismatches that undermine and undercut the necessary linkages between partners for effective knowledge exchange and hence universities contributing to regional development. We conclude that – because the connections between the IEs and regional partners

are vital to the activities undertaken – encouraging and building these links is a critical element that should be enhanced through regional policy.

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6 AGENCY AND ALIGNMENT AFFECTING UNIVERSITIES AND THEIR PLACE LEADERSHIP ROLES

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Abstract

There is increasing interest in the question of how different stakeholders develop, implement and lead regional upgrading processes with the concept of place leadership emerging as one response to this. Simultaneously, universities face growing expectations that they will contribute to regional development processes – often through their collaborative relationships with other regional stakeholders. But universities are complex in terms of their internal and institutional structures, which undermines their capacities to enact coherent place leadership roles. We seek to understand how strategic leadership in universities can contribute to innovation and regional development in the context of the fundamental institutional complexity of universities. We address this through a qualitative, explorative case study comparing six European regions where universities have sincerely attempted to deliver place leadership roles. We identify that the elements of agency and alignment are vital in that: firstly, university leadership has to align with regional coalitions on the one hand and internal structures on the other hand, while secondly, this leadership must give room to individuals to enact agency in their regional engagement activities.

6.1 Introduction

There is an increasing interest in and growing literature on place leadership, aimed at answering diverse questions around the agents and/or institutions that lead regions to desired future outcomes. Regional leadership has thus been

labelled as a determinant for regional growth and policymakers, practitioners and academics are eager to understand the nature, origins and different appearances of place leadership (see for instance Sotarauta, Beer, and Gibney (2017). Concomitantly, higher education institutions (HEIs) are increasingly seen as important agents in regional development, providing both generative activities like patenting and licensing, creating spin-offs and transferring technology, as well as more developmental activities that upgrade and improve their regional innovation ecosystem (Gunasekara, 2006).

Universities' developmental roles can involve both the direct upgrading of the environment as well as co-operative activities to collectively achieve those improvements, including through the exercise of leadership. To date, there has been little systematic consideration of the ways in which universities exercise place-leadership (Benneworth, Pinheiro, & Karlsen, 2017) and it is a natural process to wonder where HEI's can be situated in the leadership puzzle. Within this context, we pick up a discussion initiated recently, in that a better understanding of the role of agency in policy and development processes is needed (Uyarra, Flanagan, Magro, Wilson, & Sotarauta, 2017). In parallel, we note that universities' place leadership roles inevitably reflect the complex institutionality of universities as 'loosely coupled' institutions facing mission overload and struggles of internal leadership. Therefore, in this chapter, we reflect on the way that complex organisations (universities) can exert place leadership, and specifically the relationship between universities' internal organisational structures and their capacity to exert place-leadership. Interested in the ways 'strategic leadership' in universities contributes to innovation and regional development within the wider context of these overall institutional architectures, shaping their achievement potential, we ask: To what extent does universities' institutional architecture affect their regional leadership roles?

We address this using a comparative case study that crosses six national and regional settings (Aveiro (PT), Lincolnshire (UK), North Denmark (DK), Satakunta (FI), Vallès Occidental (ES) and Twente (NL)). Our analysis shows that the different leadership roles taken by HEIs are dependent on a diverse set of factors, like regional settings, relationships with regional partners and the

internal institutional structure within which universities operate. We use this empirical data to develop a better conceptualisation of university place-leadership and the way internal structures (top-management, administrative machinery, academic tribes, support structures and coupling/co-ordinating institutions) are in interplay with top management. These five elements provide us with a basis to, firstly, sharpen the concept of university place-leadership and problematise that internal complexities and misalignment of actors within the university structure often limit external leadership. On this basis, we argue that a model must be found in which alignment (internal and external) as well as individual agency are combined.

This chapter is structured as follows: the first section develops a model of university elements relevant for regional leadership activities and provides an overview of the literature relating to regional leadership roles and universities in regional development. The next section outlines the data and research method and provides an overview of the cases. Section 4 describes the empirics of the six universities along the outlined elements defined before. Section 5 discusses the nature of the five different elements and how they interact and support regional leadership. Finally, the chapter closes by highlighting the implications of our analysis for policy and present concluding comments.

6.2 Understanding practical constraints on university regional leadership

Universities' regional policy roles are commonly discussed as if they were part of higher education's legally mandated responsibilities, which confuses two complementary elements of universities' contributions. Universities' generative contributions occur as a side-effect, through spillovers from university knowledge communities resulting of physical proximity and occurring simply by the HEIs' presence. However, developmental contributions rely on the exercise of leadership by university managers, with no a priori reason why universities should choose to do this. After all, universities are not development agencies nor private businesses and, though they receive public funding, there is no reason why they should arbitrarily restrict their societal contributions to an arbitrary

region chosen for strategy-making purposes. Concomitantly, universities do benefit from their regions in terms of the ways those regions benefit their knowledge communities. Therefore, the art of leadership by higher education must be understood as a search to construct mutually beneficial sets of knowledge activities that drive regional innovation as well as enrich innovation activities.

6.2.1 The contemporary innovation policy challenge

In recent years, knowledge has become increasingly recognised as the key to unlock economic growth, productivity and competitiveness. The rise of the knowledge-based economy (cf. OECD, 1996) has made the interactivity inherent in the transmission of knowledge between markets, policy, science and technology an essential driver of innovation dynamics (Edquist, 1997; Krammer, 2017). This is particularly the case when considering the territorial dimension, as collective learning mechanisms are more easily developed in more local and regional levels (Goddard & Chatterton, 1999; Morgan, 1997; Santos & Caseiro, 2015). It is therefore unsurprising that public policies, namely science, technology and innovation policies, have emphasised the role of networks and knowledge-intensive actors – especially HEIs – in stimulating regional competitiveness in what is an increasingly global context (Arbo & Benneworth, 2007; Drucker & Goldstein, 2007; Smith, 2002).

Innovation policy has become ever more important to driving regional economic development, and more place-based approaches reflecting on contextual variances have further emphasised this (Barca, McCann, & Rodríguez-Pose, 2012). McCann and Ortega-Argiles (2015) argue that innovation is highly influenced by factors such as population density, economic diversity and regional market potential. This implies that peripheral and less-developed regions tend to be disadvantaged, characteristically by low local business demand for innovation, inefficient locally-based R&D activities and a lack of inter-institutional interaction (Huggins & Johnston, 2009; Rodrigues, Rosa Pires, & Castro, 2001). However, with policy discourse coordinating new knowledge-based, place-based and collective approaches to regional development innovation policy, which consider not just infrastructural but also institutional and social dimensions in

fostering collective learning and territorial competitiveness (Morgan & Nauwelaers, 2003; Santos & Caseiro, 2015), these development gaps may be bridged.

The Smart Specialisation framework emphasises this explicitly, as a tailored policy aimed at decreasing regional disparities by exploiting and promoting innovation's collaborative character. Central to smart specialisation is a partnership-based policy process of entrepreneurial discovery constructing regional advantage (Foray, 2016) based upon a vision in which 'partnerships […] are essential in order to elicit the knowledge regarding the most severe obstacles to growth, the major bottlenecks or missing links, the optimal remedies' (McCann & Ortega-Argilés, 2015, p. 1289). These stakeholder partnerships have been referred to as multi-level partnerships (Morgan & Nauwelaers, 2003), regional innovation coalitions (Benneworth, 2007) and regional innovation networks (Rodrigues & Teles, 2017). While these policies tend to expect stakeholders to work together straightforwardly (as 'happy family stories' (Lagendijk & Oinas, 2005)), recently, the urgent call for a consideration of agency has been voiced (Uyarra et al., 2017).

At the same time, the extent to which regional leadership is emerging in practice and enabling strategic steering of regional development is in question. Leadership, understood as a capacity to unlock collaborative engagement in a 'sustained' and 'purposeful' manner, can be seen as transformative and highly impactful in performance (Bass, 1990; Stough, DeSantis, Stimson, & Roberts, 2001). Regional place-based leadership in particular is necessarily a collective endeavour, delivered as much through the effective roles that key regional actors perform, their influence and significance, as their formal institutional titles (Sotarauta, 2014). This raises the issue of which leadership roles can be played by universities in regional innovation coalitions.

6.2.2 The complex institutional dynamics of universities

The importance of higher education in supporting economic growth has become increasingly evident across a range of policy frameworks (Roper & Hirth, 2005; Vorley & Nelles, 2009; Zomer & Benneworth, 2011). Universities' regional

contributions may come through a variety of interventions, from mobilising collective resources (Bergek, Jacobsson, Carlsson, Lindmark, & Rickne, 2008) through developing a more robust regional knowledge base (Asheim, Boschma, & Cooke, 2011) to directly constructing regional advantages. Policy places complex expectations on universities to function as flexible, integrated and strategic actors (Uyarra, 2010) but, in reality, responding to regional needs and embedding engagement to the academic core can be somewhat problematic (Benneworth & Sanderson, 2009; Uyarra, 2010) because of universities' internal mechanisms (Chatterton & Goddard, 2000; Foss & Gibson, 2015).

Universities' depict their regional contributions through explicit engagement commitments (Pinheiro, Benneworth, & Jones, 2012), such as strategic mission statements. But this downplays the fact that universities are not biddable organisations (Pinheiro, Benneworth, & Jones, 2012) and external interests are not necessarily aligned with those of their regions (Benneworth, Pinheiro, & Karlsen, 2014a). Universities are complex and 'loosely coupled' (Weick, 1976) organisations, held together by institutional structures. Therefore, engagement with the region – and potential leading roles in regional development – is not a straight-forward process.

Universities' regional orientations are shaped by several factors primarily related to the extent to which the knowledge activities they undertake around teaching and research can involve regional partners. This means universities' regional contributions are dependent on several external factors, such as regional job market, public funding and cultural and historic characteristics of the region (Breznitz & Feldman, 2012; Vorley & Nelles, 2012). Likewise, what universities can achieve in their regions are shaped by their existent portfolio of knowledge activities, and the extent to which internal knowledge actors can involve regional actors in these activities (Benneworth, Young, & Normann, 2017). Any serious consideration of university regional contributions – including their capacity to exert leadership in a regional context – reflect these factors, particularly regarding the extent to which their engagement activities are embedded into their internal dynamics (Vorley & Nelles, 2012).

Contemporary regional innovation policy frameworks all too quickly assume rather simplistic 'one-size-fits-all' approaches to universities' engagement (Benneworth, Pinheiro, & Sanchez-Barrioluengo, 2016; Kitagawa, Sánchez-Barrioluengo, & Uyarra, 2016). But universities' engagement cannot be effectively delivered by solely adding new engagement activities to the institutional periphery – only by rooting engagement activities across the organisation within these core knowledge processes (Foss & Gibson, 2015; Gibb & Hannon, 2006; Vorley & Nelles, 2009). To date, there have been few considerations of how universities embed engagement within their internal architectures and the consequences this has on their regional contributions (Salomaa, 2019). Therefore, we turn to consider the ways in which universities play regional leadership roles – enacted through their diverse portfolios of knowledge processes – and how they may become embedded in universities' institutional architectures.

6.2.3 Universities and regional leadership

Following Benneworth, Pinheiro, and Karlsen (2017), Clark (1998) and Nedeva (2008), we characterise university institutional architecture as comprising five elements, where each of these may or may not support the university's institutional contribution (see Table 12). First, the 'steering core/strategic leadership' is represented by senior management, which is responsible for articulating the university's strategy and policy documents, its mission and vision. The second component is the 'administrative machinery' of the university, which translates the strategic aims from top management and thereby aims to guarantee the quality of engagement, while also considering the diverse 'academics tribes' (Becher & Trowler, 2001) and their different needs and interests. The third component is 'academic tribes', i.e. either individual agents or groups of individuals. Fourth, 'peripheral support structures' are those that do not contribute directly to the core teaching and research activities but give universities capacities in other areas, like student exchange or conference facilities. Finally, the fifth element is 'internal coupling/coordinating mechanisms' that validate and legitimise universities' core activities, e.g. teaching, where committees exist to allow both medical and arts degrees – with their vastly

different contact hours and teaching methods – to both be seen as valid teaching and to warrant the award of degree status.

Each of these may find an expression in terms of their regional contribution. However, we will foreground leadership as the primary determinant of university institutional change, given that strategic leadership has the greatest capacity to exert change. The strategic leader could, thus, decide to focus on and support regional engagement, leading a discourse of engagement and freeing necessary resources. Regional leadership has a dual nature, experienced by local partners but conditioned externally. Universities regional leadership is dependent on universities' capacities and institutional architecture as a whole, and therefore we consider how its institutional architecture influences universities' capacities to exert leadership. We regard a university's institutional architecture as defined by the way that five elements relate to each other (see Table 12). The university may create internal structures that coordinate regional engagement processes/activities internally and seek to ensure that they embody the activities already undertaken by academics. There may or may not be a widespread culture of involvement of regional partners in local knowledge activities in various kinds of formal or informal ways. Peripheral structures might help academics better involve external partners in their core knowledge activities and facilitate various kinds of knowledge spillovers from the university to the region. And finally, internal coupling mechanisms – such as promotion committees – might also shape universities' capacities for regional engagement by legitimising it within the university, or as representing a lower or higher quality of higher education activity. This is summarised below.

TABLE 12. UNIVERSITY INSTITUTIONAL ARCHITECTURE ELEMENTS IN REGIONAL ENGAGEMENT/LEADERSHIP

University element	**Strategic engagement nexus element**	**External: deliver the visible benefits**	**Internal: build the activities into the university core structure**
Strategic leadership	Rector+ 'heroes'	The Rector 'platform' improving associative governance.	Rector's position evolves, seen as legitimate that wider management team pushing regional engagement

Administrative machine	The organ overseeing the rules and strategies of engagement	University administration more intertwined and integrated with regional funding and collective activities	Development of strategy and formal routines associated with engagement activities
Academic tribes	Engaged agents in academic tribes	Academics more engaged with external firms and politics fitted to core research/ teaching	More academics doing engagement and willing to undertake the task
Peripheral support structures	Structures for delivering university external engagement	Visible HEI structures (e.g. technology transfer office) active in receiving regional funding	Peripheral structures better embedded into core: projects become central organisations / institutions
Coupling/ co-ordinating institutions	The structure that exerts-asserts the power/ legitimacy of regional engagement	A clear set of policies for regional engagement that demonstrate HEI takes engagement seriously.	Peripheral engagement activities (centres of special funding) develop legitimacy, power & significance

SOURCE: AUTHOR'S OWN DESIGN AFTER BENNEWORTH, PINHEIRO, AND KARLSEN (2014B); CLARK (1998); NEDEVA (2008)

Since the capacities to provide strategic leadership are a function of the university architecture (of which strategic leadership is one element), we here distinguish between the regional leadership contribution to collective innovation activities, and then the way that that leadership is shaped by the other four elements of this institutional architecture. Our overall research question is "*To what extent does universities' institutional architecture affect their regional leadership roles?*".

6.3 Methodology and cases

6.3.1 Methodology

To address this research question, we draw upon Table 12 which provides us with a conceptual framework of the way in which the 'iceberg' of the university affects the capacity of the 'iceberg tip' to exercise formal regional innovation leadership. Although derived from Benneworth, Pinheiro, and Karlsen (2014b), this conceptual framework has not yet been validated empirically extensively. We choose an exploratory approach to understand whether universities' institutional architecture does affect the way they visibly play regional leadership roles. We are

interested in the ways in which different configurations of university institutional architecture may affect these regional leadership roles. For this purpose, a comparative multiple case-study approach across different national and regional settings was deemed appropriate to facilitate identifying patterns across cases and furthers theory-building. The case studies were selected as corresponding sufficiently to the research needs if they are regions where universities have been active in regional development, they are universities where the region is an important partner for them, and where the universities profess that they strategically choose to exert regional leadership. There is some variation here in the cases, from a small "edge city" at the edge of Barcelona's urban space to a remote Finnish region, along with four other regions going through industrial transition and with substantial rural hinterlands (Aveiro, Twente, North Denmark, Lincolnshire). This mix of variety and similarity along with the intensive case study method chosen provides sufficient depth for their interpretation through our conceptual framework to derive detailed place understandings of relationships between internal institutional architecture and external visible leadership roles.

Data collection took the form of secondary document analysis and primary data by way of in-depth, semi-structured interviews, with a similar approach in each of the regions analysed. Questions focused on the universities' organisational structure and institutional mission, their role in their region and particularly their participation in regional strategy processes. Interviewees included university staff, like top-managers at a central university level, technical and administrative staff and academics, intermediate offices and other regional stakeholders involved in regional coalitions, namely regional government authority staff (policymakers, managers, technicians) and other relevant institutional actors (e.g. businesses, industrial or social associations). The total number of interviews is 186, with the following distribution: 31 in Aveiro, 35 in Lincolnshire, 32 in North Denmark, 34 in Satakunta, 20 in Vallès Occidental and 34 in Twente. Interviews had an average duration of one hour and were recorded and transcribed by the authors.

6.3.2 Case studies

Aveiro

Aveiro region is located on the coastal area of the NUTS II Centro region between the cities of Lisbon and Porto. Composed of 11 municipalities associated in 2008 under the Intermunicipal Community of the Region of Aveiro (CIRA), it has a population of around 370.000, mostly concentrated in the city of Aveiro. It is considered less-developed under EU's categorisation, SME-predominant and geographically and sectorally diffused. However, it ranks as the third best performing Portuguese region in relative weight of GDP and exports (Rodrigues & Teles, 2017). With the University of Aveiro's (UA) implantation in the 1970s, the region has moved from a more traditional agricultural sector and stagnant industry towards more knowledge-intensive activities, mainly in the areas of ceramics, forestry, metallurgy, agro-food and ICT.

Since 2007, regional development and part of funding management have been delegated from the Centro's regional authority to intermunicipal communities like CIRA, pending their elaboration of territorial development strategies. Thus, in recent periods (2007-2013; 2014-2020) CIRA has done so through a knowledge-based and collective approach, partnering with UA, the sole HEI in the region. UA has approximately 14.000 students, not only in its main Aveiro campus but also spread throughout the territory in its four polytechnic schools. Since its creation it has developed close regional ties, emphasising an entrepreneurial approach and technical areas of regional industrial relevance such as ceramics, biochemistry, agro-food and ICT. Furthermore, at a discursive and practical level, UA has progressively considered more governance and associative-based forms of engagement, namely with local and regional government.

Lincolnshire

Lincolnshire is a large, rural region in eastern England with around 750.000 inhabitants. Its primary land use is agricultural, being the UK's biggest vegetable producer, and with the local business environment largely dominated by SMEs. Lincolnshire County Council is headquartered in the City of Lincoln, one of seven County districts. The most important strategic document driving local

innovation and economy is Greater Lincolnshire Local Economic Partnership's (GLLEP) Strategic Economic Plan. It was produced collaboratively involving many local stakeholders, including the University of Lincoln (UoL), which has assisted GLLEP in setting the priorities (e.g. food production and engineering) and in writing the plan (Regeneris Consulting, 2017).

UoL has always had a strong regional mission; the main campus in Lincoln was first established as a branch campus in 1996 after long regional lobbying for local higher education (University of Lincoln, 2010). Since then, it expanded quickly into a multidisciplinary full-range university. Currently, it has 14.000 students and 1.600 staff members across three campuses. The two smaller rural campuses, the Lincoln Institute for Agri-Food Technology, in Riseholme, and National Centre for Food Manufacturing, in Holbeach in Southern Lincoln, both serve the local agri-food sector. UoL has actively sought to meet local job market needs, of which a good example is the establishment of an Engineering school together with Siemens to facilitate access to skilled workers in the region. There are also several collaborative incentives to both strengthen graduate entrepreneurship and to attract larger businesses to the region.

North Denmark

The region of North Denmark has around 600.000 inhabitants spread over 11 municipalities, with a strong divide between urbanised city centres and agricultural, rural hinterland. In terms of its industrial profile, the region has undergone significant structural changes since the 1990s. While being dependent on traditional labour-intensive manufacturing and primary industries in the past, today it can rely on growth-oriented knowledge industries (competence clusters in industries such as IT, communication, nanotechnology). Regional development was, until 2019, the task of the regional council and the Growth Forum (GF), the later consisting of representatives from the business sector, education and knowledge institutes and public authorities (North Denmark Region, 2014). Together these representatives advise the region on their multi-year regional growth and development strategy (REVUS), as well as the distribution of funds. While the former REVUSs were described as very broad,

current strategies (especially 2014-2018 and the one designed for 2019) were said to be more focused, highlighting regional assets.

Aalborg University's (AAU) rector is a representative of knowledge and education institutions in the GF, alongside the director of the Center for Education and Business (EUC Nordvest) and the University of Applied Sciences' (UCN) rector. AAU, founded in 1974 and with some 21.000 students, played an important role in stimulating the transition to new growth areas, emphasising education and research in technical and engineering fields. While AAUs is currently shifting towards a stronger focus on global excellence and internationalisation, the long-standing problem-based learning (PBL) approaches uses joint projects that strongly connects the university to the region.

Satakunta

The Satakunta region consists of 17 municipalities with a population of 220.398 and two major regional centres, cities of Pori and Rauma. The economy relies on energy production, engineering, offshore process industry, ports and logistics and food, with automation, robotics and maritime performing well. However, annual R&D expenditure underperforms the national average, with clear GDP differences between urban centres and more remote municipalities (Regional Council of Satakunta; Satamitarri, 2018). The Regional Council of Satakunta has designed the Regional Strategic Plan, whose priorities (e.g. bio-economy, ICT and maritime environment) form the RIS3 strategy's basis. These priorities include increasing local access to higher education. The University Consortium of Pori (UC-Pori), a higher education network located in Satakunta, plays an important role in achieving that goal.

The Finnish university consortia was created to enhance HEIs' societal role and respond to local needs (FINHEEC, 2013). UC-Pori is coordinated by the former Tampere University of Technology (TUT), providing engineering degrees within the region since 1989, along with the University of Tampere (UTA), University of Turku (UTU) and Aalto University (Aalto). Today, UC-Pori has 170 employees and 2.500 students, primarily in arts/culture (Aalto), technology/engineering (TUT), social sciences (UTA) and economics/maritime studies (UTU) (UCPori).

Twente

Twente Region is situated within Overijssel Province in the Eastern Netherlands and has 650.000 residents in 14 municipalities. Having suffered industrial decline since the mid-20th century, Twente has actively sought to reindustrialise, and today, manufacturing, trade and healthcare are the main economic sectors. Several strategic bodies merged to create the 'Twente Board' in 2012 intending to drive Twente's economic development. Currently, the Twente Board (TB) is actively involved in developing the Agenda for Twente (2018-2022), a regional development strategy initiated by the municipalities. The TB involves representatives from various societal partners including two knowledge institutes: Saxion University of Applied Sciences and the University of Twente (UT). UT opened in 1964, offering degrees in mathematics, applied physics, mechanical, electronic and chemical engineering with the aim to be closely connected to the region's industrial base. Today, the university has a more diversified research and educational profile, including social sciences, and has over 10.000 students. UT has been described as being successful in repeatedly reinventing itself, and for having become a source of regional growth and innovation as a consequence of its historic collaboration with diverse stakeholders, such as policymakers and companies (Benneworth & Pinheiro, 2017). One of such areas of reinvention was entrepreneurship and innovation, cementing it as a centre of regional innovation and knowledge networks (Stam, Romme, Roso, van den Toren, & van der Starre, 2016) with a range of start-up initiatives.

Vallès Occidental

Vallès Occidental is a county located in Catalonia, the most highly industrialised and highest GDP region in Spain. It comprises 23 municipalities with approximately 900.000 people, and its main centres are Sabadell and Terrassa, the dual county capitals which overshadow the other municipalities both economically and demographically. While a predominantly textile-based region since the 19th century, today it is more diversified, with other relevant sectors including metallurgy, mechanical engineering, biochemistry, agro-food, tourism, services, IT and industry 4.0. The County Council of Vallès Occidental provides

policy and service coordination between municipalities, including cooperation for regional development, although the regional authority of Catalonia (Generalitat) retains most public policy and innovation competencies, including RIS3 and structural fund allocation. The County has promoted collective innovation support both autonomously and through RIS3-funded instruments; in these both its universities (Autonomous University of Barcelona – UAB – and the Polytechnic University of Catalonia) have played a leading role alongside other technical schools.

UAB is by far the largest and most multidisciplinary HEI in Vallès Occidental. Established in 1968, and with around 37.000 students today, it has strengthened its campus' integration with the region as an innovation support resource. UAB focuses upon the fields of social sciences and humanities, economics, bioscience, medicine and engineering, and emphasises entrepreneurship and societal engagement along with international excellence.

6.4 University institutional architecture elements in regionally engaged HEIs

6.4.1 Strategic leadership

Out of the six cases, four prioritised regional engagement in their mission statements, often with this orientation being enacted at top-management levels. Nevertheless, a lack of appropriate organisational mechanisms to anchor it in the wider academic community and effectively promote engagement was sometimes evident. Several cases presented a 'strategic mismatch', in which strategic declarations of university strategic leadership did not correspond with what actually takes place in practice. In the Pori case, academics and staff choose to autonomously (and perhaps opportunistically) collaborate with the region, despite the absence of any strong strategic push to do so from the universities (Salomaa & Charles, 2019). In both Barcelona and Aalborg, there is a strategic emphasis on regional engagement, but with a simultaneous emphasis on internationalisation, with interviewees reporting experienced tensions between these two goals. In Lincoln, there is a strong strategic goal to engage with the region, but only the vice-chancellor is providing leadership, whereas managers

and academics mainly focus on more traditional missions, i.e. teaching. In Pori, Twente and Aalborg, the primary drivers for engagement were academic and student activities (such as Aalborg's problem-based learning projects), which were promoted by institutional leaders, but not particularly effectively, being limited in their reach.

There were four regions where the universities were institutionally involved in associated platforms that sought to develop collective regional strategies for innovation, namely Aveiro, Aalborg, Twente and Barcelona. In these four regions, the universities were perceived as necessary and legitimate partners for these platforms and the strategies they developed. This was due to their access to substantial volumes of knowledge and other needed resources for the eventual successful implementation of those projects and, ultimately, the construction of innovative regional advantage. The universities enjoyed an influential position in the development of regional rhetoric, most evident in the case of Twente, where the region adopted a strategic position in 2014 that foregrounded 'technology' as the single pillar for regional development, echoing UT's desire to profile itself around its then slogan 'high tech, human touch'. In Aalborg, AAU's increased emphasis on internationalisation was undermining its capability to contribute to regional strategy processes, leading to some frustration in the regional partnership. In Lincoln, UoL was heavily dependent on the vice-chancellor as the single external representative, and although this brought visibility for the university, it places practical limits on what that engagement can achieve. In some cases, there have been efforts to create additional senior management positions to support engagement, notably Lincoln and Aveiro, although there were difficulties in ensuring that their external engagement remained coupled to institutional activity.

6.4.2 Administrative machinery

A range of different 'administrative machineries' to support engagement exists across the cases' universities, varying from top-level activities focusing on specific regional priority sectors (Aveiro, Barcelona), to more practical models indirectly guiding institutional engagement (Aalborg's PBL approach, Lincoln's European Structural Funds projects). All six universities have collaborative

activities, regional networks (Aveiro, Pori, Lincoln) and/or made efforts to win external funding for engagement activities (Barcelona). Some universities have specific administrative departments to oversee these tasks (e.g. Twente's department of Strategy and Policy, Lincoln's Research and Enterprise Team, Aveiro's Technology Transfer office, UATEC). Pori lacks a formal administrative machinery, even though the region remains important for the University Consortium there. In the absence of these institutional mechanisms to support engagement, these activities are not built on strategic/formalised routines, but more on individual academic's efforts to engage with the region. Even if the university has not formulated evident institutional strategies to encourage regional engagement, the region can still be regarded as an important partner for the university (e.g. Twente, Pori, Aalborg). In some cases, the regional funds – such as the European Regional Development Fund (ERDF) – are the key resource for delivering regional engagement activities (Lincoln, Aveiro, Pori)

One tension in all the cases was the fact that these regional funds were not regarded as relevant for universities and, in practice, they were often managed in ways that held them at a degree of distance from the core institutional setting (e.g. in Twente, Pori & Barcelona). It was not just the position of the administrative machinery that was affected by this institutional attitude to the regional funding. In most cases, regional engagement was perceived as unimportant to career development, resulting in little natural impetus within the institution to align those core activities to external engagement activities. Some universities have tried to overcome this dilemma by prioritising collaborative, large-scale initiatives that match academics and businesses to work together on regional priority sectors. Aveiro funded technical platforms in regional strategic priority areas, and Lincoln used ERDF funds to stimulate university-business interaction around innovation. Aalborg was relatively exceptional in that regard since staff members' external connections generated suitable regional projects that allowed their PBL teaching approach to function successfully.

6.4.3 Academic tribes

There were different kinds of dominant academic identities between the various case study institutions. In Lincoln and Barcelona, there were relatively traditional

academic values in which the emphasis lay on delivering teaching and research. In other cases, academic identities were more focused towards engagement (e.g. Twente, Aalborg and Aveiro), where dense connections to particular regional partners and users can be detected at the individual and departmental level. Finally, in Pori, there was much less emphasis on regional engagement at the institutional level, even where there were many academics who prioritised it as being important to their core business activities. They drew primarily on personal needs and interests rather than institutional strategies, although this undermined the capacity the university had to steer those activities institutionally. This is not to downplay the capacity that individual academics can make to regional priorities and innovation capacity; UT had a number of partnership centres that had come to Twente to work with those individuals, and likewise, there were examples of individuals leaving for better employment taking their whole research group (and in one case associated spin-off partner companies with them). Some of the universities introduced structures to empower engaged academics; Barcelona created Hub B30 and the CORE as bodies to assist these bottom-up engaged academics, whilst Lincoln created innovation voucher schemes as part of their ERDF activities to provide a direct mechanism to reward academic-innovator engagement.

Not all academics sought to be engaged or were successful in engaging through their individual networks. In Aveiro, academics were undermined by a general lack of resources which made a deviation from formally mandated activities extremely difficult to arrange. In Lincoln, the general lack of alignment between engagement and core teaching and research activities also disincentivised engagement. Pori failed to develop a persuasive narrative of its innovation activities, particularly relating to the absence of institutional or national performance indicators for engagement, in turn reducing the institutional steering of academics to engage. In all cases, academics' motivation for regional engagement was heavily dependent on their own preferences and motivations, and at least partly reflected the extent to which regional engagement was supportive of other core knowledge activities.

6.4.4 Peripheral support structures

A range of support structures was used to promote regional engagement, mostly focused around science parks and technology transfer activities. There was a split within the universities between those that tried to centralise these structures – such as Aalborg where AAU Innovation was supposed to be transformed into a single point of contact – and those that placed support activities within the academic units – as was the case for Aveiro. A key issue with these structures is that most of them did not have an explicitly regional mandate, but rather were responsible for generally promoting entrepreneurship and innovation. Although science parks represented specifically regional development assets, technology transfer and valorisation offices were primarily concerned with technology commercialisation. They did become involved in delivering specific projects related to regional engagement, often funded by European funds, and this had the result of further fragmenting and peripheralising regional engagement within the already institutionally peripheral commercialisation structures.

Five of the regions had science parks, namely Barcelona's Research Park (PRUAB), NOVI Science Park in Aalborg, Lincolnshire Innovation and Science Park, Kennispark Twente and Aveiro's Creative Science Park, providing both physical spaces but also support structures to promote regional innovation and entrepreneurship. Those parks were typically located at or near the universities, and often included shared space, such as incubators or laboratories, for shared use. Finally, no formal support structures to deliver engagement activities were identified in Pori, where key financial tools (and, critically, access to the European Structural funds), were the sole 'structure' enabling external engagement, depending heavily on individual researchers' motivations and interests. Similarly, Lincoln established many engagement mechanisms, which were primarily opportunistic responses to funding opportunities and were not managed to build and facilitate systematic interaction between regional stakeholders and academics.

6.4.5 Coupling/ co-ordinating institutions

In most cases there were no, or extremely limited, formal structures in place to link engagement to core university teaching and research activities. Individual academics were often in charge of this coupling, in turn making them responsible for identifying and applying for appropriate funding from different sources. Aveiro attempted to create an academic career evaluation system that included regional engagement, but its inefficiency ultimately discouraged and demotivated academics to report their engagement efforts. Barcelona recently formally announced the intention to factor engagement activities in academic career evaluation, but these have not yet achieved any kind of purchase within local academic communities. Although Twente made a high-level institutional claim towards supporting regional engagement, institutional incentives and internal financial mechanisms primarily reward large numbers of students and research council funding, with regional engagement only seen as legitimate when aligning with those activities.

The one region that did have formal structures was Aalborg, where even the PBL mechanism was under pressure to become internationally excellent. There was a sense that, whilst in the past regional engagement had been important to the university's academic identity, more recent changes undermined the realisation of the existential importance of that regional engagement. The region was seen as a provider of projects for the PBL approach, rather than as a partner and beneficiary of those activities. In some cases, there were examples of management to create new kinds of internal regulatory structures that rewarded engagement, primarily the industrial PhD's offered at UAB and UT.

6.5 Discussion

We are concerned in this chapter with the ways in which elements of universities' structure affect the formal capacity of their 'leadership' (as understood in Clark (1998)'s terms) to constructively contribute to regional processes. When there was an effective alignment between the regional capacities within the university structures, and the managerial leadership intentions, then this provided legitimacy for those managers in regional leadership coalitions. Conversely, when

there was a dissonance between these capacities and intentions, this undermined the capacities for managers to exert leadership in these coalitions. Constructing that legitimacy depended on there being good faith in terms of the claims made by university managers, that related to their core knowledge processes being regionally embedded. When engagement was approached more instrumentally or opportunistically by university managers, then those managers' legitimacies in the coalitions was undermined by the evident mismatch between manager claims and university regional knowledge spillovers.

In terms of the supportive factors, first, administrative machinery supported regional engagement and leadership by institutionalising senior manager intentions in various ways throughout the university. Namely in specific offices to support researchers, students and leadership in their engagement activities, as well as to try to make regional engagement viable as part of a successful academic career. This became important in terms of the presence of architectural elements that support management legitimacy in regional innovation coalitions, when existing regional activities aligned with managers' strategic intentions. Academics' networks with regional partners were important in legitimising university managers in regional innovation coalitions, and this support was strongest when the benefits that these networks were bringing to the region were congruent with the visions managers were projecting to their regional partners. Related to that, support structures played a role in helping to generalise regional engagement and upscale individuals' bilateral linkages to create regional networks, which formed the basis for managers' legitimacy claims. When this did not occur, there were the risks that key individuals' departures also saw those networks removed from the regional mix. Finally, academic activities including regional engagement in teaching and research activities also contributed to the potential to exert manager legitimacy.

The six cases also highlighted ways in which university institutional architecture can constrain the exercise of regional university leadership, most notably when there was a mismatch rather than alignment between the activities of these regional knowledge communities and strategic intentions. Some institutions had university managers who were keen to exert a strong regional leadership role, but

absent strong regional knowledge communities experienced difficulties in meaningfully shaping internal and external change. There was a lack of engaged academics in several universities, and managerial intentions alone were not enough to compensate for a lack of value to the academics in putting effort into regional engagement activities. The issue was not one of academic resistance or recalcitrance to managers, but rather a simple calculus that effective knowledge activities (teaching and research) could be created without the unnecessary effort of involving regional partners. Conversely, despite the presence of strong regional networks in some institutions, there were university managers who sought to remove themselves from regional innovation coalitions because they deemed other priorities more important. One factor that sometimes surprisingly undermined alignment and legitimacy was the presence of regional funding, because it stimulated its pursuit rather than the development of sustainable knowledge activities well aligned with the academic core.

Our analysis suggests that universities' ability to exert regional leadership requires more than the generation of spillover effects by the mere presence of the university. It requires a purposeful exercise of transformative initiatives and construction of enriching regional knowledge activities; whilst historical pathways and regional contexts do influence what can be achieved, universities can themselves influence the situation through their activities. What our analysis highlights is the importance of bottom-up leadership, constructing situations where there are meaningful knowledge spillovers through the involvement of regional partners in university knowledge communities around teaching and research. In turn, this allows university managers to mobilise a legitimacy for their activities within regional innovation coalitions and participate in collective processes that seek to improve the overall regional innovation environment. The key variable here is the alignment of the top-down management with the bottom-up engagement. Good alignment builds legitimacy that allows the exercise of leadership, whilst a lack of alignment undermines that exercise. A 'strategic mismatch' was evident in several of the cases, with managerial intention decoupled from academic community's practice; where knowledge communities were not regionally engaged then strategic leadership repertoires were not enough to stimulate these bottom-up engagement activities.

6.6 Conclusion

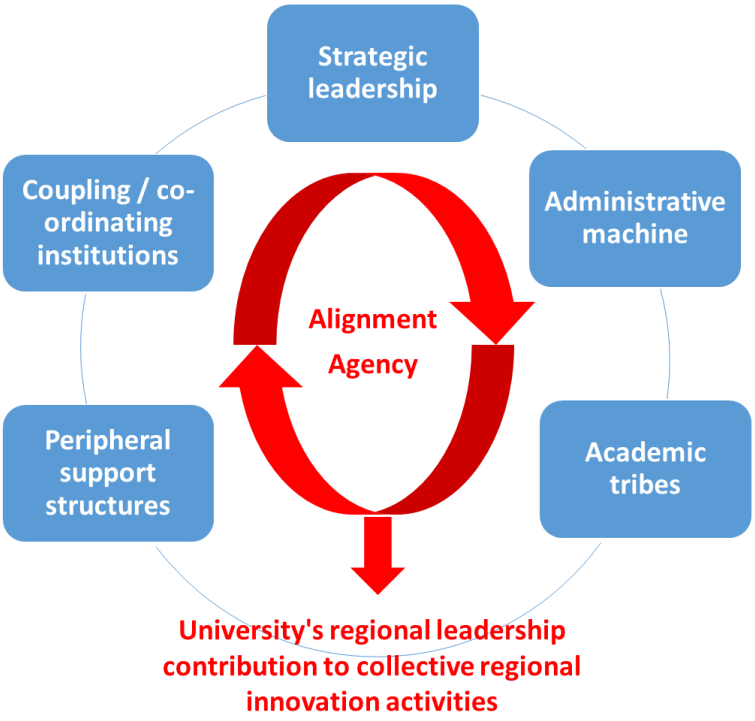
In this chapter we have sought to address the overall research question of "To what extent does universities' institutional architecture affect their regional leadership roles?". The model sketched out above provides some insights which allow us to answer this question, and in turn reflect on the consequences for research and practice. We here highlight two elements that appear most important in determining managers' capacity to exert leadership, namely alignment and agency (Figure 8). Alignment involves university managers engaging with regional innovation coalitions in ways in which their legitimacy is reinforced by their existing internal activities. But this alignment depends on those activities which are constructed by academic agents at the grassroots' level, involving regional partners in their knowledge activities and thereby creating knowledge spillovers and crossovers that deliver regional benefits.

The exercise of that academic agency is clearly influenced in profound ways by university institutional architecture, whether through the existence of formal support structures, or policies and incentives rewarding or mandating (as in the Aalborg case) regional engagement. But those architectural elements play a supporting role enabling academic agency, and that mechanism seems to be out of step regarding the institutional architecture as a means for institutional managers to impose their will upon those academic agents. Instead, alignment supports engagement through academic agents, and channels it to allow university managers to best play a wider (informal) regional leadership role.

Many agents, institutions as well as networks/coalitions of stakeholders have the potential to take on regional leadership roles (Ayres, 2014; Sotarauta, 2010; Stimson, Stough, & Salazar, 2009). Nevertheless, universities have only recently shifted into focus in place-based leadership studies (Benneworth, Pinheiro, & Karlsen, 2017; Raagmaa & Keerberg, 2017). This study thus contributes to both literature strands, linking the debates within the regional development, place-based leadership and higher education management literature by considering how universities' exertion of strategic leadership is influenced by its internal dynamics and assets, thus shaping its regional contribution. Understanding how this particular institution – the university – can contribute to regional development

in different contexts and due to different internal preconditions as well as settings thus becomes vital not only for academia, but also policy. While each university of our individual case studies showed a distinctive approach and setting for place leadership, we were able to draw some wider conclusions, taking into account their similarities and differences.

FIGURE 8. ALIGNMENT AND AGENCY AS EMERGING ELEMENTS



SOURCE: AUTHOR'S OWN ELABORATION

It is widely acknowledged that universities are complex organisations, and we see our model as reflecting that complexity, with agency and alignment allowing university managers to play these informal leadership roles. There are many factors that undermine dealing with that complexity, particularly from external regulation of higher education that demands simplistic, 'one-size-fits-all' approaches to inherently complex situations. This implies that one key area for university leaders in that regard might be protecting their academic agents from the worst of those pressures to ensure they are able to exert that regional agency,

encouraging the use of national languages in education and research, recognising applied research, allowing local guest lectures, etc. It is in this area that university managers have the opportunity to exert direct leadership, to use elements of institutional architecture to protect their academic agents and allow them to engage in their knowledge activities. In turn, that will support the exercise of this bottom-up agency by academics, generating legitimacy for university managers, and thereby enhancing the strategic regional leadership role they are able to play and optimising their university's contributions to innovation-led regional development.

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7 STAKEHOLDERS MISMATCHES AND THE ANATOMY OF REGIONAL INNOVATION COALITIONS AFFECTING REGIONAL INNOVATION PROCESSES

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Abstract

Active coalitions of regional stakeholders are at the heart of contemporary regional economic development policies, such as Smart Specialisation or Constructing Regional Advantage. These coalitions consist of actors from various organizations such as regional authorities, companies and higher education institutions that come together to achieve common agendas and advance their region. Accordingly, the numerous stakeholders are expected to work together seamlessly, build and implement strategies and thereby deliver regional development. However, by assuming that strategy formulation and implementation is straightforward, the challenges that lie within partnerships and the tensions that may arise between stakeholders can become neglected. Therefore, it is vital to understand tensions that drive towards situations in which strategy-building is not successful and 'black holes' of strategy-building emerge. By identifying the tensions between regional partners in the Twente region of the Netherlands, the aim is to understand how such stakeholder tensions affect regional development. It is assumed that by easing or resolving these tensions,

stakeholder partnerships can contribute to the successful advancement of their region. The data for this qualitative case study are drawn from both research interviews and secondary sources.

7.1 Introduction

There is a common contemporary understanding that regional innovation policies and strategies, systematic and goal-oriented activities in a regional environment, are developed and executed by a set of key regional stakeholders (OECD, 2010; Sotarauta & Beer, 2017). In this context of emergent strategy making through a bottom-up approach, the term 'regional innovation coalition' (RIC) has been introduced, describing broad-based coalitions of stakeholders from heterogeneous organisations such as regional authorities, firms and universities, who work together on the basis of shared common interests (Benneworth, 2007; Lester & Sotarauta, 2007). Diverse terms, such as regional development coalitions (Thorkildsen, Kaulio, & Ekman, 2015), interinstitutional partnerships (Silva, Teles, & Rosa Pires, 2016) and multi-level partnerships (Morgan & Nauwelaers, 2003), describe broadly similar ideas. In an ideal world, such stakeholder groups agree on a long-term vision for their region which involves various short-term exercises (Nieth & Benneworth, 2018). Accordingly, within current regional policy ideas – the most relevant example being Smart Specialisation – it is intuitively pre-supposed that stakeholders within RICs work together seamlessly, build and implement strategies and as a result promote regional development.

Nevertheless, assuming that strategy building within RICs is straightforward disregards the reality that stakeholders have varying, often even competing, regional visions and that the balancing act between shared/collective and private/individual interests can be remarkably challenging. The various classes of actors – ranging from institutions as diverse as companies and government entities to a variety of higher education institutions and R&D laboratories – that interact within regional economies are complex and compete according to specific criteria within their own 'markets'; as a result, coordinating activities between them is extremely difficult (Lagendijk & Oinas, 2005). Just as the region

is complex due to the aggregation of diverse actors, the actors themselves can be multifaceted. Therefore, the actors within a coalition are typically overwhelmed when faced with the need to formulate and implement unified regional strategies.

Factors such as the various priorities and interests of stakeholders can impair the effective and joint development of strategies. As stakeholders try to fulfil their more urgent demands (simply put: a company 'wants' to sell, a university 'wants' to publish, regional politicians 'want' less unemployment), they often fail to agree on strategic long-term priorities. Instead, the actors find easy, win-win activities that they can agree on and that are expected to bring short-term results. Sotarauta (2016) describes this as regional stakeholders falling into 'black holes' of strategy building if they accord preference to facile and interim objectives/activities, instead of focusing on inventing and executing long-term visions for their region (see Section 4.2).

In this paper the research question is formulated as "What causes regional actors to fall into 'black holes' of strategy building?". I therefore seek to understand those aspects that drive regional stakeholders to fall into strategic black holes and create a deeper understanding of the processes related to that. I use a qualitative case study – looking at the Twente Region in the Eastern Netherlands – which is based on interviews with key stakeholders and document analysis. To address the research question, I present a typology of the various factors that drive regional actors to choose suboptimal strategic outcomes. Finally, I argue that more consideration is needed for the processes that lead those drivers of strategic suboptimality to emerge. I propose that we need to develop a deeper understanding of the aspects that can reduce negative drivers, help the stakeholders to focus on long-term strategic outcomes and thus bring theories and policies forward.

7.2 Literature review

7.2.1 Regional innovation systems and regional innovation coalitions

The diverse regional actors and groups of stakeholders that interact in a region and create regional innovation strategies are part of a Regional Innovation System (RIS). The RIS approach departs from the notion that actors in the knowledge

application subsystem and the knowledge generation subsystem interact actively and thereby facilitate a constant exchange of knowledge, resources and human capital (Cooke, Gomez Uranga, & Etxebarria, 1997). While the RIS concept has been widely praised, critics claim it tends to provide a 'static snapshot of "usual suspect" actors and institutions, reducing the analysis to an inventory-like description of "the system" (Edquist, 2010; Uyarra & Flanagan, 2010, p. 683). In other words, the systematic RIS approach is criticised for presenting the current situation, without offering heuristic tools to help understand how to construct change in the region.

It is exactly here that regional partnerships come into play, providing a form of dynamism that the strategic RIS approach does not engender. One of the identifiers of regions that have been able to overcome static situations and developed capacities that create new regional futures is an active interplay and cooperation between stakeholders as a contribution to regional advancement. Often cited examples are the Emilia-Romagna region in Italy (Cooke & Morgan, 1994) and the Tampere region in Finland (Lester & Sotarauta, 2007), where stakeholders were able to build successful alliances and achieved shared objectives such as the development of a local innovation environment. Indeed, stakeholder partnerships have become increasingly central to the way that we think about regional innovation, have been responsible for the development and implementation of innovation strategies, and hence bring a form of dynamic agency into static systems (Benneworth, Pinheiro, & Karlsen, 2017).

The fact that current regional innovation theory assumes that partnerships can develop long-term strategies to drive change is acknowledged in regional innovation policies, whose success crucially depends on the cooperation within dynamic and enthusiastic RICs. For instance, the regional innovation policy model based on the idea of constructing regional advantage (CRA), launched by the EU's Directorate-General for Research and Innovation (Asheim, Boschma, & Cooke, 2006), assumes that public-private partnerships will use and apply their existing knowledge in new ways in order to create regional economic advantages (Asheim, Boschma, & Cooke, 2011). Thus, regional advantage is to be pro-actively constructed by local actors in coalitions within the existing regional

contexts. Another example is Smart Specialisation, where actors are expected to engage in entrepreneurial discovery processes, recognising and determining those sectors, technologies or overall activities which offer significant future potential for the region (Foray, David, & Hall, 2009; McCann & Ortega-Argilés, 2015).

7.2.2 Regional strategies and the risk of falling into black holes

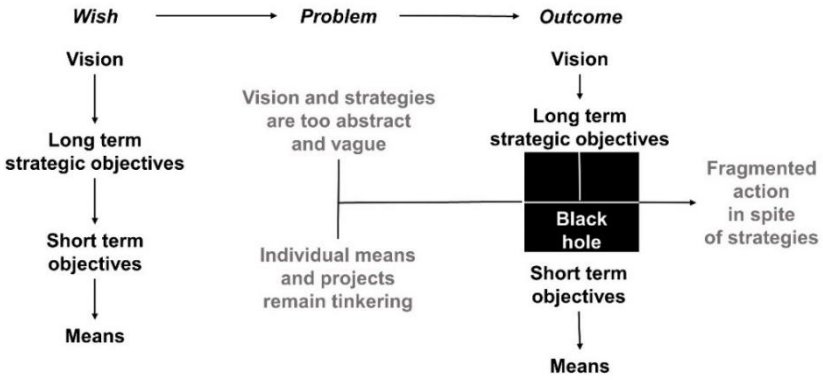
In both policy concepts, actors within RICs are expected to purposely reflect on the development potential of their region and steer regional trajectories, thereby helping the region to escape from lock-in situations or to develop novel pathways. In other words, the success of the strategies crucially depends on active transformative activities, conducted by motivated stakeholders. Nevertheless, whether regional partnerships are actually equipped to deliver what is expected and how regional stakeholders can be mobilised into action, are matters that have as yet received little consideration within policy formulation (Capello & Kroll, 2016; Sotarauta, 2018).

Coalition building and strategy formation are not as easy as assumed by the above-mentioned policies. Rather than being a bureaucratic procedure, strategies emerge from dynamic processes and discursive mechanisms, with stakeholders communicating and negotiating on priorities while trying to agree on future pathways for their region. Developing a regional innovation strategy is therefore an evolving and ever-changing process (OECD, 2009) and building consorted collective action, finding synergies, as well as creating a supportive setting for the heterogeneous stakeholders can present a major challenge (Benneworth & Pinheiro, 2017).

In line with this thought, Sotarauta (2018, p. 190) argues that Smart Specialisation Strategies are not only about 'policy formulation, implementation and evaluation but also [about] pooling scattered resources, competencies and powers to serve both shared and individual ambitions'. Thus, it is vital for RICs that a 'pooling' of knowledge and resources takes place, serving both collective but also the individual ambitions of stakeholders. To develop the capabilities of regional stakeholders, a shared learning process between the actors is required. Actors need to learn how to take joint decisions, prioritise and consolidate in order to

build effective and targeted regional innovation strategies which have the potential to contribute to the region's development and competitiveness. In an environment that is not favourable for common strategy creation, fierce competition between partners, disagreement on priorities and fragmentation might emerge and undermine otherwise constructive activities.

FIGURE 9. SIMPLIFIED ILLUSTRATION OF THE BLACK-HOLE OF CLASSICAL STRATEGY DEVELOPMENT



SOURCE: SOTARAUTA (2004)

Regional stakeholders do not all have the same levels of rationality and their visions for the future of their region may diverge reflecting their individual/institutional interests and priorities. Sotarauta's metaphorical concept of strategic 'black holes' is an attempt to articulate why regional actors fail to develop coherent long-term strategies given the emphasis on cooperation and collaboration within the contemporary 'multi-actor' and 'multi-value' world of regional development (Sotarauta, 2004, p. 14). In his vision, stakeholders may fall into black holes if the level at which they are able to agree on visions and strategies remains overly abstract and vague. This vagueness may arise as an attempt to resolve the individual aims and competing endeavours of the involved stakeholders, consequently creating strategies that are "'nice and easy to support" because they exclude almost nothing' (Sotarauta, 2016, p. 113). This failure to create a concrete common vision typically leads to an excessive and repeated focus upon short-term objectives and fragmented activities. Thus, cooperation

remains short-term and ad hoc, and does not build up towards delivering the overall vision over the long term (Figure 9).

7.2.3 Why do stakeholders fall into black holes?

Having outlined the complexity of cooperation and the risk of strategic black holes, the factors that might explain why actors fall into them will be examined in this sub-section. More particularly, I examine those aspects that might undermine the long-term and effective working of partnerships and thus lead the stakeholders to agree on suboptimal compromises.

One of the most apparent factors mentioned in the literature is the lack of competency to strategically couple the diverse actors. Although stakeholders cooperate, they fail to merge their interests successfully into a coherent long-term strategy. Yeung (2006, p. 14) explains that combining diverse interests and priorities into long-term regional strategies depends on intentional intervention, time and space. Additionally, interpersonal contacts and continuous dialogue, aspects that eventually lead to trust among stakeholders, have been highlighted as an important prerequisite for strategic partnerships to work successfully (see Gertler & Wolfe, 2004). Similarly, Pike, Rodríguez-Pose, and Tomaney (2006, p. 18) argue that 'the risks of failing to identify the correct assets [of regional strategies] are high', referring, again, to the necessary knowledge about how and when to connect which stakeholders and their respective competences.

Thus, a lack of trust between partners or missing experience in working together and coupling interests can lead to the inadvertent acceptance of suboptimal strategies with a focus on short-term goals that do not meet the strategic priorities of the region. With this in mind, another driver for strategic suboptimality can be the tendency to 'parish-pump' politics. Skelcher (2003, p. 2) explains that 'parish-pump' governance is based on the 'parochial' priorities of the close community based on 'small-minded and self-interested individuals'. When parish-pump tendencies cannot be overcome and local governance is principally focused on local interests and accountability to local constituencies (Hospers, 2014), strategic regional partnerships with a focus on a common vision barely have a chance. In the same way, short-term planning horizons based on aspects

such as election cycles or annual turnover goals can put an additional burden on strategic partnerships that aim to create a regional vision focused on long-term outcomes.

Related to the above-mentioned factors, the need for intermediaries to negotiate or possibly translate between regional stakeholders has been introduced as an important factor in finding common ground. In this sense, Wright, Clarysse, Lockett, and Knockaert (2008, p. 1208) argue that the choice of the right boundary spanner is crucial as they need to be able to communicate 'the perceptions, expectations and ideas of each to the other'. Kuhlmann (2001, p. 970) points out that intermediaries are necessary for the effective functioning of heterogeneous partnerships, not only because of their ability to facilitate the exchange of knowledge and information, but also because they can oversee '"mediated contestation" between representatives of conflicting interests'. The drivers that lead actors to fall into black holes might thus be overcome through the activity of an intermediary – possibly an institutional entrepreneur – spanning boundaries between actors that cannot agree on optimal and long-term strategies. In relation to this, Benneworth, Pinheiro, and Karlsen (2017, p. 237) argue that 'institutional entrepreneurs mobilise resources and actionable knowledge to create/transform "institutions" […] to address RIS inefficiencies'.

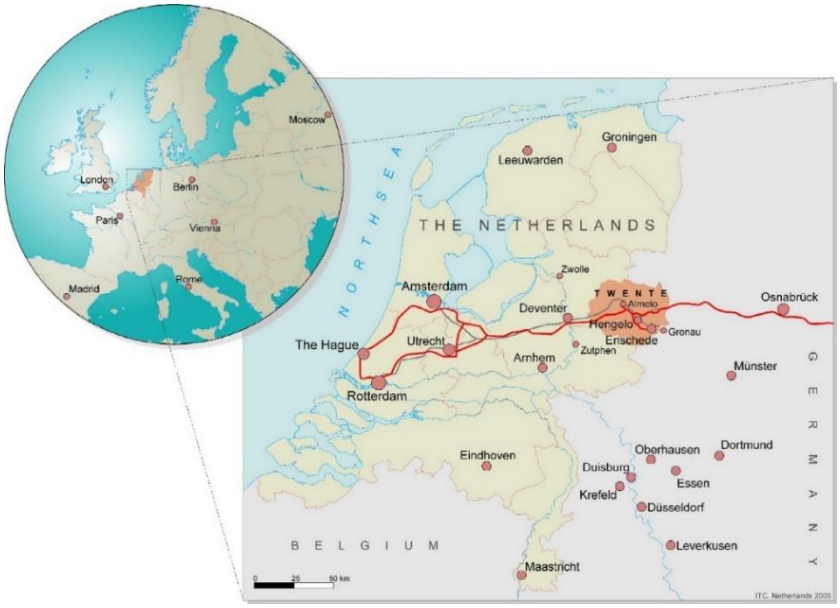
In the following section, I will therefore explore the causes of RICs falling into black holes, aiming to understand the factors that prevent the successful design and implementation of long-term strategic objectives. Delving deeper into the reasons for the appearance of strategic black holes will help us understand how we can save regional partners from falling into them and instead build long-term strategies that are based on activities conducted jointly by enthusiastic and motivated stakeholders.

7.3 Case study and methodology

Since I wish to examine which factors can cause regional stakeholders to fall into black holes, an exploratory case study design was adopted. The Twente region is an interesting case for this study, because it showcases, on the one hand, regional success stories of cooperation, and, on the other hand, tensions and struggles in

the joint design and implementation of regional strategies (see, for instance, OECD Peer Review Report of Garlick, Benneworth, Puukka, & Vaessen, 2006). I therefore intend to deduce general knowledge about difficulties between regional stakeholders that impact on strategy building and implementation in regional contexts from this case.

FIGURE 10. MAP OF TWENTE IN RELATIONTO THE NETHERLANDS



SOURCE: ITC, 2005 (COURTESY OF FACULTY ITC, UNIV. TWENTE)

The region of Twente, in the Eastern Netherlands unites 14 municipalities comprising the municipal areas around the main towns (Enschede, Hengelo and Almelo) and their rural hinterlands. Twente, being formed by its past textile industry and its quite peripheral position, accounts for about 3,6% of the Dutch population and shares a border with Germany to the East (Figure 10).

The key stakeholders in the Twente Region that are involved in the domain of regional innovation policy and in university-regional cooperation are diverse (Table 13). Although active cooperation between regional stakeholders can be found in Twente (for example, in the Twente Technology Circle and on the Twente Board), this research will focus on the diverging interests and expectations that affect the region. Specific problems that have been identified

in the past are complications: (i) between the markedly different municipalities; (ii) between competing sectors; and (iii) with respect to the roles of the local university and other HEIs (Garlick et al., 2006).

TABLE 13. KEY STAKEHOLDERS IN THE TWENTE REGION IN THE DOMAIN OF REGIONAL INNOVATION POLICY

Higher education institutions	• **University of Twente** (UT) • **Saxion University of Applied Sciences** (UAS) • **ROC Twente**: Institution for vocational education and training as well as adult education
Governmental bodies	• **City of Enschede** • **Regio Twente**: Collaborative body of all 14 municipalities • **Province of Overijssel**
Other regional agents and bodies	• **Twente Board**: A collaborative body aimed at stimulating the region's economic development, with a focus on the top sector of 'High Tech Systems & Materials' (HTSM). • **Novel-T**: A joint initiative of the UT, the City of Enschede, Regio Twente, the Province of Overijssel and Saxion UAS. The foundation mediates between educational institutions, companies and government with the aim of creating a flourishing ecosystem for innovation and entrepreneurship. • **Kennispark Twente**: This business and science park hosts around 400 companies employing more than 9 000 people as well as research and networking facilities. • **Twente Technology Circle** (TKT): A network, created in 1988 from an initiative between the UT and the local Chamber of Commerce, which connects high-tech and knowledge-intensive companies to entrepreneurs. • **Chamber of Commerce** • **World Trade Centre Twente** • **Development Agency East Netherlands**, Oost NL

SOURCE: AUTHOR'S OWN ELABORATION

This case study is based on data collected between April and May 2017 through semi-structured, open-ended interviews and the analysis of key documents. The 14 interviewees recruited (out of 20 approached) were key regional stakeholders from various institutions that are involved in regional innovation policy (Table 13). For the purpose of identifying a wide range of relevant stakeholders, a snowball-sampling technique was applied, consisting of: (i) investigation of key documents to reconstruct the roles people play in the respective institutions; and (ii) recommendations of interview partners and other specialists within the Twente Region. To actively engage with the interviewees and stimulate their memories, a narrative interview technique was adopted. Interviewees were asked

to tell 'their' story of working within the Twente Region chronologically and answer complementary questions about regional collaboration and engagement, with a particular focus on the University of Twente (UT) and its role in the region. I was one of two researchers who conducted the interviews jointly.

Additional information was taken from academic and policy literature as well as from documents that included: press releases, strategic agendas, strategic programmes and the mission statements of regional institutions. I used thematic analysis combined with a framework approach to analyse the empirical material. In other words, I created a matrix based on the central and recurring themes, thereby sorting and synthesising the data (see Bryman, 2012; Ritchie, Spencer, & O'Connor, 2003). Those main themes and sub-themes that served as 'the basis for a theoretical understanding of [the] data' (Bryman, 2012, p. 580) were identified through the help of a thorough reading of the interview transcripts and the researchers' notes.

7.4 Insights into the drivers for strategic suboptimality in Twente

In the following three sub-sections, I will present the initial findings, each describing one of the three categories of drivers for strategic suboptimality that became apparent throughout the data collection period. These drivers for strategic suboptimality seem to substantially increase the amount of work that has to be done for the coalitions to operate successfully and inhibit the development of common long-term strategies (often resulting in black hole situations). The first category, misaligned stakeholders, concerns conflicts around unclear and ambiguous roles and tasks of the diverse stakeholders. Second, the absence of the 'right' intermediaries or unattainability of the existing ones has been perceived as particularly challenging for the Twente region. Finally, a dependence on key individuals, their experience, knowledge and individual networks has been identified.

References to the interviewees' names are not disclosed because they explicitly requested anonymity. Therefore, I refer only to their functions in: (i) regional government bodies (RG); (ii) organisations within the region (for instance

companies, development agency, chamber of commerce, etc.) (RO); or (iii) university, including academia (UA) and management (UM).

7.4.1 Stakeholder misalignment

Interview partners persistently reported that actors in Twente were not suitably aligned. This reflects on the reality that although actors aimed to collaborate, personal and institutional interests within their 'own systems' were often perceived to be of higher value and consequently more important. Throughout the interviews, this discrepancy between priorities was exemplified when discussing past strategies and previous regional boards intended to develop common and streamlined goals for Twente. Accordingly, while one engaged academic (UA2) stated that the regional strategy, namely the Twente Agenda, 'confirms a regional ambition that indeed brings all the regional partners closer together', other interview partners accused the boards of not considering all relevant stakeholders, therefore leaving important actors out of the strategy-building processes. Indeed, the boards were often quite homogeneous, including the same individuals in various constellations, and a representative of the local government claimed that 'a complete base of people who all together have the same goal' (RG1) cannot be found in any strategic body operating in Twente.

Another highly relevant aspect in Twente is that the 14 municipalities are particularly diverse and therefore, the smaller or more rural ones often felt 'left out' and/or resisted ideas initiated by the more urbanised municipalities around the main towns. One interviewee from a regional knowledge transfer organisation characterised the situation in Twente as towns and municipalities 'just fighting over and over again, [asking] "Am I visible enough?"' which he claimed is a difficult initial position if one aims to 'create an ecosystem for innovation and high-tech' (RO4).

Another aspect relevant here is the fact that interviewees claimed that individual stakeholders in Twente either did not have clearly defined goals and tasks or failed to communicate those effectively to their counterparts within the region. This aspect was particularly evident around the university: while on the one hand some interviewees regarded the UT as an actor that should be focusing much

more on the region and its priorities, others thought that this would be in the interests of neither the region nor the UT, arguing that 'for universities, it is quite important to be an international main player; if you are only regional as a university, you are nothing' (UM1). One regional stakeholder felt that this made a joint projection of the region difficult since 'we are one region, the Twente region, but we do not tell the same story' (RO2).

7.4.2 Missing/unsuitable intermediaries

When talking about communication and information/knowledge exchange the second category, namely missing or unsuitable intermediary organisations, became evident. According to information provided by the interview partners, this was particularly evident in relation to interaction/exchange between the university and other regional actors, such as companies and municipalities. One regional stakeholder exclaimed that there is a 'really big wall around the university with big signs [saying] Don't enter! It's our! [sic]' (RO1), highlighting the need for intermediary bodies/individuals who can break down this wall. While many actors in Twente did not know what the mission of the UT was or what it has to offer, they were also uncertain about how to approach the university, or more particularly, its staff. One interview partner pointed out that 'People in Twente don't understand what the university is doing. They are too far away from it' (RG1). Actors within RICs need to be able to exchange knowledge and communicate successfully to accomplish high-order strategy making.

The complexity concerning the role and expectations towards the main and most widely known knowledge transfer institution, namely Novel T, was highlighted by almost all interviewees. An employee of Novel-T described Novel-T as 'not the university and not the outside, but something in between' (RO3). While on the one hand, interviewees explained that Novel-T was an important actor in bridging the various worlds and necessities of stakeholders in Twente, on the other hand, it was criticised for focusing on one specific niche of intermediary support. Indeed, it was said to focus entirely on those firms developing from within their start-up support programme and those focussing on technology entrepreneurship.

7.4.3 Dependence on individuals

The final category identified was the strong dependence on knowledgeable, experienced and well-connected individuals from the various key institutions within Twente. As stated above, interviewees claimed that such individuals continually moved within the same circles meeting each other again and again in the various constellations/boards. One interviewee from a regional organisation asserted that his networks are based on personal contacts and not on his position, recognising that 'personal networks are extremely important, which is positive, absolutely positive, but from a quality and consistency point of view, it's a risk' (RO3). Several interview partners stated that the diverse institutions failed to formalise and protocol their experience and networks, resulting in a loss of information should a person leave. A representative of the regional government highlighted that:

> *People are in place for some years, then they take another step, and they are gone. And then you see mostly [that] all the things you have built up [are] gone … there is not a knowledge system that keeps the knowledge (RG1).*

A programme manager at the UT confirmed this, stating that because of this movement of people, there is also a discontinuity of projects between partners (UM1). Accordingly, considerable effort, time and money had to be invested in continually rebuilding networks and experiences, while it presented a significant challenge to find new people who were willing to build on and reinforce what had been built by their predecessor.

Although not all the hindering factors discussed above seem to be directly linked to strategy formulation, I argue that we need to look beyond the obvious in order to understand this link: the functioning of communication, interaction and exchange of knowledge between various actors in day-to-day business is a prerequisite for them to formulate and implement strategies. RICs consist of partners that work together by pooling knowledge and resources, allow failures to be absorbed collectively and are in constant flux (as a region evolves, the partners evolve). If actors involved in such a bottom-up strategy making process fail to work with each other on general day-to-day terms, they are likely to fail in the 'the higher-order strategy making' that defines them.

7.5 Discussion

The evidence introduced in the previous sections has demonstrated that there are diverse factors that hinder regional partners from building long-term strategies. These factors have an impact on the flow of knowledge, resources and human capital, as well as on the interaction between stakeholders. Indeed, they limit or even inhibit key actors from building long-term strategies, and instead trigger the appearance of black holes. In the following sub-section, I will discuss the classes of explanations for suboptimal strategy formulation that were found.

7.5.1 Do actors fall into the black holes because stakeholders fail to align?

The point about misalignment can be seen as indicative of parish-pump attitudes in Twente. As discussed above, Skelcher (2003, p. 2) highlights that the language in strategic partnerships 'is one of leveraging resources, outcome targets and networking'. In direct contrast are the parish-pump attitudes that can be observed in Twente: the continual explanations for not being able to align show a language of justification and defensiveness. Thus, the problem is not of misalignment per se, but can be understood as a possible excuse for stakeholders to favour their own interests and priorities. By continuously blaming misalignment on their regional counterparts, stakeholders from very diverse backgrounds have shown a dismissive attitude to one another.

In that sense, the fact that tasks and missions are not clearly aligned is not the main problem because actors with differing missions could still collaborate effectively. In its place, the problem centres on the unwillingness of stakeholders to 'go an extra step' and the appearance of a kind of satisficing behaviour. In other words, the various regional partners seem to be concerned with rationalising why they cannot align and accept suboptimal/ordinary outcomes, instead of thinking about cooperation with an entrepreneurial mind-set and exerting the serious effort that is needed to transform the region.

For instance, accusing past regional boards of not being able to deliver outcomes is an easy justification for why the diverse stakeholders have not expended an extra effort on cooperation. The fact that they seem to be justifying why things

have not gone well is indicative of an ex post facto rationalisation of why actors have not worked together. In short, regional partners in Twente find it easier to rationalise why they have not worked together, than to start working together. This factor can therefore be understood in terms of misalignment. We do not know whether there really is misalignment, but the constant talk about distanced aims and actors in Twente thereby converts this argument into the justification for poor/non-transformative performance. In the end, it is the claim that misalignment is predominant in Twente that acts as a barrier and encourages regional actors to accept suboptimal outcomes such as short-term goals instead of finding new ways to align and shape the region over the long term.

7.5.2 Do actors fall into the black holes because of unsuitable intermediaries?

The argument around the absence and unsuitability of regional intermediaries can be understood as a lack of coupling experience and a lack of opportunity recognition. Despite strategic good intentions to build common and long-term strategies and connect actors, considerable experience is necessary to link them. If this experience is absent, actors end up developing short-term strategies (strategic black holes) that might not represent the strategic priorities of the region, risking a failure to identify regional competitive advantages and structural bottlenecks (Pike, Rodríguez-Pose, & Tomaney, 2006, p. 18). Since the diverse organisations in Twente (or indeed in any other region) are complex, actors or intermediary institutions who understand each other and have the experience of connecting each other are essential. Thus, when actors say they do not understand what the university is doing and how to approach it, they seem unaware that strategic coupling is a 'process [that] does not happen without active intervention and intentional action on the part of the participants' (Yeung, 2006, p. 14). This active and intentional action is not an easy process but relies on the involvement of experienced actors or intermediaries.

Another relevant aspect is that actors within the diverse institutions in Twente do not get the chance to recognise possible opportunities – possibly because they do not have experience of doing so – and therefore do not start the processes of change. There are potential change makers who could mobilise processes of

regional transformation, but they: (i) do not seem to be aware of such opportunities; and (ii) do not have the ability to take action due to a lack of experience. It seems that we are facing a problem of lack of both experience and activation, centring on the fact that the change agents/intermediaries who are needed to deliver change are not properly engaged or fail because they do not have the experience to identify the relevant strategical assets. As a consequence of this, regional actors fall into black holes, setting only short-term objectives and pursuing activities that diverge from long-term regional visions.

7.5.3 Do actors fall into the black holes due to the mobility of individuals?

As in the first two categories, this factor is not about the mobility of and dependence on individuals per se, but refers to the absence of trust in new stakeholders and the long process of dialogue and interaction that is needed to build new, trusting relationships that are the basis for all long-term strategy building. The repeatedly reported fear and challenge of losing interpersonal partners with whom connections, experience and – most significantly – trust, have been built up is thus related to the long and complex process of creating mutual understanding among new partners. Gertler and Wolfe (2004, p. 51) claim that:

> *Building trust among economic actors in a local or regional economy is a difficult process that requires a constant dialogue between the relevant parties so that interests and perceptions can be better brought into alignment.*

In this sense, when actors in Twente claim that knowledge is lost and projects are discontinued due to the mobility of people, this is related to not only having to communicate with new partners, but more particularly having to achieve mutual understanding and acceptance (Storper, 2002). In return, this difficulty leads to actors favouring the design of easy and short-term strategies within partnerships, often falling into strategic black holes along the way.

An additional aspect that needs to be considered here is that individuals seem to be required to draw on all their networks (personal, institutional and even networks from former positions), instead of only drawing on their direct links ('I

talk to who I am supposed to talk to in my position'). The development of strategies, coalitions – and to a larger extent even regions – thus depends on regional actors that are willing to build up institutional capacity over time, by having and utilising stable social networks, and by performing bridging functions between each other. Thus, in a process that is heavily dependent on entrepreneurial, active and inter-connected actors, it can be particularly damaging if such actors leave and take their knowledge and connections with them. Therefore, if a continuous shuffling of those 'change makers' is taking place, the process not only becomes unstable, but even redundant.

7.6 Conclusions

This paper has analysed the drivers of strategic suboptimality, focusing on those factors that hinder regional stakeholders from formulating and implementing long-term regional development strategies. Since the development of regions is influenced by an almost limitless set of socio-politico-economic forces (Storper, 2013), understanding such factors helps in evaluating and/or forecasting the success of coalitions and strategies, which in return affect the achievement of long-term development goals. The data presented above reveals that diverse partners within the Twente innovation system are facing cooperation hurdles and that strategy formulation does not happen seamlessly.

To help address the research question, I have developed a first typology of the various classes of reasons that might explain why actors fall into black holes. The first factor that makes actors more likely to agree on suboptimal compromises is the parish-pump problem. In short, regional stakeholders show a clear prioritisation of their own, immediate needs and interests, not being willing to compromise in pursuit of a common, regional strategy. Secondly, actors in Twente lack the experience of connecting their ideas and building common strategies. This pushes them towards more facile short-term activities that are not in line with the long-term strategies. The third category identified is related to the complexity of engendering trust when new actors come together. Due to the high mobility of stakeholders, new relationships have to be repeatedly built up. As this is a complicated and long process, stakeholders are tempted to design easy

solutions to their problems, instead of building up trust so as to help design long-term strategies.

Whether the factors identified may be particular to the Twente case or applicable more generally needs to be discovered through further research. Naturally, these dimensions need more explanation as the basis for understanding what drives these black hole problems. What we do know is that all regions face challenges and that it is vital to be aware of those before modifying policies or implementing change. We understand that regional strategies need to be rooted within the existing structures and competences of a region. Policy makers aiming to improve their regions should therefore understand the specific regional challenges and develop ways to overcome or ease those. Having developed this first typology, politicians and practitioners can better understand what is happening in a region, ease malfunctions and thereby find a 'way out' of the strategic black hole. I claim that by being aware of the challenges and minimising their existence, RICs can develop into regional bodies that have a high potential to contribute to the successful advancement of their region through long-term strategy formulation.

Current policies and strategies tend to focus on 'just' the shared ambitions, while not giving enough attention to the interaction of individual ambitions. Therefore the 'pooling' of ambitions needs to be considered in more detail throughout this process. Additionally, there is a relatively weak treatment of individual and collective actorhood in regional strategies. The idea that individual change agents and coalitions of those agents are going to drive the region forward is implicit within CRA and Smart Specialisation, but what we see is that the individual change agents and coalitions face tensions that inhibit them from exerting that change agency. Hence, they do not deliver what is expected. The ways that Benneworth, Pinheiro, and Karlsen (2017) and Sotarauta (2016) have used institutional entrepreneurship as well as inter-institutional and 'soft' regional leadership might be first steps to further develop these points.

This study will thus have implications for both theory and practice. It suggests that, specifically in policy formulation, we need to enhance the understanding regional actors have of each other's differences. Furthermore, we need to learn how to identify, empower and mobilise change agents. Having a better

understanding of the change agents that are available within a region, we can make recommendations about which problem-solvers should be 'sitting together on one table' in order to develop and implement the 'right' strategy. The findings also suggest that policy designed to encourage regional engagement and strategy building needs to consider possible drivers for strategic suboptimality and find ways to reduce the occurrence of those.

The conceptual contribution of this paper is first, the identification of this lacuna in the literature and second, filling this gap by recognising and categorising the reasons for the frequent failure of regional innovation coalitions. The analysis has shown that although actors are willing to develop common and long-term strategies, there are factors that lead them towards falling into black holes of strategy formulation and implementation. Therefore, what has been described as an ordinary process (coalition building and strategy formulation) in policy agendas such as Smart Specialisation and CRA, is very complex. Indeed, what has tended to be dealt with as an everyday, additive, bureaucratic process is in reality a constructive, creative, innovative, uncertain and transformative process, and the actors included in the definition and implementation of it have been under-researched. We therefore need to better consider those actors, their willingness, seriousness and commitment to their region and we need further develop our understanding of the factors that lead towards strategic black holes.

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8 CHALLENGES OF KNOWLEDGE COMBINATION AFFECTING STRATEGIC REGIONAL INNOVATION PROCESSES BETWEEN COMPLEX PARTNERS

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Abstract

This paper considers how heterogeneous groups of regional stakeholders design and implement strategic activities that contribute to their region's innovation capacity. We aim to understand how these stakeholder groups attempt to create new regional development pathways, and explore why otherwise enthusiastic and willing partnerships might fail to progress. We conceptualise this in terms of partners seeking to develop a shared actionable knowledge set as the basis for future development, and contend that one explanation for these failures might be a failure of the ways that partners combine their knowledge. We conceptualise strategic processes in terms of a series of distinct phases, and identify how problems in knowledge combination processes might manifest themselves in preventing the creation of valuable knowledge for subsequent action. Drawing on a detailed empirical case study of the Creative Science Park in Aveiro (Portugal), we argue that a better understanding of inter-stakeholder knowledge combination processes is necessary for creating and implementing better

strategic transformational development processes for regions.

8.1 Introduction and problem setting

The creation of strategic regional innovation processes is an almost ubiquitous development/topic in contemporary economies (OECD, 2011) and much supporting work has been undertaken on identifying "ideal type" approaches. Strategic processes involve regional partners arranging themselves towards purposive regional interventions that affect the overall regional development trajectory, and ideally upgrade the regional economy. The collective nature of these strategic processes imply that they should be more successful when more regional stakeholders are more substantively involved (Navarro, Valdaliso, Aranguren, & Magro, 2014). Regional strategic processes represent ongoing agreements between participants to work towards achieving common directions of travel and to jointly invest in and deliver work packages towards intermediate objectives that can be realised through collaboration (Valdaliso & Wilson, 2015). These regional strategic processes thereby result in regional change, and subject to the correct diagnosis being made, can help to build new regional development pathways that ultimately lead to more prosperous regions.

Despite extensive work on regional innovation strategies, Aranguren, Navarro, and Wilson (2015) note that the activity of "strategy-making, in general, is a black box that needs opening up" (p. 219). Theorisation to date has been primarily preoccupied with describing the qualities of good strategies and setting out ideal type processes by which good strategies can be collectively/collaboratively created. This downplays the role of individual agency (Uyarra, Flanagan, Magro, Wilson, & Sotarauta, 2017) in favour of collective narratives (sometimes referred to as "happy family stories" (Lagendijk & Oinas, 2005)). Those "happy family stories" can in turn be critiqued for failing to examine how heterogeneous groups of regional actors with diverse interests can overcome internal tensions and to agree and collectively fund joint action that deliver solutions intended to bring long-term benefits.

In this paper, we explore these tensions looking at the dynamics of actors in

terms of goal setting and realisation within strategic processes of regional innovation. Sotarauta (2016) identified that problems emerge in implementing prospective agreements where regional partners can easily agree on long-term goals in principle, and then initial actions, but fail to continue to take the subsequent steps to deliver these desired long-term effects towards a wider locus of regional change. This paper is concerned with how successive short-term interventions may converge towards long-term strategic objectives, and how participants' different interests affect these convergence processes. We ask the overarching research question of "*How can "actors within regional innovation collectives" develop strategic regional innovation processes to improve longer-term regional economic performances?*".

In section 2, we present a framework explaining how actors collectively attempt to envisage and realise mutually beneficial outcomes in strategic regional innovation processes, highlighting the importance of knowledge combination processes in determining progress. We explore this framework using a single case study, based in the Aveiro region in Portugal, where a regional innovation collective experienced ongoing hindrance in the realisation of its goals despite an apparent high level of consensus and enthusiasm for the regional innovation system. We highlight a number of problems in knowledge combination processes that arose early on in developing the science park, not hindering immediate process, but creating fissures that were problematic later. We conclude by arguing on the basis of this exploratory case study that this conceptualisation appears useful for exploring regional innovation strategies. A better understanding of inter-stakeholder knowledge combination processes (reflecting different regional economic development contexts) is necessary for creating and implementing strategic transformational regional development processes.

8.2 Developing binding action frameworks to shape an uncertain future: a knowledge combination approach

To address this question, we propose a framework to understand how regional partners are coordinated into shared actions and ultimately improve longer-term regional economic performances. That coordination function is provided by

strategic processes, processes where regional stakeholders are mobilised, their needs and opportunities articulated and arranged into a strategic plan, which is subsequently implemented. The overall coordination to longer-term regional changes comes through successive rounds of strategic processes in which partners attune to successes and failures between successive policy rounds. We regard coordination problems as a failure to successfully attune ongoing strategic processes, thereby failing to deliver this longer-term economic change.

8.2.1 The role of regional innovation coalitions in delivering strategic innovation processes

There has been growing scholarly and policy interest in understanding how regional policies affect innovation thereby promoting societal welfare and development (see for instance Borrás & Jordana, 2016). The reason for the focus on the region as a scale of analysis and implementation is because regions are the spaces within which various kinds of proximity can facilitate tacit knowledge exchange between partners, creating wider regional spill-over effects (Boschma, 2005; Maskell & Malmberg, 1999). Within this, some regions suffer from a set of problems that systematically inhibit territorial innovation, and modern innovation policy has emerged as an attempt to focus on equipping all regions to benefit from innovation by addressing these problems where appropriate (Benneworth, 2018; OECD, 2011; Rodríguez-Pose, 2013; Tödtling & Trippl, 2005).

This emphasis on equipping regions to address these problems is evident in the theories underpinning modern regional innovation policy such as Smart Specialisation or Constructed Regional Advantage (McCann & Ortega-Argilés, 2013). These approaches emphasise the identification and implementation of case-specific regional solutions through strategic processes involving diverse stakeholders (Nieth et al., 2018) that are able to take into account the oft neglected subtle interdependencies between actors (Pinto & Rodrigues, 2010). These activities seek to deliver a series of changes that successively add up towards improvements in long-run regional economic performance. In the case of less successful regions that could involve what Cooke (1995) refers to as an

upward shifting of the "economic development road".

We here foreground the idea of strategic processes as being central to the activation of agency within regional innovation policy to produce these upward shifts in regional economic performance. These strategic processes involve regional stakeholders coming together into what Benneworth (2007) calls Regional Innovation Coalitions (RICs). RICs consult external experts and identifying the region's current situation, strengths and opportunities, work creatively to identify regional weaknesses and propose policy interventions to strengthen existing regional assets (Boekholt, Arnold, & Tsipouri, 1998). Strategic processes have two functions within regional innovation policy: (a) they set out a pathway to a clearly desirable collective future state, and (b) they identify activities and interventions necessary to realise that desirable future. They are delivered within multi-actor and multi-level governance systems, are dependent on the past development of the region and involve a set of complex stakeholders with different capabilities and interests (Laasonen & Kolehmainen, 2017; Uyarra et al., 2017).

Given this complexity there is a need to consider in detail the way that actors' behaviours in these coalitions lead to overall changes in the regional innovation environment (Benneworth, Pinheiro, & Karlsen, 2017; Hassink, Isaksen, & Trippl, 2019; Sotarauta, 2018). Activated agency approaches note that stakeholder groups working together to address regional challenges can compensate for the fact that any single organization may lack sufficient capabilities to develop and implement regional solutions (Arenas, Sanchez, & Murphy, 2013). Different agents with complementary elements of what Coffano and Foray (2014) call "entrepreneurial knowledge" work together on these processes, combining their individual knowledge sets to envision collective regional futures (van Tulder, Seitanidi, Crane, & Brammer, 2016).

Successful strategic processes involve creating, exchanging, managing and applying "different forms of popular and expert knowledge" (Oliveira & Hersperger, 2018, p. 1). Their success therefore depends upon partners collective capacities to combine knowledge from "different sources, geographical scales

and channels" (Grillitisch & Trippl, 2014, p. 2306). Strategic activities are therefore not only processes of sharing knowledge, but creating new knowledge in processes that demand bargaining and compromising between different agents (Aranguren, Navarro, & Wilson, 2015). But combining different kinds of knowledge within networks is not a straightforward process, and itself represents an innovation process (Asheim & Coenen, 2005). The nature of the knowledge changes in its combination and circulation between partners in pursuit of these collective goals. Partners seek to create through these combination processes what Aranguren and Larrea (2011) call "actionable knowledge", that provides the basis for activity and progression towards the longer-term goals of regional improvement. We follow the definition of (Argyris, 1996) understanding "actionable knowledge" as that knowledge that is required to implement external validity (relevance) and is thereby necessary to transform abstract knowledge into an everyday world context.

A shared set of regional goals must be formulated in ways that require different partners to contribute their implicit understandings of the region in ways that other partners understand and accept it. Partners must therefore first codify their internal tacit knowledge, then bring it together with others' codified tacit knowledge, and combine it into a codified text (shared goals). Those goals must then be pursued by partners implementing individual innovation projects – those partners must firstly acquire that codified knowledge, and make sense of it to apply it to their own project to ensure it meets partners' intentions. These switches between codified/tacit knowledge and internal/external knowledge change the nature of that knowledge and are not trivial processes (Nonaka, 1994; Nonaka & Takeuchi, 1995). This is complicated as creating futures is an unknowable and complex process. Participants' willingness to make these efforts, notably to transfer private, tacit knowledge into the collective domain depends on those collective results' value given their individual interests (Benneworth, Hospers, Jongbloed, Leiyste, & Zomer, 2011). And it is this issue of the calibration of individual interests within these collectivities that we contend has to date been missing from considerations of these strategic processes as they move from present uncertainty to future positive outcome.

8.2.2 RICs building actionable knowledge that delivers innovation outcomes

The purpose of the knowledge combination is to create actionable knowledge to proceed from present uncertainty to future positive outcome. We conceptualise this following Clarke and Fuller (2010)'s "integrated conceptual model for collaborative strategic planning and implementation" (p. 86) as a progression between four qualitatively different states of strategic action, namely mobilisation, articulation, strategic programming and realisation. In this stylisation, strategic processes see RICs combine knowledges to build actionable knowledge assisting progress between these four different states towards realising desirable futures (see Figure 11). We actively modify the framework of Clark and Fuller – which is a linear pipeline – following Aranguren and Larrea (2011) who stress path-dependency. We do that because of the nature of the object of study – a region rather not a single, easy-to-control business. Thus we regard progress through the different states as a constructive struggle, where what can or cannot be achieved in one state affects how it does or does not progress to the next.

The first state, **mobilisation**, involves developing a collective understanding between partners to function as an effective RIC. Partners bring a range of capacities to the coalition and – by signalling these capacities to others – a collective reflection on how capacities could potentially be applied to regional problems is developed. The RICs also begin identifying potential desirable future states, without necessarily specifying one particular choice. In this state, partners may opt in and out depending on relationships with the full coalition, and the potential desirability of the emerging regional future (Brinkerhoff, 2002).

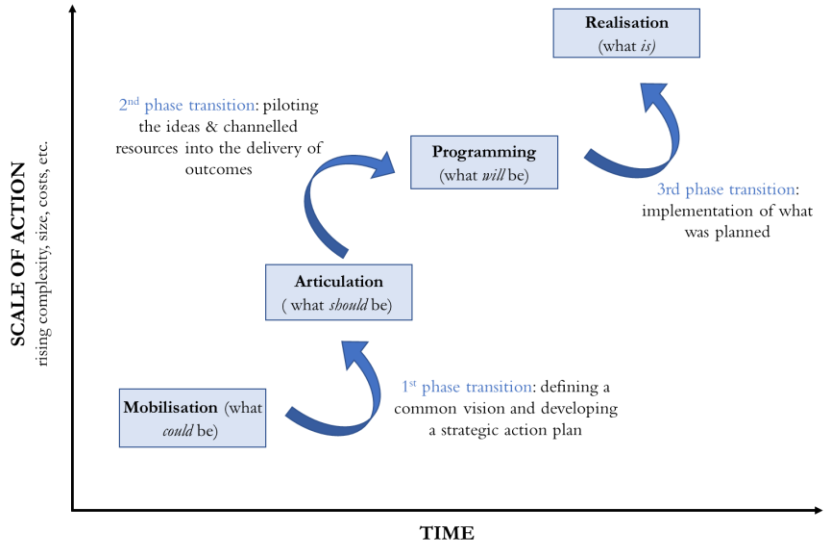
The second state, **articulation**, is characterised by regional partners agreeing on an overall common vision, and the willingness to develop a collective plan to deliver that vision. This typically involves a discursive mechanism for negotiating priorities and potential regional futures, optimising between individual interests/capacities and regional interest/need. Success here requires generating synergies and aligning diverse partners' different needs and priorities. The time needed to achieve this prioritisation varies depending on "the nature and extent"

of the issues requiring agreement, and is not amenable to bureaucratic timetables (Clarke & Fuller, 2010, p. 88).

In the third state, **strategic programming**, partners agree on clear operational plans for delivering high-level strategic visions. Partners in this state build certainty regarding the concrete activities to be delivered, and reach agreements on how different partners will combine their capacities to deliver added value and regional transformation. Strategic programming involves partners taking concrete decisions about what they will pursue and to make choices about how those activities will be delivered, reflecting individual interests and capacities along with the overall agreed regional goals.

The final state, **realisation**, is concerned with implementing planned activities, with partners combining their knowledge to ensure that what has been planned for can be delivered in practice. Individual activities here may focus upon appropriating extant collective knowledge and interpretation, and execution creating novel interventions whilst dealing with arising uncertainties. Individual partners here face the challenge of ensuring projects are not just successful in their own terms, but remained coupled with the wider regional strategic goals.

FIGURE 11. FOUR-STATE PROCESS OF STRATEGY FORMULATION AND IMPLEMENTATION IN RICS



SOURCE: AUTHOR'S OWN DESIGN BASED ON CLARKE AND FULLER (2010)

8.2.3 Knowledge combination failures as barriers to RIC success

Our modified Clarke & Fuller model describes progress by partners effectively combining knowledges to create actionable knowledge that enable those future actions that move towards the delivery of the strategic goals. We here draw upon Nonaka and Takeuchi (1995)'s knowledge combination model which covers four processes: socialisation, externalisation, combination and internalisation. We observe that there are two important dimensions in this model, a distinction between tacit and codified knowledge and between internal and external knowledge. It is these two dimensions that are most useful for us in understanding knowledge combinations in RICs. We argue that in RICs – trying to create an actionable collective knowledge base (and not just being concerned with internal knowledge) – there are three key knowledge combination processes: There is the internal curation of knowledge to contribute to strategic processes, combining internal tacit and codified capacities to produce knowledges that are placed into the collective sphere of the RIC. There is an external knowledge

combination process in which RIC actors take these various inputs and seek to combine them into a shared knowledge capacity oriented towards improving long-term regional economic performance. There is then an actioning process where elements of the external knowledge are acquired by individual partners and absorbed to be transformed into a local actionable knowledge base.

Framing strategic processes as knowledge combination and transformation processes allows us to propose conditions under which RICs may fail to deliver regional transformation through being unable to effectively combine partners' knowledge. In earlier phases, openness for discussion, compromise and cooperation of the different stakeholders is required to overcome emerging disagreements (Arenas, Sanchez, & Murphy, 2013). Later, openness ensures that particular activities' execution and implementation remain aligned with the overall regional direction of travel. The success or failure of knowledge combination also depends on both the acceptability and reality of the emerging knowledge to the stakeholders, and whether an acceptable and realistic future can be agreed given diverse partners' individual interests. The critical issue is the state transition, and the transformation of knowledge that takes place. We identify in Table 14 below those problems that potentially arise within each state and hinder progression to the next state.

TABLE 14. KNOWLEDGE COMBINATION PROCESSES AND BARRIERS THROUGH STRATEGIC PLANNING AND IMPLEMENTATION

	Progress	**Curation**	**Combination**	**Actioning**
Mobilisation	Producing a set of possible consensus points for an attractive innovative future	A failure to articulate in neutral language organisational capacities related to creating new potential regional futures	A failure to identify external partners with complementary capacities to create new regional futures	A failure to develop a diagnosis including the potential of those bundled complementary capacities in creating new regional futures

Articulation	Agreeing which of the consensus points should be chosen (including pointing to pilots as evidence)	A failure to identify which elements of the collective knowledge correspond with internal institutional priorities	A failure to construct a coherent collective knowledge base regarding necessary future actions, leaving a "washing list" of possibilities	"Cherry picking" desirable elements of the overall regional innovation concept that do not necessarily function suitably in isolation
Programming	Committing resources to be spent on activities that will take a step towards the brighter future	Producing plans that exclusively serve the individual institutional interest, correspond to one element of collective knowledge lacking wider complementarity	A failure to integrate the individual institutional capacities into programme that adds value to the sum of the parts	A failure to identify the ways in which that individual institutional projects can contribute to stimulating collective/regional spillovers
Realisation	Using delivered "infrastructure" to expand the range of possible innovative futures as the basis for new cycles	A failure to articulate how the developed infrastructure and capacities could complement with other actors to create regional spillovers, specialisations and knowledge pools	A failure to revisit understandings of regional strengths on the basis of capacities created during a programming period	A failure to learn from the ongoing external experiments to modify internal behaviour and drive new internal learning processes creating internal capacities

SOURCE: AUTHOR'S OWN DESIGN BASED ON FIGURE 11

8.3 Methodology and introduction to case studies

8.3.1 Methodology

We use this framework to create an understanding of how RIC actors participate in knowledge combination activities creating actionable knowledge that influences longer-term regional economic performance. We adopt a qualitative exploratory approach, taking a single case study allowing sufficient analytic detail to give insights into whether the dynamics suggested in our framework are indeed evident. We explore a slow-moving strategic process to examine whether knowledge combination problems within these different states explain slow strategic processes. We use qualitative data to produce a synthetic narrative of

strategic processes, which we then stylise using our concepts and compare with the proposed theoretical framework.

Fieldwork was conducted between January and August 2018. Primary data were collected through 45 qualitative semi-structured interviews – each lasting between 45 and 75 minutes. Interview partners were identified through informative conversations with relevant stakeholders of the RICs whereafter a snowballing approach was applied. The interviews focused upon asking participants to describe in their own words their collaborative efforts around the regional innovation strategy leading to the creation of a particular intervention (the Creative Science Park, see next section). Interviewees were asked to describe how regional partners collaborated in strategic processes, their own roles and their interactions with other actors. Interviews were anonymous and confidential, recorded and transcribed, and data analysis supported by the use of Atlas.ti software. The primary data was triangulated against secondary documents and archival records of interest, which covered reports produced as part of strategic planning, official collaboration agreements, strategic collaborative plans, newspaper articles and website content.

8.3.2 Case study region of Aveiro and introduction to the RICs

The chosen study region of Aveiro comprises 11 municipalities combined in the intermunicipal community of CIRA (Comunidade Intermunicipal da Região de Aveiro), situated in north-central Portugal. Aveiro is a small region in northern Portugal, with 370,000 inhabitants concentrated in a number of medium-sized cities (Aveiro, Águeda and Ovar). Although the region is sometimes described as peripheral/less favoured in the European context, it is a rather strong industrial region in the Portuguese context. It is home to several internationally leading firms with strongly emerging sectors such as the metallurgical, chemical, food, automobile, non-metallic minerals and electrical equipment industry (Rodrigues & Teles, 2017). Aveiro was chosen because as a Portuguese region, it had benefited from considerable investments in science and technology infrastructure since the early 1990s. Despite a desire dating back to 2000 amongst regional partners to create a science park – with serious discussions beginning in

2007 – the science park was only realised and formally opened in 2018; This offers a prima facie case of a non-straightforward (regional innovation) strategy process. The RIC was constituted around a stakeholder and shareholder group formed to deliver Aveiro's Creative Science Park (CSP), involving five types of partners:

- scientific partners: Aveiro University (UA);
- local government: Intermunicipal Community of the Region of Aveiro (CIRA), Municipalities of Aveiro and Ílhavo;
- institutional partners: Industrial Association of Aveiro (AIDA), Inova Ria (Companies Association), Young Entrepreneurs Association, Administration of the Port of Aveiro and Portus Park;
- financial partners: Caixa Geral de Depósitos and Banco Espírito Santo; and
- companies: PT Inovação, Martifer, Visabeira, Civilria, Durit, Exporlux, Ramalhos, and Rosas Construtores.

The region is set in a cultural and historical context where the style of collaboration is highly dependent on personal interrelations as well as hierarchy and power distances (Kickert, 2011). It is important to note that strategic leadership in development processes – such as the one analysed in this paper – is often split between partners with no clear order, all claiming to know their region best and participating in what Sotarauta and Mustikkamäki (2012) have termed the "strategic leadership relay for regional development" (p. 338) (see also Beer and Clower (2014) for a more detailed treatment). The University of Aveiro and the intermunicipal community (CIRA) found themselves at the centre of this collaborative leadership, with the core leadership role evolving over time from the university towards CIRA.

The CSP represents a continuation of an ongoing cooperation between UA, regional municipalities and industrial associations such as AIDA. The CSP sought "to be a strategic and operational promoter of innovative and entrepreneurial projects" in five strategic areas, in line with UA's strategic areas of information technologies, communication and electronics; materials; marine

economy; agroindustry; and energy (Universidad de Aveiro, 2015, p. 75). Part of the structure of the case is a powerful core group of leaders, representing the university and the municipalities who are powerful within CIRA. There is then a wider stakeholder network that does not actively exert leadership, nevertheless there have historically been struggles between and disagreements around strategic regional priorities, often decided on by these two core groups. Occupying a 35ha site, three buildings opened in March 2018 housing the Business Incubator of UA, the UA Design Factory and the Laboratory for Common Use of Information Technology, Communication and Electronics (Georgieva, 2018). Of the total €35m investment – provided from all the shareholders and co-financed by the Portuguese National Strategic Reference Framework (QREN) – €20m have been spent to date. The second phase of construction, creating additional space for new companies, was still without a scheduled start date in early 2018.

8.4 Ten years in the making: the long road to the creative science park of Aveiro

The realisation of the science park was a ten-year process characterised by moments of rapid progress alongside periods of indecision and stasis. In this section, we present a stylised historical overview of the strategy process. The stylisation involves highlighting process elements where actors sought to create collective understandings as the basis for action, although we hesitate in this section from seeking to immediately ascribe events to a particular state according to the theoretical framework. In section 5, we apply our conceptual framework to this historical overview to analyse the dynamics of knowledge combination processes and inform our concluding discussion.

8.4.1 Preceding connections and the big idea of building something together

One of the earliest activities between RIC participants – UA and the respective municipalities – related to the Aveiro lagoon, affected in the late 1980s by pollution and environmental challenges. To save the lagoon, the municipalities

decided to design a common environmental policy that would also involve the UA as it was located near to the wetlands and had potentially useful knowledge on addressing those challenges. Various joint undertakings were subsequently developed, exemplified by the multi-party creation and implementation of territorial development plans for 2007-2013 and 2014-2020 to receive and manage a National Strategic Reference Framework grant (see detailed analysis in Rodrigues & Teles, 2017; Silva, Teles, & Rosa Pires, 2016).

These different joint activities – hoping not just to facilitate the knowledge economy but collectively building an element of the knowledge economy – led to the idea of creating "something ambitious" between UA and CIRA. At this time, as a senior official related, regional partners agreed with the collective goal of creating "the most important example of cooperation between the region and the university". The idea initially related to creating an industrial zone, and a feasibility study was undertaken, and in the course of those discussions, the common idea emerged of the desirability and feasibility of creating a "science park".

8.4.2 Choosing a concept: fact-finding missions & the Tampere model

The idea of creating a science park began to seriously coalesce in late 2007 and – according to an academic close to the CSP process – was driven by the university "trying to spot an opportunity" and starting the discussions with key entrepreneurs and municipalities. The choice of creating a science park was defined as an alternative to developing an industrial area or a real estate park. That choice can be traced back to the fact that municipalities were strongly interested in attracting new firms to their municipalities as an economic development strategy. They were worried of the potential for a science park to lure companies away from their industrial zones (thereby lowering resultant municipality business tax bases). The idea of the CSP as an alternative facilitated its choice precisely because it would not create competition with municipalities' industrial zones.

As participants became enthusiastic about creating some type of science park, different concepts were explored with the intention to deliver a consensus about

what kind of science park was suitable for Aveiro. UA was keen to ensure that the new science park fitted with strategic priority areas for regional innovation in the regional development strategy, and took an active lead at this point. Firstly, UA arranged a scoping study for possible contemporary science parks, followed by a series of field visits to science parks around Europe (Denmark, Sweden, Spain, Finland), along with regular meetings between and discussions amongst the regional stakeholders. The field visits were arranged with the help of UA employees drawing on their extensive international institutional networks to identify suitable site visits. The final decision on the Aveiro Science Park model was taken jointly between the university rector and the CIRA president – and they justified their choice with reference to the scoping study and field visits.

The model of the "creative science park" was chosen in the course of 2008 and 2009. A local government employee argued that the main aim of the CSP was to "grow the connections between the companies and the university and [to create …] a positive environment with innovation". At the same time, it was intended to be "closer to firms than the traditional science and technology park". The university employees defined the most suitable science park model drawing heavily on the science park visited in Tampere, Finland, although as one interviewee from UA noted "what they [the non-UA study trip participants] saw were buildings and not so much these institutional bases, which is much more important than the building". Although UA did not share that understanding, the idea consolidated (possibly not consciously) amongst other partners that the CSP was primarily a real estate project rather than a focus for business support networks (the institutional bases alluded to in the previous quotation).

8.4.3 The difficulties of choosing locations & changes within the UA team

Once the decision was taken to create a CSP, the focus of stakeholder discussions shifted to determining its precise location. Although the science park model was chosen over an industrial park model, the emphasis on creating a set of buildings reawakened municipalities' latent fears (critically amongst mayors) that the CSP would still lure businesses away from other municipalities. Mayors began actively

competing with each other to win the CSP in the hope of attracting the businesses that the CSP was expected to bring.

UA is located at the border of Aveiro municipality, adjacent to Ílhavo municipality, and Ílhavo municipality was eventually chosen to host the CSP. Interviewees identified two main explanations for this decision: Firstly, because strong political interests ruled out other locations, and secondly, that the CSP could be created adjacent to UA allowing UA to expand into a new municipality whilst also allowing the CSP to benefit from proximity to UA infrastructure. The location decision was primarily political, driven by a desire amongst politicians "to show the people [their potential voters] that they are doing projects and building, building, building while not thinking in strategic terms – in the long term". As part of this compromise, CIRA and UA promised to develop a study outlining how and why the CSP would benefit all municipalities (although this study never materialised). Interviewees also argued that the CSP location provided an expansion opportunity for UA in a neighbouring municipality, although there did not appear to be a significant potential for further student growth in UA.

Location competition also became controversial within the UA at various levels, particularly between the Department of Social, Political and Territorial Sciences (who were involved in the planning processes) and the Rectory team (initially with a clear institutional interest in expanding the Aveiro site). This internal disagreement covered a range of issues, from the location, and indeed whether the university should properly be involved in the science park; These disagreements led to some UA participants progressively withdrawing from the project. In 2010, rectorship elections led to an unexpected change in UA leadership, and the new leadership demanded changes to the science park model, focus and expected tasks. These changes demanded reopening discussions with partners and integrating new people into project structures which significantly slowed the development.

8.4.4 Planning regulations and public protests

The advancement of the CSP was then subsequently further delayed due to

complications with land acquisition and the changes to planning regulations necessary for building the CSP. The disagreements within the RIC had seen land acquisition proceeding in a piecemeal way. This later hindered the development of the physical infrastructure linking the university and CSP: bridges, pathways and streets all had to cross land still in private ownership. These additional delays led individuals from other municipalities to publically criticise the project, claiming those problems demonstrated that the location choice was incorrect.

An additional complication came because the CSP zone lay within the Aveiro lagoon zone, land with substantial ecological and agricultural value. ONG Quercus, "one of the most important private environmental agencies in Portugal" actively protested against creating the CSP in the chosen area, mobilising local political parties against the project. These protests escalated into 13 different court cases (PÚBLICO, 2015; Santana, 2014). A number of interview partners noted that the CSP plans would preserve much of the land, create an observatory tower over the lagoon and be publicly accessible as both a research and knowledge centre, but also for recreational usage. After the CSP won the first court cases, the legal examination of the other cases was stayed, although the litigation compounded project delays.

8.4.5 Opening of the creative science park

These delays compounded substantially: one high-level government employee observed: "When we started, we thought that we would put it out in six years [...], but we have many, many problems, difficult problems. And we took twice the time that we thought at the start". A company representative described this significant delay in opening as particularly complicated for companies involved whose business plans depended on the timely availability of suitable accommodation.

Having finally overcome the delays and complications, the CSP was officially inaugurated in March 2018, shortly before the UA rector's mandate expired. The other municipalities had found themselves disengaging with the process as the difficulties of persuading residents of other municipalities that the CSP was also beneficial for the more distant parts of the region became clear. Although the

CSP building was largely empty at its opening ceremony, the first three buildings were operational at the time of writing, hosting 80 organisations with 400 employees, including the UA Business Incubator, the Design Factory & diverse shared use laboratories (Universidad de Aveiro, 2019).

8.5 Knowledge combination problems across the four phases

We now use this stylised history to analyse the CSP as a case of strategy-making through knowledge combination processes, exploring how those processes unfolded and which factors influenced them. We stylise the case into four distinct phases corresponding with the conceptual model's four states (we here term them phases to avoid a simple reading-off onto the model). In the first phase, UA provided important knowledge framing the science park notion and allowing sceptical municipalities to agree upon the desirability of creating some kind of science park. While both of the two main stakeholders (UA and CIRA) were jointly active in these initial developments and the ideation process, it was the university that was taking the lead in the first phases.

In the second phase, UA oversaw a process to concretise a selection by municipalities, leading to the "Tampere model" (as the centre of dense innovation networks) being chosen. In the third phase, a failure to achieve consensus manifested itself in a shift in project leadership towards leading municipalities, who imposed their reading on the CSP meaning (an attractive location for tax-paying businesses). This can be seen as the only, but very relevant shift in the balance of power throughout the complete process. In the final phase, the lack of a common position hindered sensible decision-making and saw lengthy delays in the development which – with the benefit of hindsight – were largely avoidable. We now characterise the nature of the knowledge combination processes in each phase.

The **mobilisation** phase involved partners deciding to collectively mobilise to create some kind of science park. The science park framing emerged because it finessed the problems that "business park" framings carried which would benefit one municipality but penalise ten others. Building consensus was time-

consuming and expensive, actors met repeatedly in different combinations to present their own interests and opinions and to seek a potential value-added compromise. The primary knowledge process was internal to UA, in which it used existing skills within the Department of Social, Political and Territorial Sciences, its own desire for expansion, and its institutional knowledge of the regional innovation priorities acquired thorough its past involvement in developing the region development strategy. Those three largely tacit knowledges were taken and combined internally into a set of reports that were then passed into and became part of the collective knowledge base. Municipalities absorbed that knowledge and transformed it internally to provide an answer to the question "what are the benefits and costs of a science park in another municipality for us?". This tacit knowledge then allowed the municipalities to support the science park notion. The knowledge combination process created knowledge that aligned with and supported individual actor's interests and produced a convergence that in turn transformed the meaning of the science park idea into being a relevant and timely regional innovation solution for Aveiro.

In the **articulation** phase, partners started to articulate precisely what kind of science park would be suitable for Aveiro. The knowledge combination process began again with UA, with an academic department using their contacts (internal tacit knowledge) to arrange a field trip for the group to help them understand the different models available for a science park. The intention was that the result should have been the same as in the articulation phase, namely that UA made its tacit knowledge available to regional partners who uncritically internalised it and used it to validate their internal interests. But in this acquisition step, the municipalities chose to acquire a very different set of knowledges from the collective knowledge base, acquiring the notion that it was a real estate development that was attractive to companies. That knowledge aligned with their internal interests, and because they believed that they were aligned with the collective understanding, it produced a consensus to proceed but a split in the shared knowledge between the network and real estate understanding of the "science park model".

The **strategic programming** phase involved the final confirmation of the

model, the choice of location and the precise content of the business plan. It was at this point that the split in the collective knowledge produced in the previous period became evident. Interestingly, this was in parallel with the project's leadership centre shifting from UA to the leading CIRA municipalities. The domination of the real estate framing disempowered the university and saw the initiative shift back to the municipalities, who used their internal knowledge to create business cases for the science park to be located within their own municipalities, aligned with their individual interests to host the science park. This produced a strong knowledge dissonance, with 11 different versions (corresponding to the 11 municipalities) circulating of what should be the correct way forward. This also destabilised the internal knowledge of UA, as they understood the science park as a network location, and with these changes and the changes of rector, they had to acquire this new reading and find a way to align it with their institutional interest for room for growth. This created a knowledge split within the university that separated the institutional knowledge base from the departmental knowledge use. One example here can be that the knowledge related to the ecological dynamics of the lagoon effectively disappeared from the university knowledge capacity relating to the science park.

The **realisation** phase was earmarked by a series of delays and problems that reflected the knowledge splits that had built up within the RIC: A key issue was this split between institutional and departmental knowledge within UA that hindered the internal creation of a tacit knowledge base for action having acquired the external knowledge. This was manifested most clearly in two areas. The decision to acquire land in a piecemeal way rather than through eminent domain – ignoring the knowledge about science parks – created a practical issues relating to site access. The decision to build on land of high ecological value – ignoring the different departments' knowledge – led to a conflict with the national environmental agency. It was in this phase that the lack of real convergence in the knowledge base was revealed, as the splits that had built up in the earlier phases meant that there were not the knowledge capacities in place within the RIC to ensure that the CSP development moved forward smoothly.

TABLE 15. OBSERVED KNOWLEDGE COMBINATION FAILURES IN THE CSP STRATEGIC PROCESS

	Progress	**Curation**	**Combination**	**Actioning**
Mobilisation	Producing a set of possible consensus points for an attractive innovative future	An elision between abstract ideas of what science parks are in general and what UA would want from any science park that would be created in Aveiro	The production of a collective knowledge that was aware of the benefits but in which individual costs were downplayed	There was a selection of knowledges that fitted with institutional interests to create a consensus based on the general not specific reading
Articulation	Agreeing which of the consensus points should be chosen (including pointing to pilots as evidence)	UA constructed a study tour programme that allowed participants to see science park benefits, without specifying a specific model	The case was made for a "Tampere-style" science park creating strong regional benefits without a clear definition of what those benefits were	Each RIC actor took one definition of the science park which fitted best with their own individual interests, not the collective definition of the costs/benefits
Programming	Committing resources to be spent on activities that will take a step towards the brighter future	The different municipalities came back with a proposal for action that embodied the real estate reading of a science park, thus, a municipality specific activity	A failure to situate the local development as a regional plan and to identify the necessary links and infrastructures to use it to drive regional knowledge spillover/networks	UA had to rework its internal knowledge architecture to fit with the real estate model, creating a split with the planning knowledge
Realisation	Using the delivered "infrastructure" to expand the range of possible innovative futures as the basis for new cycles	A failure to connect specialist domain knowledge to the action plans led to plans being made that did not adequately account for external circumstances	The park as being built did not meet with user needs and therefore there was not an emerging profile for CSP formed building on early tenant capacities	There was no clear idea within UA or CSP about which kinds of activities could be located within CSP to create regional collective/spillover benefits

SOURCE: AUTHOR'S OWN DESIGN BASED ON FIGURE 11

8.6 Conclusions

In this paper, we have asked "*How can actors within regional innovation collectives' develop regional innovation activities to improve longer-term regional economic performances?*". We have focused on the issue of knowledge combination in regional strategic processes, and in particular, the issues that arise when heterogeneous actors combine their knowledge to create collective understandings that are sufficiently robust to serve as actionable knowledge later in strategic processes. The key finding from our research is that problems arise in knowledge combinations early in the process in the form of fissures within knowledge bases. These fissures were either within organisations (such as the split in UA between planning knowledge, institutional knowledge and knowledge of the regional development strategy) or collectively (the persistence of a science park model that could be both a real estate and a regional network model). These fissures did not immediately hinder consensus but did become problematic later in preventing the utilisation of knowledge capacities (e.g. relating to the lagoon's ecological status) to deal with implementation problems.

We see here that these knowledge combination failures and fissures resonances with the notion of what Sotarauta (2016, Chapter 7) terms "strategic black holes" in regional innovation processes; The tendency of RICs to repeat the same innovation interventions rather than upscaling and creating a more comprehensive and transformative innovation infrastructure. Our research provides an explanation for these black holes – the fissures in the actionable knowledge prevent that upscaling process. The actionable knowledge does not travel well – a single actor can deliver a single intervention that fits with a strategy – but lacks the broad hinterland of combined knowledge to construe it as a regional asset. The next result is that partners are trapped repeating past successes rather than consolidating those successes into more widespread regional transformation. There is a fissure that prevents the development of a regional knowledge base in of support developing regional innovation activities to improve longer-term regional economic performance. We are here struck that the issue of developing this transformational regional knowledge base is dealt

with so frivolously in these agency activation approaches such as Smart Specialisation.

We regard strategic regional processes as building futures by potentially creating knowledge capacities for collective action, shifting from uncertainty to a clear plan of deliverable action. From this perspective, our findings are significant because they highlight that the process of building a common understanding is not a dispassionate nor straightforward learning process. Building knowledges takes place within the boundaries of what partners are prepared to understand, and the prior learning and understanding of the actors and the partners. What partners are prepared to understand is partly – but not completely – conditioned by what regional leaders seek to promote, and this partiality may be a problem as it is not possible to compel other actors to understand those knowledges.

In this case, the knowledge dynamic appears to be a significant element of the exercise of agency: agency is bound by the prior learning and knowledge of the actors – for example relating to the five strategic priority sectors for the regional innovation strategy which the CSP could potentially strengthen. Conversely, the capacity to exert agency relates to the capacity to strategically deploy and combine knowledge and understanding. We believe this represents an interesting contribution in terms of the lack of understanding of how agency is exerted and creates influence in regional innovation strategy processes – as well as achieving purpose upon path development trajectories. To take it back to Sotarauta's analysis, in our reading a "black hole" may arise when partners believe there is a shared understanding when no such shared understanding exists.

In this case, we see interesting resonances with the way that the strategic process functioned in terms of providing the basis for a convergence of divergent interests, beliefs and viewpoints. In a way, the idea of a science park in mobilising and articulating the strategic process served as what has been termed an "empty signifier" (see for instance Gunder & Hillier, 2009). The very point of an empty signifier is precisely not to have "any one particular meaning [and taking] on a universal function of presenting an entirety of ambiguous, fuzzy, related meanings" (Gunder & Hillier, 2009, p. 3). In an empty signifier, knowledge

fissures are not problematic because there is no need for the knowledge to have coherence; it is only later, when the empty signifier should become actionable knowledge, that these fissures become problematic. The "science park as an empty signifier" can help to establish a platform and bring different stakeholders together which – in an ideal case – succeed in opening up new horizons that they never planned for in the first place. Yet, the "science park as an empty signifier" can also lead to frustration in later policy circles when stakeholders realise that what they signed up for was blurry and turned out to be far away from what they expected. A key challenge here for both further research and policy-makers is how to balance the trade-off between early progress and later certainty in strategic regional innovation processes, and to ensure there are effective knowledge combination processes without hindering consensus and coalition forming.

Our case also highlights a methodological problem in the study of agency in regional innovation strategy processes, relating to the dynamics of collective understanding. Although partners apparently sincerely believed in the early phases that there was a shared understanding of the CSP as a collective regional asset, this model had not been successful in completely supplanting the local business park variant. Indeed, it was that second variant that framed the ways that the partners undertook the next stage of the process. There is, therefore, a need to look at these knowledge processes in a longer-term process, considering the competing forms of understanding within regional innovation strategy processes, foregrounding knowledge fissures, identifying which variants dominate, and the potential inconsistencies and controversies that emerge in the wake of those fissures. This suggests that "agency" in knowledge combination (successfully achieving a fissure-free shared understanding) is only revealed in later practice, and cannot simply be claimed by regional partners. More reflection is needed on how to methodologically analyse these situations, because simply claiming fissures exist on the basis of failures seems to risk making these fissures a "catch-all" explanation.

Our analysis also suggests that we need to be aware of the difficulties different actors might bring into a strategic innovation process or path development process. The university, often considered only as an important knowledge

provider, was a complex and messy actor in this process, and prone to knowledge fissures. While some UA activity in these knowledge combination processes made sense to some communities (notably the rectory team), this disenchanted some academics involved and thus lead to internal complications. This demands a rethinking of our understanding of universities and the role they play in regional systems reflecting their situation as complex actors with multiple roles, as "fissile" knowledge actors – prone to knowledge fissures that may create problems elsewhere in the RIC. We acknowledge the limitations of a single case in terms of wider conclusions, nevertheless, this research is a way to give room to the important discussion of micro-scale agent behaviour and dynamics of regional stakeholder coalitions. Considering the combination of individual actors' knowledge bases, activities, motivations and their involvement in regional processes as well as in the development of regional growth paths is a first step towards understanding how regions can be supported in their development efforts toward new futures.

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9 ORGANIZATIONAL COMPLEXITY AND STAKEHOLDERS MISMATCHES AFFECTING UNIVERSITIES IN REGIONAL DEVELOPMENT STRATEGIES

This chapter is under review as
Fonseca, L., & Nieth, L. (*submitted*) The role of higher education institutions in regional development strategies.

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Abstract

The emergence of collaborative approaches in innovation policy and regional governance has increased expectations for universities to engage in strategy making and assume broader roles and responsibilities. Nonetheless, complexities inherent to the policy process, regional context and universities' own institutional and organisational capacity are often ignored or under-explained when framing universities' roles. Although these roles are frequently introduced, they have been superficially conceptualised in the literature.

This study develops a deeper theoretical and empirical understanding of universities' contributions in the different stages of regional innovation strategy processes. Through a comparative case-study of four European universities it explores the variation of these roles by policy stage and university actors involved in the strategies. Findings suggest universities have expanded to perform new roles and that diverse factors determine their participation in regional strategies. However, strategic coordination within universities is needed for an optimisation of their engagement in the regional governance process.

9.1 Introduction

While formerly universities were linked to knowledge dissemination and production through teaching and research, they are now progressively assuming a more engaged and regional stance through a «third mission» of external engagement. This has translated into a growing number of bi-directional and network links with regional actors. Studies approaching universities' regional engagement have often focused on university-industry collaboration, resulting in a skewed perception of universities' regional roles (Pugh, Hamilton, Jack, & Gibbons, 2016). Nonetheless, universities have been garnering a prominent status in the design of regional strategy processes, with governance models and policy frameworks emphasising increased stakeholder participation and a knowledge-based approach to decision-making (Ansell & Gash, 2008). A recent and paradigmatic example is the EU's Cohesion Policy Smart Specialisation framework and subsequent strategies (RIS3), which have formulated a mechanism for collective stakeholder engagement in the Entrepreneurial Discovery Process (EDP) and highlighted universities' privileged position in guiding strategy design.

The increasing expectations placed upon universities, not only in regard to knowledge dissemination, production and commercialisation, but also regional governance and strategy design, demonstrate a need for more comprehensive assessments and understanding of universities' roles. Even though there are various studies and designations for universities' roles in the literature, these are often limited to university-industry interactions and entrepreneurial or economic impact, thereby working against the potential of universities to perform developmental roles (Marques, Morgan, Healy, & Vallance, 2019). There is still lack of clarification on the exact roles universities are performing and a tendency to conflate and homogenise these roles across institutions, contexts and timeframes (Flanagan, Uyarra, & Laranja, 2010; Uyarra, 2010). This is particularly the case in university-regional government relations, an arena influenced by the regional setting, political mandates and universities' interest and political predisposition in its external engagement. Given that the policy cycle is also

characteristically given to variations in actor involvement, commitment and scope (Birkland, 2010), this topic is especially under-explored in the literature.

This study will thus develop a deeper theoretical and empirical understanding of universities' contributions and, specifically, the practical translation of the roles they perform in the different stages of regional innovation and development strategy processes. Through a comparative case-study of four European universities in different regional contexts – Aalborg University, University of Aveiro, Autonomous University of Barcelona and University of Twente – this paper explores what roles universities play in regional innovation strategies and to what extent these roles vary depending on the policy stage or the university actors involved. Findings suggest universities have expanded on mere knowledge transfer to perform more planning-related roles (e.g. consultation, mediation), with high variance in regional context. In more peripheral regions the university tends to emerge as a predominant actor, which can allow for closer engagement throughout the policy stream. There is, however, an increased necessity for strategic coordination within universities for an optimisation of their engagement with governmental institutions and potential new stakeholders in the regional governance process. At the same time, regional stakeholders must be aware of the potential contributions of universities to regional policy/strategy processes, and which determinants influence universities' capacity and disposition to contribute.

9.2 Background

In a context of emerging collaborative approaches in innovation policy and governance, increasing expectations are placed upon universities to engage in strategy making and assume broader roles and responsibilities. Nonetheless, complexities inherent to the policy process, regional context and universities' own institutional and organisational capacity are often ignored or under-explained when framing universities' roles. These roles are themselves frequently introduced and conceptualised superficially in the literature. This section proposes analytical lenses that can provide granularity into universities' roles in regional innovation policy processes.

9.2.1 New/current governance approaches for regional development

There has been a tendency in the last decades to call upon a set of diverse stakeholders to participate in regional innovation and development strategies, agendas and policies. This aligns with the idea of bottom-up, collaborative regional governance, in which networks of state and non-state actors contribute to regional transformation processes (Ansell & Gash, 2008; Willi, Puetz, & Mueller, 2018). Governance habitually comprises the definition and implementation of regional strategies that define a shared regional vision, and the activities which must be undertaken to get there (Valdaliso & Wilson, 2015). Within the idea of collaboratively creating regional futures, governance transcends the state's traditional spaces to rely on various other actors. This has been picked up in different areas, such as the innovation policy literature. Namely, (Kuhlmann, 2001) argues that innovation policies are created in "multi-actor innovation policy arenas" in which different player networks negotiate the priorities of their innovation systems.

While there are increasing experimentations in collective governance, the fruitful participation of stakeholders in the process and the generation of a productive collaborative dynamic is often assumed. However, according to Birkland (2010), stakeholders' engagement in the governance process is given to variations, determined not solely by their own interest but also by the different needs of the process. A policy stages analysis (see for instance Tantivess & Walt, 2008) demonstrates this: at the policy formulation stage, the exploration and assessment of options is prioritised, so actors with the knowledge to present solutions tend to be recognised here, leading to the reiteration of their engagement in this manner. The implementation stage is given to more fragmentation and deficiencies, exacerbated by the fact that implementation actors are not often involved in the policymaking stage. Finally, the evaluation stage is considered an important – often under researched – part of the policy cycle, involving different stakeholders (Teirlinck, Delanghe, Padilla, & Verbeek, 2012). Sustaining a consistent level of interest, commitment and collaboration throughout these various stages is inherently a difficult task.

9.2.2 Smart specialisation, emerging expectations and variations in universities' roles

The expectation that a group of actors can define the drivers of regional innovation and development and collaboratively implement strategies towards new regional futures can, nonetheless, be found in a diverse set of policies. A recent and prominent example of these collective, bottom-up governance processes and respective strategies (Aranguren, Magro, Navarro, & Wilson, 2019) is the European Union's Smart Specialisation framework as an ex-ante conditionality for accessing European Regional and Development Funds in all European regions. It has introduced EDPs, a collective prospecting process in which regional stakeholders progressively identify and define regional strengths, priorities and trends and collaborate towards strategic development.

Next to the state, the private sector and civil society, universities have become major stakeholders in these multi-partner governance processes. Goldstein and Glaser (2012) and Foray et al. (2012) argue that they are not just central to the EDP, but especially capacitated actors to guide the strategy process. Thus, in the smart specialisation approach, universities are expected to become "entrepreneurial actors" involved in different aspects of design and implementation of the strategies (European Commission, 2017a). Specifically, Goddard, Kempton, and Vallance (2013) found that universities are important players in three main areas of these regional strategies: (1) they participate in the EDPs by generating knowledge and engaging with regional partners; (2) give academic support to government officials in defining the strategies; and (3) use their international connections and knowledge to connect the regional to the international scale.

However generalised these expectations might be across the European context, it is to be expected that the regional context influences universities' predisposition and activities in engagement and collaboration. In their study on universities' contribution to RIS3 processes, Elena-Perez, Arregui Pabollet, and Marinelli (2017) found that universities' engagement largely depends on a diverse set of regional configurations and instruments that originate different dynamics. Similarly, internal institutional characteristics – such as universities' disciplinary

focus, interface bodies, academic communities and individual actors – can greatly influence the type of regional roles they assume. This evokes institutional theory in that both internal and external determinants are seen as forces shaping the institutional mission and organisational structure (DiMaggio & Powell, 1983). Therefore, different types of universities inserted in distinct regional contexts can be assumed to undertake varied roles and engagement activities in a regional strategy process.

Boucher, Conway, and Van Der Meer (2003) have considered both external and internal determinants in universities' roles, furthering this argument. Among those stipulated, they consider as external determinants the type of region, the regional identity and network type and the characteristics of the higher education system. As internal determinants, the number, scale and age of universities in the region, universities' strategic orientation and their embeddedness in a regional strategy. These factors significantly shape the type of engagement a university delves in, and consequently, the regional roles it undertakes. A single university located in a peripheral region, for example, will have a greater alignment with regional needs, and be better positioned to be actively involved in its networks and shape the institutional environment.

9.2.3 A more comprehensive analysis of universities' roles

Literature on the roles of universities has emphasised the combination and intersection of several models of engagement, which can give rise to "contradictions or conflicts of policy rationales and objectives" (Uyarra, 2010, p. 1229). However thorough prior conceptualisations, studies on these roles still primarily focus on cases of university-industry collaboration (Pugh *et al.*, 2016) with few examples of an extended perspective of the «third mission» (Fonseca, 2018), e.g. universities' engagement in regional governance. Others are Aranguren, Larrea, and Wilson (2012), Goldstein and Glaser (2012) and Rodrigues and Melo (2013). With studies pending toward private sector links, and the more economic aspect of universities' regional engagement, this may lead to a skewed perception in the identification and conceptualisation of such roles, limiting the awareness of universities' effective and potential regional impact

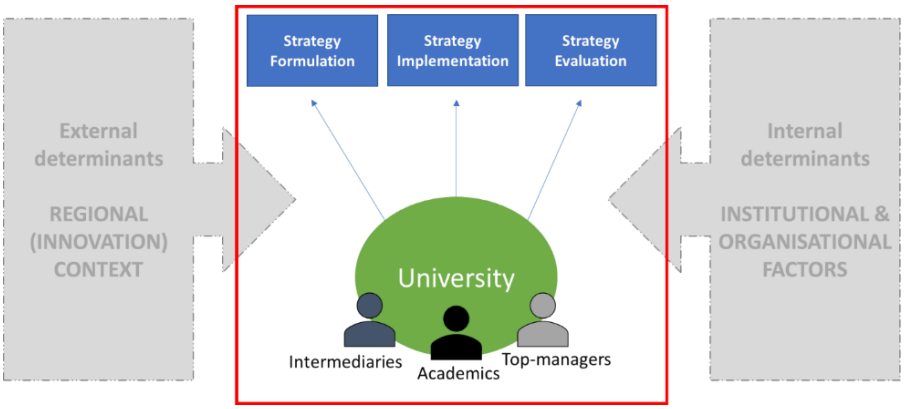
(Marques *et al.*, 2019).

Concomitantly, while universities are increasingly expected to contribute to regional strategies, they are not homogenous institutions that can be predicted to contribute evenly. What roles universities are expected to play may differ significantly from the roles they can play, or the roles they want to play. Such roles may also not be prioritised nor adopted at the institutional level, but by individual actors or communities within the university. They are 'loosely-coupled' institutions with complex and fragmented internal structures. So even though managerial and administrative levels provide directives to form a coherent discourse and procedure in the entire academic community, these directives often dissipate in their transmission to the lower levels of the institution. Benefitting from a high autonomy in the performance of quotidian activities, faculties, departments, research units, interface offices, technical staff and individual researchers can diverge in their priorities and approaches to tasks. Without disregarding this institutional and organisational complexity, we will focus on three main levels of universities: 1) managerial, 2) intermediary (i.e. nexus offices administering knowledge transfer and collaborative activities), and that of 3) individual academics. This can provide us with a relatively comprehensive analysis of the overall activities and roles universities perform in their engagement in regional strategies.

Finally, despite expectations associated with the multiple roles of universities identified in the literature (e.g. service-provider, connector, animator), there is still a lack of definition of what exactly they entail in practice and a tendency to conflate and homogenise them across universities, contexts and timeframes (Flanagan, Uyarra, & Laranja, 2010; Uyarra, 2010). It is widely underemphasised in the literature that in different contexts, different areas of action (e.g. policy, industry or community engagement) and stages (project application versus implementation), universities ultimately perform differentiated roles. For instance, in the case of their participation in regional strategies, depending on the phases of the strategy process, i.e. design, implementation and evaluation, universities can be called upon to contribute in specific forms, and themselves can assume varying levels of responsibility.

Thus, the need to understand differences in these roles and explore under which circumstance certain roles and activities are prioritised needs to be made explicit. This paper aims to introduce more detail to this underexplored area by asking the research question of "*What differentiated roles does the university, through its several levels of engagement (management, intermediary, individual), play in each stage of the regional innovation policy process (formulation, implementation, evaluation)?*". The conceptual model to be utilised, which considers the dimensions of university actors and their role in different policy stages, is represented in Figure 12.

FIGURE 12. UNIVERSITY'S PARTICIPATION IN THE POLICY PROCESS



SOURCE: AUTHOR'S OWN DESIGN

9.3 Methodology

9.3.1 Research approach

In seeking to understand the character of universities' participation in regional strategies, a social phenomenon, this study is inherently exploratory and qualitative in nature (Bryman, 2012). Through a comparative case-study approach, a better understanding of contextual and institutional factors is achieved. It enables theory-building by facilitating the drawing of patterns and conclusions across cases (Bryman, 2012, p. 73), therefore supporting replicability and contributing towards enhancing knowledge in the field.

Criteria for case selection considered universities who engaged in regional

strategy processes in the past 4 years, in varied economic EU. This paper draws on four case-studies of universities across different national and regional contexts: Aalborg University (Denmark), Autonomous University of Barcelona (Spain), University of Aveiro (Portugal) and University of Twente (The Netherlands) (Table 18). Despite their varied backgrounds, these universities possess broadly comparable characteristics. All are relatively young and entrepreneurial universities created in the last 50-60 years, and actively engaged in playing a leading role in their respective regions. Three are located in peripheral regions in their national context, while one was chosen to provide some regional economic variety in the analysis. Finally, all four universities, fruit of the context and motives for their creation, demonstrate an interest in extended engagement activities with their respective regions, particularly in regional development strategies and policymaking, and have adopted organisational models to enable this interaction. Used to engaging with external actors, namely companies, in a research commercialisation capacity, these universities' engagement in governance processes is yet to be explored in-depth.

The authors were directly linked to two of the investigated universities and spent research secondments of 3-4 months at each of the other 2 universities. Data collection took the form of semi-structured interviews and document analysis. Initial access to a small group of key individuals was given through project partners and stakeholders within and outside the university, subsequently a snowball approach was applied to access additional interview partners. Closure was reached when no new interview partners were recommended, and/or topics were examined from all possible perspectives. The recorded interviews lasted between 60-90 minutes and were transcribed as well as translated into English (when necessary). Interviews in Aveiro and Twente were partly conducted jointly, while interviews in Aalborg and Catalonia were conducted by one of the two researchers. Interviews included actors who were involved in the strategy formulation, implementation and evaluation process that came from strategic/management levels as well as project/executive levels (Table 17). Additionally, regional strategies, action plans, cooperation agreements and university documents were analysed.

9.3.2 Introduction to the case studies

In the following section, the four universities will be briefly introduced. Additional information about the universities, their respective regions and strategies can be found in Table 18.

Aalborg University (AAU) was established in 1974 in parallel to profound structural changes of the region that was once specialised in traditional industries such as construction, shipbuilding, food & agriculture. Thereby, the university became an important driving force in the renewal of the industrial structure, establishing a focus on research and development. Today, AAU has five faculties of which Social Sciences is the largest although AAU has as a strong technical and engineering focus (it was one of two Danish universities offering MSc in Engineering until 2000). The university still has a strong link to its regional industries through a high number of projects and networks. Collaboration with its surrounding community has been facilitated through a support structure, AAU Innovation, which manages clusters, knowledge exchange activities, networking, etc. AAU's problem-based pedagogic model also guarantees a high connection between AAU and the region through applied learning and teaching close to the local industry.

The University of Aveiro (UA), established in the early 1970s, has been aiming for regional relevance and scientific excellence since its creation, developing vital research areas for its region, such as ICT, ceramics and materials, and environmental science. From the beginning a close connection was formed with regional industry and public bodies at the local, sub-regional and regional level, with the university being considered a privileged partner and stakeholder. Instead of faculties, UA comprises 16 departments as diverse as Biology, Civil Engineering, Languages & Cultures, Mathematics and Medical Sciences. It also owns four polytechnic schools across Aveiro region, enabling a closer connection to the industrial fabric. Some degrees are jointly taught by different departments, research units and schools, promoting interdisciplinary, collaborative projects and learning (Hetherington, Coelho, & Valente, 2015).

The Autonomous University of Barcelona (UAB) was created in the late 1960s,

in a time when pro-democratic demonstrations and political turmoil, accompanied by a growing demand for a massified higher education system, required the development of flexibility and self-governance in higher education institutions to facilitate response to new societal challenges (Manrique & Nguyen, 2017). Despite UAB's location outside the city due to urban spatial limitations and the purposeful deviation of students from the above-mentioned protests, this did not hinder its links with Barcelona city, and benefitted its relationship with the surrounding region. UAB has adopted social responsibility within its mission and, given its investment and focus on its campus and research activities, it has successfully created links with industry and developed its knowledge transfer activities toward partnerships with public administration. Its research park, research office and the many associations connected to research and innovation based in its campus, have contributed to UAB's innovative and entrepreneurial endeavours. Its disciplines are varied but with a greater prominence of social sciences, humanities, economics, medicine and biosciences.

The University of Twente (UT) was established in 1961 with the aim to give the Twente region, struggling with the decline of the leading textile industry, a new future. The university has since then been aiming at creating a highly skilled work force for the region that could revitalise the industry. Within this development a focus on entrepreneurial activities, spurring the creation of a high number of university spinoffs and start-ups (often in the high-tech and IT sectors) can be observed. Being a technical university, the UT combines the faculties of Engineering Technology, Electrical Engineering, Mathematics & Computer Science, Science & Technology, Geo-Information Science & Earth Observation as well as Behavioural, Management & Social Sciences. Today, the UT is involved in many of the activities that are happening in the region, being an important partner in institutions and networks such as the business park Kennispark (Knowledge Park) and the intermediary organisation Novel-T.

9.4 Findings

The following section outlines universities' engagement history, the different institutional actors involved in regional strategies and the roles assumed in the

different policy phases (detailed information in Table 16).

9.4.1 AAU

AAU was created to stimulate regional development and has since been working very closely with regional partners such as the industry and public sector. Regarding AAU's participation in regional strategies, AAU assumes a relevant role in the regional Growth Forum (GF), a body created with regional development objectives. Besides government and company representatives, next to AAU, two other knowledge institutes are represented in the GF. The regional strategy, REVUS, is formulated by the region with input from the GF Members. In a next step, these members evaluate, recommend and decide on the distribution of funding according to the priorities defined in the strategy. Additionally, the AAU Innovation Director participates in the GF's preparation committee and therein also evaluates and decides on funded projects. A university leader described AAU in the GF as the actor who introduces research-based ideas and a "broader, less political and trustworthy perspective", thereby nominating it a counterbalance to the "political" municipalities.

Aside from formal engagement through AAU top-managers, academics were consulted in strategy formulation. This only happened when relevant connections between individuals (in the region and the university) already existed. In those cases, the region relied on AAU's knowledge in focal areas such as energy and sustainability. A project manager involved in the strategy formulation highlighted "I think we need each other. But at least [the region] needs [AAU] a lot, because we need them to address regional questions and [...] take the responsibility of being the biggest knowledge provider". AAU plays an important role in the strategy's implementation as it is a major beneficiary of funding and materialises different projects within the strategic lines.

9.4.2 UA

Despite being located in a less-developed peripheral region, UA has managed to leverage collaboration with businesses as well as local and regional government, often being considered as the "twelfth municipality" of Aveiro region. With its

creation resulting from the lobbying of local stakeholders to upgrade a stagnant industry, UA became a nexus of regional aspirations. This is particularly the case in its immediate Aveiro region, where it is the sole university. At the institutional level, this engagement rhetoric has been enacted by different institutions such as the technology transfer office UATEC and several appointed management positions, like the Rector for University-Society Relations and the Pro-rector for Regional Development. It is through the two latter top-managers, in conjunction with UA's Rector, that formal partnerships occur, namely in matters of regional innovation strategy. In turn, project management is conducted by UATEC, research units and academics.

The intermunicipal community of Aveiro region (CIRA), tasked with designing two territorial development strategies (2007-2013 and 2014-2020), invited UA as a partner. Interviewees considered UA's engagement as prominent in the formulation phases. The Pro-Rector for Regional Development position was created for this engagement, and a team – composed of technical staff and academics – was assigned to conduct regional analyses, participative forums and support collaboration with CIRA's municipalities. Policymakers and other external stakeholders appreciated UA's coordination and pedagogic approach, seeing it as providing "clearer guidance" on policy requirements, and keeping the involved stakeholders "working within the framework".

Nonetheless, interviewees highlighted UA's diluted engagement in the implementation stages, where UATEC and academics' project management was more punctual. There was a lack of internal coordination and strategic engagement, as "each department just [tried] to deal and [do] its own work". There was a consensus on the need to align institutional discourse with operational involvement, often dependent on efficiently managing incentives for academics.

9.4.3 UAB

Given Catalonia's innovative character, UAB has developed an entrepreneurial approach and regional societal engagement support structure (UAB 2019). It has been developing a territorial network of influence, coordinated by its top

management, of which the main «third mission» support nexus is the Vice-management for Research.

In the policy sphere, UAB engages at two levels: through its Vice-management for Research; and indirectly, through the Catalan Association of Public Universities (ACUP). Its participation within the smart specialisation strategy of Catalonia (RIS3CAT) was done through these channels, though highly variable across the policy process. According to an interviewee, while "there was a lot of interest by the government to have universities join the project", the complexity of Catalonia's innovation system led the regional authority (Generalitat) to limit stakeholder participation in the formulation stages. Instead, it opted for a survey-based public consultation and an expert council. Interviewees considered joint sessions as more informative than consultative, and widely agreed that "universities weren't given much voice in the beginning of the process".

Only through implementation instruments did universities participate more actively in the RIS3CAT. These include the RIS3CAT Communities, designed to facilitate collaboration across sectorial stakeholders, and Projects for Territorial Specialisation and Competitiveness, promoting territorially-based collaboration and managed by local government. UAB carried out several projects for RIS3CAT implementation. According to interviewees, its involvement was not just motivated by access to the European Regional Development Fund, but a visible attempt to "generate spaces of collaboration" and develop local innovative assets. Interviewees also saw UAB as providing more than scientific knowledge – also operational one, managing fund requirements and mapping "future actions".

Evaluation-wise, an individual UAB academic co-generated assessments with Generalitat, with no institutional-level engagement. University representatives emphasised that the RIS3CAT process lacked transparency and progress communication, providing few chances for continuous engagement and influencing the variation in UAB's participation.

9.4.4 UT

UT is one of three higher education institutions situated in the peripheral region of Twente. Its creation aimed at supporting regional economic renewal after the textile industry's decline. With a regional ecosystem lacking big economic players and company leadership, UT has been described as a coordinator and moderator. A high-level university manager claimed that "it's the university that sets the [regional] agenda and the industry that follows", explaining that UT takes on a "heavy responsibility" in the region's future. Different engagement activities are assumed at various institutional levels. The department for Strategy and Policy, under the Executive Board, has responsibilities in the preparation of strategic meetings with regional authorities. Another unit, Novel-T, serves as a knowledge and technology transfer office.

In practice, UT is involved in the design and implementation of the regional strategy, with no responsibilities in its evaluation. The president of UT's executive board represents the university's interests in the Twente Board (TB), a strategic economic board consisting of members of industry, public governance (province and region) and different education institutes. The TB consults on the design of the current regional innovation strategy (Agenda for Twente), influencing innovation policy design and regional prioritisation areas. University actors and regional stakeholders described UT's role in this process as vital, giving direction in potential regional economic opportunities and connecting with international partners. UT was also considered a "source of inventions" that can then be developed in projects financed by the innovation strategy. Aside from the formal role of the president of the executive board in the TB, academics are involved in so-called 'innovation tables' that discuss specific thematic areas and can orient municipalities and industry. A project manager from the regional governance body explained that these academics are very relevant in the process, as they use the projects "to disseminate their research efforts into practice".

9.5 Analysis/Discussion

Based on our four case studies, several consistencies and variances were

identified in relation to universities' tasks and responsibilities in the several stages of their respective strategy processes (Table 16). We will now relate this to the literature discussed and highlight the roles universities assumed.

9.5.1 Universities in strategy design

All strategies analysed included universities' participation but, comparatively, their involvement in the design phase was heterogeneous. In the cases of AAU, UT and UA, the universities' participation was done mostly through key top-management figures. In the first two these acted as institutional representatives in regional bodies that were developing the strategies, there conveying their university's strategic orientation. In the latter case of UA, they were specifically invited as partners in the territorial development strategy process, which enabled them to have a stronger involvement at several levels, with top-managers leading initial contact and major discussions, but with academics and technicians leading trend assessment and coordinating participative forums. All three were able to influence and provide guidance on regional priority-setting and performed one of the most highlighted roles of universities – that of knowledge providers.

These three universities were emphasised as crucial actors in their region's strategy processes, particularly in the formulation stage, where they distinguished themselves among other actors by their proactive stance and knowledge of regional potential (often in direct combination to the universities' strongholds). The most prominent university roles identified in the cases of AAU, UT and UA were those of 'leader', providing direction and guidance in an often complex and bureaucratic process; as well as 'facilitator', 'mobiliser' and 'moderator' roles, i.e., where the university leverages its networking capacity, attracting and engaging stakeholders to the strategy process, and creating or providing the conditions to effectively materialise collective regional objectives.

Interestingly, the cases here-mentioned, in which the universities had a stronger participation in strategy-design, were in regions where these universities were either the sole university (UA) or the most prominent (AAU & UT). All were peripheral regions, with Aveiro also being categorised as less-developed. Given these universities' heightened role in the design processes, and in the definition

and impact on regional development trajectories overall, it is relevant to emphasise that these contexts partly enabled the strengthening of this relationship.

In the case of UAB, its context of creation was more political than territorially-based, meaning that such direct interaction with both local, county and regional government was difficult to establish. The abundance of regional actors, namely the presence of several universities, inevitably generated competitive dynamics and limited more consistent university-regional government interaction during the RIS3CAT's design phase and overall policy process. This has been changing in recent years, with a greater approximation to the more local and county levels, where while still not the only university, it benefits from proximity and institutional ties. Nonetheless, in RIS3CAT, while universities were considered relevant, their indirect representation through ACUP has made it impossible to identify any role aside from 'consultative'.

9.5.2 Universities in strategy implementation

Universities' roles in strategy implementation have been found to be complex and multi-faceted in our cases, albeit lacking a strategic approach. The complexity is partly due to the variety of university stakeholders involved in a different capacity. University leadership was often involved in strategy implementation through their engagement in policy platforms such as the Twente Board and the Growth Forum (AAU). In these platforms, top management was part of a group of regional stakeholders that acted as project/funding evaluators, recommending projects to be implemented and funded according to strategic priorities. In Aveiro and Twente, a similar role was taken on by academics who participated in roundtables along specific thematic lines, providing research-based and internationally-linked knowledge that other regional stakeholders did not possess. This perspective distinguished the university as a knowledgeable and neutral evaluator.

Concomitantly, individual academics and research groups were identified as fund recipients and project partners (sometimes even leaders) in the implementation of instruments/projects, together with other regional stakeholders. Overall, this

role was very much dependent on individual motivation, the need for funding of individual researchers or departments, and the availability of potential (regional and international) contacts and project collaborators. Additional actors, such as UATEC or UAB's and UT's Science Park, were punctually involved at this stage by participating in – and, to a certain degree, coordinating – projects. Observably, further effort seems required to align the two levels of leadership and operational involvement. While researchers became involved in strategy projects and provided scientific and operational knowledge as well as connections, no strategic approach to project participation – aligned with the regional strategy – can be identified.

9.5.3 Universities in strategy monitoring/evaluation

Evaluation of the strategies and their results have been few or unobservable, potentially because most processes are still ongoing. Even in Twente and Aveiro, where analysis focused on two strategies, no official and comprehensible evaluation was done between the two. Only RIS3CAT includes evaluation/monitoring mechanisms for furthering the strategy's impact, even with scarce participation of other stakeholders. As in other phases, the Generalitat of Catalonia has chosen to develop its monitoring more closely with a selected expert. While a UAB academic, this has been emphasised as an individual, not an institutional participation. Given the emphasis of universities' knowledge provision role in other stages, their input to evaluation could be valuable for improved effectiveness. Their lack of participation is, therefore, surprising. Nonetheless, this could relate more generally to monitoring being a lesser preoccupation for government authorities, with them more inclined to use the start of a new period and the design phase as a form of evaluation (which is where the universities, indeed, do play a role). This is also in line with the findings from (Teirlinck et al., 2012, p. 374) in that "the planning of evaluation in the policy cycle remains ad hoc or exceptional, and the take-up of evaluation results is sub-optimal".

9.5.4 Actors involved in engagement and strategy processes

Having discussed the different roles of universities at different strategy stages, we identify that there are profound differences between the different institutional actors that engage in the strategy process. On the one hand, university top-management is often tied to regional partners through engagement contracts or specific roles in regional platforms. Accordingly, universities take a formal – even representative – role, in which top-management shows commitment to the region. Often, this commitment is not broken down internally and, therefore, while top management engages in these platforms, involvement in the strategy (design or implementation) does not trickle down internally at the level of faculties or individual academics. An illustrative one-man-show? We find that only at UA have top-managers officially recruited and included professors and technicians to become part of the strategy design process, while at the AAU, UAB and UT, top-management has coordinated first contact points between academics or heads of research units and external partners involved in strategy implementation.

Conversely, academics mainly participated in the strategy process autonomously, with most activities being conducted independently from top-management direction. Applying for projects within the regional strategy, e.g., or giving feedback on strategic lines, are dependent on intrinsic motivation mainly related to the need for funding, the wish to apply their knowledge, the commitment to external stakeholders established through long-standing partnerships, or the desire to build new connections. Most cases analysed show that, overall, individual engagement was unrelated to top-management behaviour or top-down stimulus.

Intermediary bodies, liaisons between external stakeholders and university staff, participated in crucial stages of the strategy processes. ACUP in Catalonia represented UAB and other universities in the region in the RIS3CAT design stage. In other instances, technology transfer offices like UATEC (UA), innovation and entrepreneurship organisations like AAU Innovation and Novel-T as well as research parks like PRUAB (UAB) provided a more specialised

perspective on regional innovation and some even coordinated academics for an effective involvement in the implementation stages. Regarding the latter, especially, they seem underutilised, as they could serve as that missing bridge between strategic orientation and operationalisation. Thus these intermediary bodies could be involved even stronger in strategic design and in the incorporation of different actors in the strategies, instead of often acting as fund recipients. Their involvement, highly defined by top-management and restricted by organisational resources, could thus be further optimised.

9.6 Conclusions

This paper explored the roles universities have assumed in regional governance processes, particularly how different circumstances have impacted on how universities participated in the design, implementation and evaluation of regional innovation strategies. When considering the circumstances under which universities participate in these strategies, mirroring Boucher, Conway, and Van Der Meer (2003), the types of regions and the context of creation of the universities influenced their degree of involvement and the roles they assumed. Similarly, the nature of their regional orientation and their predominance as universities in the region shaped the opportunities and extent of their governance roles.

Through a more granular analysis, the variation of these roles throughout the policy process was confirmed, as well as the fact that diverse university layers/agents interact at different times, scales and levels within the regional governance system. In line with Goldstein and Glaser (2012), top management was most often involved in strategy design in a formal representation of university's interests in regional boards/platforms. On the other hand, academics were asked to design/implement projects and thereby translate the strategic priorities into reality while applying their expert knowledge. This presents an interesting dichotomy between formal and informal modes of interaction. While agreements and other more formal, punctual and political type of interactions are managed between the top tiers and leaders of regional institutions, at lower organisational levels there is a tendency for more informal contacts to be

established by individual agents. These informal connections between engaged agents then give rise to more continuous forms of interaction that were considered crucial in ensuring the unlocking of impasses during the strategy process and resulted in wider and often unexpected benefits (e.g. institutional capacity-building, network expansion and pedagogy).

Furthermore, it is possible to conclude that different university stakeholders not only played different roles at different phases, but they did so not only from their own institutional volition but also from pressure of regional authorities and due to regional as well as institutional path-dependency. Those universities located in more peripheral areas (AAU, UA, UT) – often one of very few universities in those regions – tended to engage more directly with regional authorities and partners. In this analysis, this can also be connected to the context of the universities' creation, strongly linked to regional needs and expectations, and the consequent development of their institutional strategy in close dialectic with the region, and thus the regional government. This aligns with the findings from Aranguren et al. (2019, p. 8) in that "regionally influential universities and higher education institutions [can] fill the void of regional government capabilities".

Although the findings presented are limited to four case studies, they point towards an increased necessity for coordinated engagement and alignment between universities and governmental institutions, as well as new stakeholders in the regional governance process. The entrepreneurial character of the universities studied herein, and the overall context of their creation, assumes their openness toward regional engagement. Nonetheless, their engagement in strategies and regional governance was not only a more recent extension of their activities, but one that lacked exploration. Each university dealt differently with this engagement, which suggests a need for more granularity in the analysis of these roles and practices.

Broader generalisations can be made in that the regional setting, as well as the different stages of the strategy process, pose varied challenges, constitute opportunities and call for varied approaches to stakeholder engagement. In their work on territorial strategies, Valdaliso and Wilson (2015) point out that the rapid

emergence of territorial strategies in the last decades has accelerated the creation and implementation of those strategies before a conceptual and empirical understanding about them was established. Our findings confirm this, as it seems the particular role of universities has been developed 'on the go' – with apparent flexibility, but also vagueness regarding universities' contribution. Nevertheless, the involvement of universities in the strategy processes was, regardless of variance, a necessity in the guidance of these processes, providing crucial knowledge and resources throughout. The strategies' success would be in question without, at least, their partial input in any of the policy stages. Their undertaking of more strategic and influential roles appears, still, to impart more beneficial outcomes. Given the temporal limitation of focusing on particular policy framework periods, future research can explore effective socio-political and economic impacts of the universities' engagement in the strategy processes. We believe that through our case-study analysis, we offer policymakers an insight into how universities can take on strategic roles in regional innovation strategies and how these can be explored depending on regional contexts, and thereby contribute to the conceptual and empirical understanding of universities' roles in regional innovation and development strategies.

In terms of policy recommendations, different aspects must be considered. First, it needs to be assured that the regional partners know how to work together – not being restrained by their institutional differences (Nieth, 2019) – so that the regional strategy processes are effectively about regional development and not (just) about different stakeholders learning to cooperate while "[breaking] down silos between various administrative bodies and improve multi-level governance" (European Commission, 2017b, p. 5). Finally, the expectations towards the contribution of universities to regional governance processes are often not aligned with universities' capabilities. Uyarra (2010) highlights that more attention must be given to universities' complexity and diversity, and that we cannot assume these are highly flexible or integrated actors. This also applies to the regional strategy and policy process, especially considering that universities have become important stakeholders therein.

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9.8 Annex

TABLE 16. SUMMARY OF FINDINGS IN EACH OF THE CASE-STUDY UNIVERSITIES

	Actors at University Level			Quotes
	University Top Management	**Academics**	**Intermediaries**	
STRATEGY DESIGN				
AAU	• Rectory team participated in meetings with the Region in which the regional priorities (stipulated in the strategy) were aligned, selected & confirmed	• When necessary defined necessary, managers from the Region contacted their individual partners at the university to include the knowledge of these academics in specific areas	• Leadership of AAU Innovation also participated in meetings in which the regional priorities (stipulated in the strategy) were aligned, selected & confirmed	- AAU: "So one of the things we did […] was that we looked at what are we good at within research and where are some industrial strength, regional strength within that." - Region: "When we work on the specific focal areas, we can actually ask a professor […] so that we do not point to something that is outdated; we do not know anything about fuel cells, for instance." - Intermediary: "I think they [AAU] should be involved in it, to secure the big visions…"
UA	• Rectory team coordinated inter-institutional engagement & strategic orientation of UA in the strategies • Pro-Rector for Regional Development as main point of contact; participating in	• Top-managers assembled a team of academics & technicians to support engagement, analysis and public consultation in the strategies • Academics across UA participated in internal consultations in the beginning of the strategies' process	• UATEC participated in the drafting of certain themes of CIRA's strategies relating to valorisation and entrepreneurship	- CIRA: "Essentially the university has the role to keep us working with… in the framework, because we have the tendency to get out of it and try… and work as we can" - UA: "It was our job to, in a pedagogical way, give them [other stakeholders] this information for it to be successful".

	meetings, helping define priorities & co-leading the drafting of strategies			
UAB	• Feedback on final document • Participation in public consultation	• One academic participated in the Council of Consultants as an expert for the initial drafting of the RIS3CAT • Individual, not institutional participation • Other academics responded to the public consultation	• ACUP represented public universities in the RIS3CAT's Council of Consultants for the initial drafting of the strategy	- Generalitat: "This collaboration or participation of universities and other stakeholders is usually through these [implementation] instruments. Universities weren't given much voice in the beginning of the process". - UAB: "They say that universities participated, but who participated was a professor from the university".
UT	• President of the executive team & close advisors were actively involved in the Twente Board & the steering committee of the Agenda van Twente • They advised on priority setting	• Definition and concretisation of details within the thematic action lines is done by the region with help of specific professors • These contacts were either already existent or were facilitated through top management	• Novel-T is actively involved in the Twente Board and therefore also indirectly involved in the strategy	- UT: "Twente Board is quite important in arranging that people are talking to each other and kind of trying to focus on the same things. The university can play quite a steering role in that… the university [is] in a steering position. In terms of leadership, but not in deciding for others, but in realizing what's needed" - Region: "Of course, I will also ask [the UT President], he's an ambassador for the university. […] But if I talk about mobility, then I need a professor […] This is more at the expertise level of the professors. If you want to use the agenda as a stimulant in the region, then you need to look for something new. And this is where I found it very relevant that we have science."

	University Top Management	Academics	Intermediaries	Quotes
STRATEGY IMPLEMENTATION				
AAU	• Due to the role of top management in the Growth Forum and preparation committee, they actively participated in the selection of those projects funded and implemented as part of the strategy	• Academics applied for and participated in projects that are funded by those funds managed through the Growth Forum	• AAU Innovation and other intermediary bodies (such as the clusters) are recipients of funding and participants in projects • Overall, they were only remotely involved in the implementation	- AAU: "I think the university was involved in 70 to 80% of all things that happened. Together with companies, together with municipalities, with the tourist industry or whatever. We were used as some sort of knowledge source" - Region: "You might say that they [AAU] have a special role because they are in no competition with others ... I think sometimes it's a little bit too easy to be university, in regards to fundraising in the growth forum.
UA	• Partners in developing specific programmes and participation in fund management	• Participation in round-tables • Provision of useful knowledge to facilitate selection/approval of funding • Led and/or supported emerging projects	• UATEC coordinated participation in certain projects, particularly related to entrepreneurship • Managed UA internal academic contacts to boost and orient participation in projects	- CIRA: "UA creates conditions for us to operationalise, […] materialise our objectives". - UA: "We had this role in leading the strategy, we are partners in some programmes, but we are also service-providers in others". - UATEC: "Because of that we have started to be also in charge to manage one project that it's called IERA [Business Incubator of Aveiro region]. […] The other thing was the entrepreneurship lab of Aveiro region".
UAB	• Coordinated engagement within major RIS3CAT instruments	• Top-managers coordinated academic contacts internally depending on areas of interest • Some academics then developed direct links with external partners for the continuation of	• PRUAB was involved project coordination and participated in certain calls and instruments	- ACUP: "Yes, not so much in the execution phase or… […] no one has invited me to any presentation, or dissemination of results". - Generalitat: "The universities participate in all of the instruments".

		the project		Local gov.: "[Universities' knowledge] as a source to imagine other future actions"; "[Universities] are very willing and used to working with European projects, so they know very well. And that is something that other partners don't have". - UAB: "We can assemble a sort of mini-consortium that can provide a sort of consultancy to [municipalities] so they can initiate this sort of processes".
UT	• Top management is involved in the selection of projects through the Twente Board.	• Academics participate in strategic tables that initiate and discuss projects according to thematic action lines defined in the agenda	• Novel-T has a chair in the Twente Board, thereby selecting projects and participating in others	- Region: "Now you see them [the university] more on project level. And I think that's very relevant role […] using projects to disseminate the research efforts into practice." - University: "I don't think that the university is an organization that waits until people say "OK this is what the university can do". So the idea is that we will look at the strategy and see where we can play a role and how we can play a role in that"
STRATEGY EVALUATION				
UAB		• One individual academic is engaging with the Generalitat to generate monitorisation assessments		- Generalitat: "[They are] at the UAB and we are collaborating in this monitoring of the RIS3 […]". - UAB academic: "I am working with [Generalitat representative] on the monitorisation but, again, this is just me, it is not institutional-wide of UAB. I don't really see how they do that".

TABLE 17. INTERVIEW PARTNERS

Entity	Level	Aalborg = 30	Aveiro = 39	Catalonia = 19	Twente = 32
University	Top-managers	7	1	3	6
	Academics	6	15	3	3
	Technical staff	3	5	3	5
Regional Authority & Municipalities	Policy-makers	1	8		3
	Technical staff	5	3	6	7
Other entities	Industrial associations	3	3	1	1
	Companies	1	2		1
	Others	4	2	3	6

TABLE 18. COMPARISON OF CASE STUDY UNIVERSITIES AND THEIR RESPECTIVE REGIONS

UNIVERSITY	**Name** **Link**	**Aalborg** Universitet (AAU) www.en.aau.dk	Universidade de **Aveiro** (UA) www.ua.pt	Universitat Autònoma de **Barcelona** (UAB) www.uab.cat	Universiteit **Twente** (UT) www.utwente.nl
	Creation	1974	1973	1968	1961
	Students	20 729 (2017)	13 675 (2018)	37 166	10 400 students (2018)
	Strategic Foci	• Internationalisation • Inter-disciplinary; • Innovation; • Problem-based learning • Research Excellence	• Teaching, research & cooperation with society; • Entrepreneurialism; • Innovation; • Regional development	• Innovation; • Internationalisation; • Social responsibility; • Knowledge transfer	• Entrepreneurship • Societal Impact • "High Tech Human Touch" • Internationalisation
	Engagement Support Structure	AAU Innovation incl. Matchmaking & Entrepreneurship & cluster support; Career Centre; NOVI Science Park	Pro Rector for Regional Development; Vice-Rector for University-Society Relations; Technology Transfer Office (UATEC); University-Business Office	Research park; Vice-manager's office for Research; Hub B30	Department for Strategy & Policy; Strategic Business Development Office; Design Lab; Novel-T (incl. tech transfer, science shop, etc.); Science Park 'Kennispark'

			(GUE); Research Park; Business Incubator (IERA)		
	Further relevant education institutions	• UCN University College of Northern Denmark • EUC Nordvest, Centre for Education and Business	• 4 other Polytechnic Schools that are a part of UA (Design, Health, Management, Accountancy).	• 11 other higher education institutions (detailed list at Generalitat de Catalunya 2016)	• Saxion University of Applied Sciences • Art institute ArtEZ • 2 two further education colleges (ROC Twente / AOC Twente)
REGION	**Region Link**	**Nordjylland** Region https://rn.dk/	Intermunicipal Community of the Region of **Aveiro** www.regiaodeaveiro.pt	**Catalonia** Region http://web.gencat.cat/ca/inici/	**Twente** Region www.regiotwente.nl
	Admin. divisions	11 municipalities	11 municipalities	4 provinces	14 municipalities
	Capital	Aalborg	Aveiro	Barcelona	Enschede
	Population	587 335 (2018)	363 424 (2017)	7 441 000 (2017)	626 000
	Area	7,883 km²	1 692,9 km²	32 108 km²	1 503 km²
	Typology	• peripheral region with some areas defined by particular demographic and industrial challenges • below national average in terms of economic performance	• less developed • peripheral region in a country bipolarised in the major metropolitan areas of Lisbon and Porto	• developed and highly industrial region with the highest GDP in Spain • moderate + Innovator • economic hub between Mediterranean territories and continental Europe	• peripheral, especially in national comparison • Economic growth for 2017 by 3.0% (national economic growth 2.9 %)
	Industrial structure	• heavily based on SMEs • used to be dominated by traditional labour-intensive manufacturing industries & primary industries • today growth-oriented knowledge industries are	• heavily based on low-tech SMEs • highly industrial area, geographically and sectorally diffused, with a focus on ceramics, metallurgy, chemicals and agro-food	• mix of innovative industrial SMEs large multinationals, mostly in biomedical, agro-food, automobile and ICT, though predominantly concentrated in Barcelona's metropolitan area	• heavily based on SMEs • current focus on high-tech industry adapted by the majority of stakeholders (industry, education, government)

		also represented, but still need for catching up in terms of innovation performance	• since the 1970s, increasingly important in ICT and biosciences	• long tradition of scientific research and innovation	• high number of start-ups and spinoffs (often coming out of UT) • main sectors: manufacturing (metal, electrical engineering, chemicals), trade and health care

10 CROSS CASE SYNTHESIS AND DISCUSSION

This thesis is concerned with understanding how regional innovation coalitions—often comprised of partners with very different interests, capacities, goals and resources—can identify ways to work together to drive knowledge-based growth, particularly in less successful/peripheral regions. The focus for this thesis has been on examining how coalitions can take collective actions that may have an effect on the longer-term regional development trajectory, thus altering the development path and creating new, improved paths. This thesis has sought to highlight the internal dynamics of these coalitions and the ways that they are affected by this diversity of interests, capacities and goals. We have given particular consideration to universities, organisations which by definition are comprised of many different units. Each of these units has its own interests that do not simply map onto those of the region, and which do not necessarily correspond with the goals of driving knowledge-based regional development.

First, we analysed the notions of *university regional leadership* in these partnership activities and highlighted the importance of academic capacities in providing credibility/plausibility which university leaders can leverage if they themselves have the capacity to align with those academic interests. Second, we highlighted the consequences of the fact that *academics themselves can exert agency* mediated in the first instance through university leadership. A key influence on the performance and behaviour of universities in regional coalitions is related to the constraints universities wittingly or unwittingly impose on academics who play what we term institutional entrepreneurship roles. Influence is also exerted with respect to the ways in which institutional entrepreneurs (hereafter referred to as IEs) are enabled.

This implies that, third, a critical characteristic of universities and regional leadership is the extent to which universities are able to *align IEs' agency with the strategic leadership* they seek to apply, both in terms of internal and external alignment. On these grounds, we conclude that a defining characteristic of

successful coalitions is whether they are able to align the agency of their participants with the achievement of successful goals. This, in turn, leads to the development of a new model for these processes: rather than enabling agency, successful development is associated with aligned agency. These points are discussed in more length in the conclusion.

The six individual papers restructured into the previous chapters (4–9) address different dimensions of the research problem, with each presenting empirical and conceptual contributions to the established literature and practice. Thereby, each of the chapters contributes to the overall findings summarised and consolidated in this discussion chapter and the following conclusion chapter. Although this thesis is based on the three primary cases of Twente (NL), Aveiro (PT) and North Denmark (DK), some of the other cases from the empirical chapters are considered for the sake of completeness. Table 19 highlights which of the main themes are focal areas within each of the empirical chapters, thereby highlighting from which chapters the stylised facts presented here (Hirschman, 2016) are pulled together.

TABLE 19. EMERGENCE OF KEY THEMES WITHIN THE EMPIRICAL CHAPTERS

Chapter / Themes	4	5	6	7	8	9
10.1 Leadership	x	x	x			x
10.2 Agency		x		x	x	x
10.3 Alignment	x	x	x	x	x	x

SOURCE: AUTHOR'S OWN ELABORATION

As this thesis is an inductive and exploratory research effort (Chapter 3), the findings that are brought together here—with the aim of constructing a broader picture—are clearly based on the six empirical chapters. They are an attempt to demystify and stylize the process so that readers can see them as regularities (critical realism). Earlier, we created a conceptual heuristic (Chapter 2), which will be refined here with the use of these empirical findings and through the use of stylised facts. The next step in a critical realist methodology is to reflect on what

all of this means and the implications for these various fields, and this will be done in Chapter 11.

10.1 Regional leadership and institutional entrepreneurs

The existent knowledge gap on regional leadership identified in the literature review (Chapter 2) has led to the assumption that this form of leadership is enacted by strategic leaders who effectively direct academics as well as their organisations towards strategic goals. On the contrary, we have found that the regional leadership roles of universities in RICs are rather soft, emergent and informal, and are performed by IEs in the context of peripheral economies. It is these acts of IEs that can then alter regional architectures to achieve the desired regional path development effects.

In the following, we will demonstrate three areas in which we have found the above-presented assumption about strategic leadership to be incorrect, thus advancing a richer empirical and theoretical account of actual regional leadership. First, we highlight the importance of IEs as actors taking on leadership roles and affecting regional development. Second, we focus on strategic leadership as leveraging the capacities and activities of those IEs. Finally, we demonstrate how IEs provide some measure of credibility/plausibility for their leaders to act in regional innovation coalitions.

10.1.1 The centrality of academics as institutional entrepreneurs creating capacity

The first area where our findings challenge the strategic leadership model is in considering who the actors are within universities who are actually able to meaningfully exert influence on regional collective activities, and what their interests and capacities are. In contrast to the existing assumptions, we have identified that the role is played by what we call IEs. These individuals may formally occupy managerially titled positions, but at the same time, they are themselves primarily involved in knowledge processes, and regional engagement for them is a means to access resources that may help them to execute these various knowledge activities. In building these regional knowledge links, their

efforts have been found to have developed new regional activities, but they were also associated with identifiable changes in internal institutional architectures within their respective universities.

We here highlight three mechanisms through which IEs are able to change the inside (of the university) as a means of contributing to the outside (the region): (1) they can mobilise networks through which joint projects are created and implemented; (2) they can shape the institutional pillars of their universities; and (3) they can create and implement new institutions that facilitate their activities and thus enable their contributions to the region.

In Chapters 4 and 5, we saw that IEs in the diverse regions were able to create new activities through enhancing existing networks (for instance, by learning about each other's capacities), connecting existing networks/communities and building new networks with regional partners. These connections enabled them to directly approach regional partners with new ideas—such as the Aveiro Creative Science Park or the Twente Fraunhofer Centre—and jointly translate them into concrete plans and new realities. Thus, the flexibility and emergent leadership provided by IEs has made the **mobilisation and extension of networks** as well as the **construction and execution of joint projects** possible. In return, these networks and projects were found to have supported regional embeddedness/integration and, subsequently, development.

The university IEs also attempted to create new activities to respond to regional knowledge needs, which were shown to bear the potential to grow into broader processes of institutional change within universities. Thus, they were able to **shape the universities' internal institutional pillars/practices** to bolster the overall orientation towards creating useful knowledge for external actors. A productive interaction and commitment between policy and university leadership can thus enhance the flexibility of universities so that IEs have the potential to test new institutional setups (Chapter 5).

Within the same chapters, we have also demonstrated cases where IEs were attempting (in party successful ways) to **create new institutional practices** through a process in which change was first mobilised, then initiated and

continued, and finally embedded. Thus, we were able to identify evidence that points towards the potential of IEs being able to meaningfully change the institutional architecture of the university in order to make it more applicable for themselves, thereby often improving the overall university engagement capacity. A concrete example from the empirical studies is the creation/adaptation of AAU Innovation as a way for IEs to gain easier access to support structures and external partners (Chapters 5 & 6).

10.1.2 The role of senior leadership leveraging institutional entrepreneurial capacity

The second issue here is that the leadership capacity of university leaders/managers relates explicitly to the credibility/plausibility that they are accorded by regional partners. This, in turn, relates directly to the value that regional partners place on the collective knowledge contributions made by academics/IEs. Thus, it is the university leadership/management that needs to find ways to leverage the capacity and credibility/plausibility of their second-order leaders (the IEs), as the IEs' actions can result in giving the leaders strategic power in RICs.

This is a delicate balancing act, and, based on the findings in the empirical chapters, we have created a first typology of the different ways in which this is possible. First, university leadership can create an internal architecture that is conducive to enabling the activities and endeavours of potential and established IEs. Second, policies that support and acknowledge regional engagement and knowledge exchange activities can be introduced and implemented by university leadership. Third, leaders can introduce networks, projects and settings in which IEs have the option to share their burdens. These repertoires have in common that they create frameworks that allow IEs to engage at the functional level of knowledge exchange.

With respect to the first point, leaders could ensure that **institutional architectures can be beneficial for IEs**. Examples can be found in Chapters 6 and 9, where we highlight that one way to realise this is through the installation of specific offices to support IEs. Concrete examples are the AAU Innovation

Offices (Aalborg University), Aveiro's Technology Transfer Office and the intermediary organisation Novel-T in Twente. All three are examples of different architectural elements within and outside the university that are aimed at providing services and support for researchers, students, managers and others interested in regional engagement and eager to create joint projects/initiatives with regional partners.

Second, leaders can introduce **policies/statutes directly supporting, recognising and acknowledging regional engagement activities**. This can be done, for instance, though establishing regional engagement as a viable part of a successful academic career. An interesting example from the empirical studies is the problem-based learning and research approach of the University of Aalborg. Here, the engagement of researchers and their students with regional partners (in both the public and private sectors) is a vital part of the university's overall approach, and therefore garnered support from senior management (Chapters 5 & 6). Although this interaction in itself might not be one definitive of institutional entrepreneurship, it can establish contact between IEs and their external partners for future projects/initiatives. As highlighted in Chapter 6, Aveiro also attempted to create an academic career evaluation system that included regional engagement as one criterion of success. Nevertheless, this system turned out to be rather unclear and bureaucratic, and ultimately discouraged IEs to report their (regional) engagement efforts.

Third, leaders can help to institutionalise the support of relationships and/or networks of activities in which IEs **share the burdens and costs between each other.** This type of support can have the added side-effect of different IEs getting to know each other while also potentially developing new initiatives together. The early version of Aalborg's matchmaking system can be interpreted as such an initiative (Chapters 5 & 6). Here, different university actors (academics and managers alike)—most of them already actively engaging with the region—received additional support and recognition in their existing activities and were connected through joint events. This project together with the recognition of becoming a "matchmaker" can be seen as a way through which leaders used elements of the institutional architecture to **shield their academic actors and**

allow them to engage in their knowledge activities.

10.1.3 The interplay between institutional entrepreneurs and senior leaders

The third point is that there is an interplay between institutional entrepreneurs and strategic leaders from which credibility/plausibility emerges, and strategic leaders can deploy this advantage in their strategic leadership roles. Thus, we have established that the interplay between university senior leaders/managers in RICs and internal IEs active in regional knowledge exchange activities is shaped by the credibility/plausibility that they "lend" to each other.

A critical point here is that the credibility/plausibility of senior managers is not derived from their managerial or heroic nature; in actuality, this credibility/plausibility to deliver or mobilise capacities is assigned to senior managers from their functional level. However, senior managers cannot actually control the actors at the functional or operational level, and instead, they need to find a way to capture that capacity and empower the IEs to deliver the desired outcomes which the senior managers can then "sell" to RIC partners.

As outlined in Chapter 6, when there was alignment between regional capacities within the university structures and the managerial leadership's intentions, then this provided credibility/plausibility for those managers in regional leadership coalitions. For instance, when the regional networks of academics and the potential benefits of these networks were congruent with the visions that their managers/leaders were projecting to their RIC partners, credibility/plausibility was strongest for both sides. On the contrary, when we detected some dissonance between these capacities and intentions, the capacities for managers to exert leadership in coalitions were undermined. We also observed cases were engagement was approached more instrumentally or opportunistically by university managers, leading to a gradual weakening or loss of those managers' credibility/plausibility in the coalitions, as there was an evident mismatch between manager claims and university regional knowledge spill-overs in such cases.

While this argument is strongly inspired by Chapter 6,[15] it is also visible in other chapters of this thesis. For instance, in Chapter 5, we saw cases were university leaders were not authorising what their institutional entrepreneurs are doing; this was evident in the Twente Fraunhofer Project Centre having complications in finding a suitable setting within the university, and the Aalborg matchmaking initiative losing its former structure and influence. In both cases, the initiatives suffered a downfall in their development and—only after intense restructuring and further effort of the IEs—they are today portrayed as successful examples of regional engagement. As a result of this transformation, both initiatives are actively used by university leaders and managers in their interactions with RIC partners. Thus, they create credibility/plausibility.

10.1.4 Towards a heuristic for the interplay between institutional entrepreneurs and senior leaders

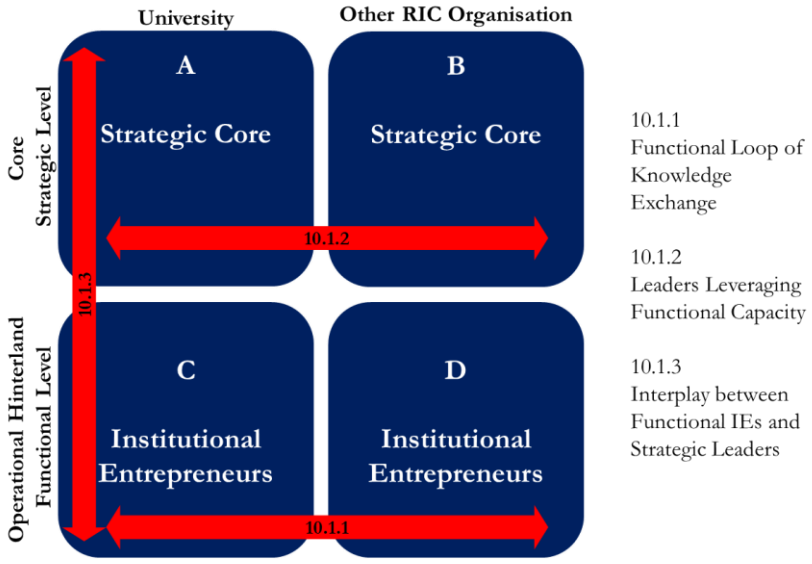
Credibility/ plausibility emerges in an interplay between IEs and the university's senior leaders/ managers. It is a dynamic and unstable evolution that requires a cautious balancing act between the two sides. This ongoing interactive development is a critical element of the leadership role universities can play. The crucial point here is that the relationships/interactions between the elements of 10.1.1 (IEs), 10.1.2 (university leaders/ managers) and 10.1.3 (credibility/ plausibility as an interplay of 10.1.1 and 10.1.2) constitute a field of tension; they do not simply interrelate, and the different actors are interconnected in a complex way, thereby affecting the way that agency is exerted.

While the contribution of universities to RICs is all too often judged on the strategic claims they make at a leadership or managerial level, the credibility/ plausibility of those claims heavily depends on the functional capacity they deliver, which is directly linked to the IEs. Indeed, while senior leaders are "spending" credibility/ plausibility in RICs, they earn this credibility/ plausibility because of their IEs. Consequently, they need to find a balance between "how

[15] In Chapter 6, we chose the term "legitimacy", which is not used here as it can be misunderstood as a highly conceptual term, while credibility/plausibility are more suitable in the overall light of this thesis (see also Annex I: The university, the region and non-analytic concepts).

much" they want to earn and what they will be able to spend. Thus, the contribution of this section consists of proposing a heuristic for this interplay as a way of relating emergent strategic leadership and IEs' capacities. What emerges here is a function of the *coupling of strategic leaders and institutional entrepreneurs via credibility/plausibility* in terms of what regional partners value and are willing to support.

FIGURE 13. INSTITUTIONAL ENTREPRENEURS, LEADERSHIP AND THEIR INTERPLAY



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10.2 Agency

The second issue relates to the agency that IEs and university leaders have in order to operate within the web of tensions imposed by the interrelationships depicted in Figure 13. On the one hand, these tensions may lead to constraints on actors, while on the other hand, individual actors can still free themselves from these restraints and ultimately shape the environment within which they operate.

This constitutes a complex system for agency. There are evident tensions that

can constrain the enactment of agency, but at the same time, there are enablers for agency which allow the constraints to be broken down (Figure 14). The following sections outline the constraints (10.2.1) and enablers (10.2.2), creating a framework through which to better understand agency.

10.2.1 Constraints on (institutional entrepreneurs') agency

The agency of IEs can be constrained by different elements and kinds of relationships. First, strategic leadership can constrain IEs from exerting agency when they focus on specific internal priorities and are not open to considering new or different IE activities. Second, the relationship between strategic leaders and external partners with their predefined priorities can constrain the agency of IEs. Moreover, the relationships between IEs and external partners can become a constraint in itself when external partners lack the capacities to support IEs.

First, working at the functional level, IEs can be caught or disenabled when working with others at their respective strategic level. Indeed, it is the hierarchical intra-organisational **relationships between institutional entrepreneurs and strategic leaders** that can constrain IEs from exerting agency. An example of this constraint can be taken from Chapter 5, where the installation of the Fraunhofer Project Centre was severely slowed down by the university board and the rather reluctant decision-making processes that constrained the agency of the IEs. We can see through this example that different actors have their own inter-relations, and while the IEs have to exert the agency, the tasks for leaders and managers involve encouraging and empowering the IEs. Nevertheless, the relationships between these two groups are not exclusively forged for regional development purposes. In the empirical chapters, universities (represented by the leaders and managers) often prioritised excellence in research over engagement, or internationalisation over regional activities (Chapter 9). Thus, there can be a general engagement-agency deficit caused by this field of tensions.

Second, the **relationships between strategic leaders and external partners** can constrain the capacity of IEs to exert agency. Within a regional setting, partners interrelate for many reasons and with different aims, based on their own strong institutional as well as individual desires. Thus, there is a rather small

interaction space for regional innovation strategy in which agency can be exerted. Additionally, there is a tendency to approach the RIC as a total rather than looking at the RIC as an intersection of organisations, each of which has its own constraints but whose inter-relations structure the field that influences the way agency can be exerted. In Twente, for instance, the university and region decided that their relationship would be based on the theme of excellence and the priority sector of high-tech (Chapters 7 & 9), placing particular expectations and demands on institutional entrepreneurs. This might obstruct those IEs that engage with regional partners on the basis of other priories and themes which are not considered to be as relevant. Accordingly, future engagement is likely to be shaped by predefined key themes, and the relevant actors might thereby overlook other essential topics and knowledge exchange activities that could be developed.

Finally, the **relationships between IEs and external partners** can become a constraint when an external partner lacks the capacities to support IEs. In these cases, external partners have tended to be conditioned by their inter-organisational power relations as well as the distance and hierarchy between individuals. Indeed, in those cases where the functional level of the external organisations was less dependent on its organisation's leaders or managers, it was able to become a more powerful partner than if it had been restrained by hierarchy. On the contrary, in those empirical cases where the distance between hierarchical levels was low, the functional levels could engage more easily with their counterparts at the university. In contrast, in those cases where power distance was high and hierarchical thinking was prevalent, external actors were bound to their organisations' leaders and visions, and thereby could not engage as freely with the university's IEs (as seen in Chapter 8).

10.2.2 Enablers for (institutional entrepreneurs') agency

Individual actors have also shown a repertoire of how to free themselves from the constraints imposed upon them, and have thus enacted agency as well as created spaces for themselves within this tension-laden architecture (Figure 13). Accordingly, the actors freed themselves from being shaped exclusively by organisational contexts and their strategic leaders, and instead created their own

spaces of agency. We identified two key repertoires of IEs being enabled in their respective agencies and creating credibility/plausibility for strategic leaders: (1) when IEs were able to create and utilise strong functional linkages with external partners/IEs from the hinterland, and (2) when IEs managed upwards and conditioned their leaders.

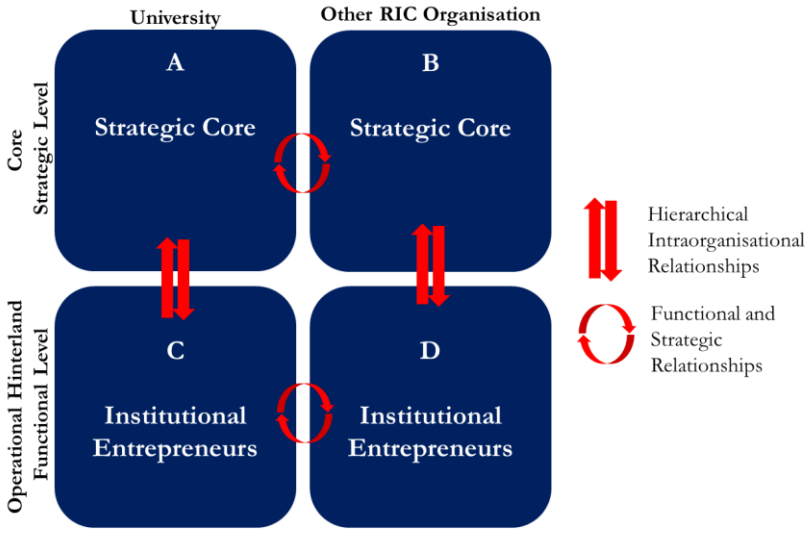
Most significantly, we identified the existence of **functional linkages with external partners** for knowledge exchange processes as an enabler for the enactment of agency. Indeed, within universities, IEs and their informal regional connections showed a more continuous form of engagement with and commitment to their region and its development (Chapters 7 & 9), especially in relation to their knowledge activities. In contrast, senior management was seen to be involved more periodically with much lower commitment levels and less of an effect. Thus, through personal connections, past interactions and experiences of IEs with regional partners, IEs were able to leverage these into resources/opportunities and enact agency. In Chapter 8, we saw that the idea of creating a joint "big project"—which in this case turned out to be the Creative Science Park—was initiated and discussed between stakeholders at different hierarchical levels at the university, the inter-municipal community and, albeit to a much lesser extent, private sector associations. Thus, because individuals from the university as well as from outside the university had already established a good level of interaction between each other, they were able to leverage these connections and experiences into an initiative that was expected to bring regional development and innovation.

Second, we saw another enabler of agency in the ways in which institutional entrepreneurs were able to **manage upwards** and **condition their leaders**. Thus, when partners at the functional level created new projects and initiatives with the potential for regional change, this could turn into a benefit for external partners as well as a means by which such partners could condition their leaders. Thus, in a next step, the leaders of regional partners such as municipalities or companies could then introduce these activities to university leaders as relevant and important for the region. For instance, when external stakeholders such as a local company in Twente or the Province of Overijssel pushed for the

Fraunhofer Project Centre, it was more facile to convince the university board of the relevance and necessity of the IEs' activities (Chapter 5).

IEs are crucial within this architecture as there is an interaction between the ways that regional strategic activities are created or implemented and the ways that particular actors are able to exert agency and deliver changes that ultimately shift path trajectories. Nevertheless, it is not clear how this interaction works, nor is it apparent how collective strategies influence the ways that IEs exert agency to deliver change. In the cases discussed in this thesis, we were able to identify that these individual change agents/IEs often faced tensions that inhibited them from exerting change agency (10.2.1), and that they needed to be empowered and mobilised to do precisely this (10.2.2). In this type of setting, there are organisations that have relationships with other organisations, and they have set structures for their employees. However, at the same time, the employees can create space for agency by building functional relationships with other, external partners. Thus, agency emerges in this complex interplay between IEs and institution leaders who make arrangements and agreements with each other (Figure 14).

FIGURE 14. THE ARCHITECTURE OF ENABLERS AND THE CONSTRAINTS OF AGENCY



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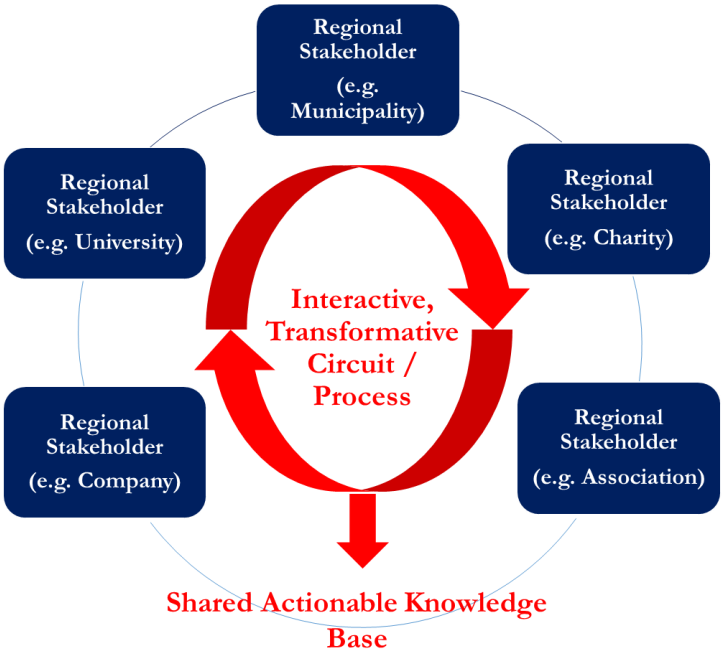
10.3 Alignment

The objective of this analysis of leadership and agency was to develop an understanding of the complex and multi-faceted architecture of different interrelationships and interdependencies. Alignment between these two elements has therefore crystallised as highly relevant and essential for this architecture to work. Nevertheless, alignment is an intricate endeavour—not as easy as is often assumed—affecting the interaction of partners as well as the development of regions. Thus, while there is an underlying assumption that regional partners are easily aligned, we here have presented *prima facie* evidence that there is a mismatch between them. The natural link between the two elements of leadership and agency seems to be that there is a potential conflict between them. Thus, the emergent theme is centred on the problematic of alignment and the continuous depiction of happy family stories in conjunction with the underlying optimism of the triple helix discourse (taken up in academia as well as policy).

Indeed, the complex process of strategic alignment between the elements has not been dealt with per se, as it is often described as an "ordinary and easy" process both in academia and in policy. Examples can be found in Chapter 2, where policy agendas such as RIS3 and CRA were introduced. This highlights the need for a more profound recognition of the fact that strategic alignment is not easy and is instead an extremely complex process. This research provides insights into how alignment really operates in ways that allow universities to exert strategic leadership. On the basis of this finding, we suggest that alignment involves attuning between two circuits: (1) alignment between stakeholders and (2) internal alignment within one particular type of organisation.

10.3.1 Strategic alignment between stakeholders

FIGURE 15. FIRST INTERACTIVE CIRCUIT BETWEEN REGIONAL STAKEHOLDERS



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The findings from the empirical chapters clearly indicate that the pooling and aligning of regional stakeholders' individual ambitions and interests into joint visions or goals is a very complex, sometimes even infuriating process. It is assumed that alignment happens easily and does not require any specific resources, effort or attention. Indeed, in Chapter 8, we saw that knowledge combination processes between regional stakeholders are highly complex, and that challenges often arise when partners are trying to generate collective or aligned understandings. The different stakeholders involved (the University of Aveiro, the inter-municipal community CIRA and the business associations) underwent a troublesome and challenging process of alignment by combining and transferring knowledge between each other (which was later to be absorbed). This knowledge circuit had the anticipated result of strategic learning between

regional partners and the creation of a common knowledge base.

Strategic processes between partners can thus be interpreted as interactive learning circuits, in which stakeholders aim to produce an actionable knowledge base antecedent to action. The creation of actionable knowledge is thus the basis for the partners to actually "get things done". Thus, while alignment between partners might look to be trivial in certain instances, we know from the cases of this thesis that the production of new, combined, actionable knowledge bases through a constructive and interactive process needs to happen, and this is a means of going beyond "just" moving abstract knowledge around between partners (Figure 15).

We perceived the persistence of **empty signifiers**—stakeholders being able to agree with an idea or plan despite not really knowing what they agree with—as a symptom of the challenge of alignment between stakeholders. We identified that in a successful process in which actionable knowledge is created between stakeholders, these empty signifiers should be "filled up" with content. Only a "filled" signifier would then allow for a continual transformation between the partners and across organisations. Thus, while empty signifiers were created with the best of intentions, sometimes they just did not get filled up along the way, and thus a progression towards actionable knowledge between the partners did not happen. We clearly observed that in order to take a step forward, partners did indeed make these open-ended commitments to empty signifiers; they held the coalitions together at the start, with all partners committing to the project and having the best intentions of taking the coalition forward.

In Chapter 8, we saw that the overall idea of various stakeholders creating "something big" was demonstrated by the Creative Science Park. While this knowledge process was complex, and problems between the stakeholders emerged, the empty signifier helped to unite people. The idea of creating a new system that would match the interests of the university's internal and external partners can be interpreted as an empty signifier in Chapter 5. This general idea was then translated into the Aalborg matchmaking scheme by the partners involved. Another example of an empty signifier building the basis for

stakeholders to come together in Twente is the idea of aligning around the key theme of technology without knowing what this meant for each individual organisation (Chapters 4 & 7).

In all these cases, it was clear that the stakeholder underwent an interactive—often creative and uncertain—process throughout which the empty signifiers were (at least partly) filled in with content, and an actionable knowledge base was (to a certain extent) created. Thus, the role of the interactive knowledge circuit/process is to ensure that there is a filling up of the empty signifiers without disrupting the coalitions in themselves. Empty signifiers also became noticeable as an answer to the "parish pump" problem (Chapter 7). Thus, while actors often remained very close to their own interests and priorities, aligning around an overall shared goal (the empty signifier, which would generate "something" for everyone) was a step forward. Indeed, it was this alignment around a common goal that allowed them to overcome the "parish pump" problems, work together and initiate the interactive, transformative process of producing an actionable knowledge base.

These first points can be directly linked to the findings in Chapter 4, in that **causal reasoning** between partners produced regional strategies that were relatively easy to support (for the diverse stakeholders), largely because they excluded almost nothing. At the same time, this meant that these strategies did not provide a useful selection guide for regional partners. Thus, partners aligned themselves around loosely defined goals or aims (empty signifiers) using causal reasoning. In the cases where **effectual reasoning** was applied, the strategies and related projects became more flexible and selective, allowing for adjustments through the interactive process of producing actionable knowledge. Thus, causal reasoning can be identified as a barrier to the knowledge circuit, while the effectual flexibility seemed vital as it ensured that there were no unnecessary constraints imposed on the actors, and that they would work to support the exercise of agency.

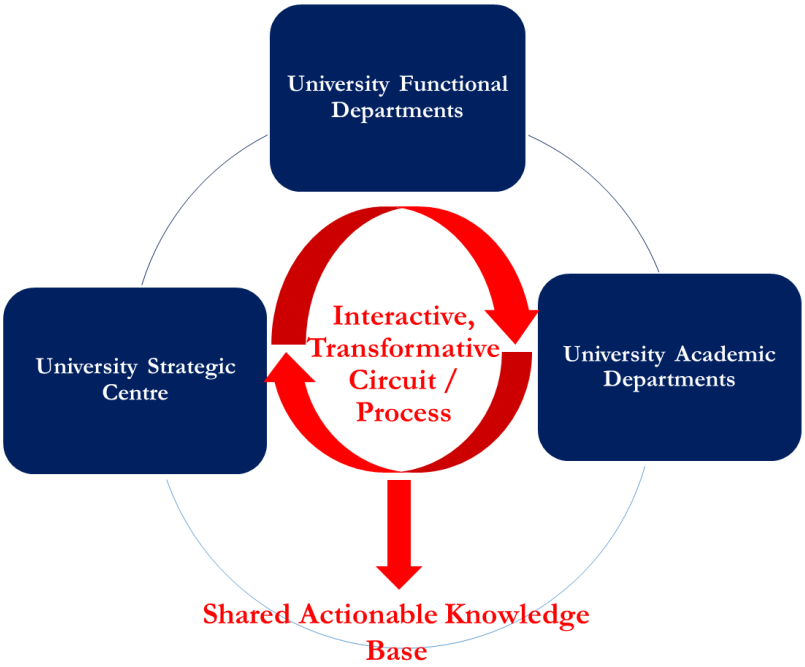
In relation to the complexities around alignment between diverse regional partners, **universities** stood out as intricate actors with multiple roles that

created tensions when aligning with external stakeholders. They appeared to be "fissile" knowledge actors prone to knowledge fissures that can create problems elsewhere in the regional innovation coalition. One of the aspects that makes universities complex partners is that while they have a lot of knowledge, this is not immediately reconcilable at the level of regional relevance. Thus, many different groups within the university hold knowledge and expertise on different themes, but in their interactions with regional counterparts, they might use, share or apply different or possibly unsuitable approaches.

Accordingly, in Chapter 8, we saw that diverse disciplines perceived the idea of the Creative Science Park differently and therefore drew radically divergent conclusions on how, why and under which conditions they were to interact with regional partners. Because of their own distinctive understanding, some actors within the university aimed at focusing the CSP on regional companies, others hoped for international recognition and still others hoped to establish a place to engage with society. Thus, each of these groups engaged with and focused on other regional partners, activities and projects in their own ways. This misalignment with their external partners created complications within the RIC as the external partners did not realise that their university counterparts were a fraction of the overall organisation; this limited perspective often resulted in complications such as slow progress and unclear task distribution.

10.3.2 Internal alignment within organisations (universities)

FIGURE 16. SECOND INTERACTIVE CIRCUIT BETWEEN INTRA-UNIVERSITY STAKEHOLDERS



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The analysis shows that different goals and frames of reference—as well as the difficulties with the translation and exchange of knowledge between participants holding up those goals/frames of reference—have crystallised as a significant element of alignment within the university. Indeed, the empirical findings demonstrate that knowledge combination processes within a single university organisation were regularly impossible or very difficult to reach. It cannot be assumed that different departments/actors and their diverse frames of reference add up to one single, strategic vision or contribution. Therefore, a second transformative knowledge circuit between the different university stakeholders—in which shared actionable knowledge is created within the university—can alleviate these tensions (Figure 16).

This element of internal alignment highlights a significant shortcoming of Goddard and Chatterton (2003) view of universities as strategic "integrators". Indeed, we claim that universities cannot simply strategically integrate because there are different views even within the university that are irreconcilable simply because people look differently at regional partners, activities and goals. We identify three types of potential university knowledge fissures that make the internal knowledge circuit and alignment very difficult to reach. First, knowledge fissures between the strategic centre/senior leadership and the rest of the university might hinder the production of shared actionable knowledge. Further, absent alignment between the different academic departments/groups serves as the second internal knowledge fissure. Finally, problems may arise when service/functional departments and academic departments do not align. We reinforce the view that the departments and their institutional entrepreneurs are the engines of agency and thus emphasise the extreme importance of this second alignment circuit.

First, internal **divergences appeared between the strategic centre and the rest** of the university. This type of absent alignment became evident in Chapter 9, with academics being strategically involved in regional strategies based on their own capacities or interests, and these were not always based on the priorities of the university's strategic leaders. As we outlined in Section 10.1.3, this alignment—created through the internal knowledge circuit between managerial leadership and the academics—was found to be highly relevant for establishing managers' credibility/plausibility when participating in and advancing RICs. We also identified that the informal connections between engaged actors (academics with regional counterparts) almost always gave rise to more continuous forms of interaction (Chapter 9). The relevant actors were able to unlock impasses, which resulted in wider— often unexpected—benefits. Thus, when informal connections at the functional level were blocked by the strategic level, this was often due to a missing learning or knowledge circuit, and accordingly, such a disruption hindered the production of a shared actionable knowledge base.

The second hindrance of alignment is a missing learning circuit **between academic departments**, resulting in the lack of a shared actionable knowledge

base. In our empirical findings, we observed that different departments were often unable to share/exchange their knowledge, and that their divergent interests and frames of reference resulted in different notions regarding what should be achieved regionally. This challenge emerged in the case of the Creative Science Park of Aveiro (Chapter 8), where individual academics from the Department of Social, Political & Territorial Sciences, the Department of Environment & Planning and the Department of Biology did not align and thus were unable to withstand external pressures (such as the disruptive opposition of an environmental organisation). We see that it is not straightforward for departments within a university to agree on the foci of regional collaboration, and that decisions made at one moment in time do not always allow for the possibility to forecast the benefits or costs they might result in.

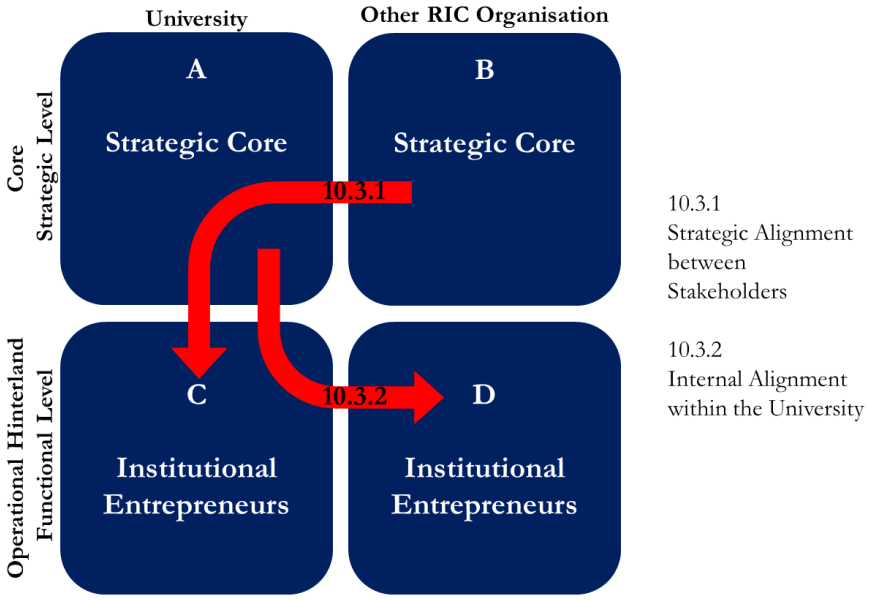
Finally, absent alignment **between service/functional departments and academic departments** turned out to be a hindrance for the internal transformative circuit and thereby also inhibited the creation of a shared actionable internal knowledge base. In Chapter 5, this came to the fore within the case of the Fraunhofer Project Centre in Twente. Here, the service department of "Campus & Facility Management"— responsible for allocating and charging for university floor space—was impeding and delaying the smooth development of the FPC, which had been initiated and promoted by individuals within the Faculty of Engineering Technology.

10.3.3 The double knowledge circuits of alignment

For successful alignment, there need to be two constructive, creative, innovative and transformative learning circuits that allow for the production of actionable knowledge. One dimension in terms of the production of this knowledge base relates to strategic alignment between stakeholders, and the second element is internal alignment within the university (Figure 17). If the creation of shared actionable knowledge and alignment are achieved through these two circuits, we can assume that IEs will be likely to find the best conditions to enact agency and channel leadership in RICs to fill the functional and institutional gaps in their regions (see Literature Review, Section 2.2.4 & 2.3.5).

Knowing that the two learning circuits are not easily activated but instead constitute a complicated endeavour, the creation of an actionable, transformational regional knowledge base is a result that is not effortlessly attained. Nevertheless, all too often, these endeavours are treated as a straightforward, bureaucratic and superficial learning process, when in fact they need to be constructive, transformative and creative. We were able to demonstrate that the two learning circuits are not just concerned with "translating" between codified/tacit or internal/external knowledge; instead, what is happening in these circuits is more of a domain shift and transference between people with different understandings, priorities and frames of reference. On top of that, it is especially significant that if a regional actionable knowledge base is to be created, it has to happen through both circuits.

FIGURE 17. THE TWO KNOWLEDGE CIRCUITS OF ALIGNMENT



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10.4 Aligned agency approaches

We identify the ultimate goal as the production of a shared actionable knowledge base antecedent to action, which goes beyond simply moving knowledge from one partner to the other and is greater than the sum of its parts. Indeed, it is *that* new and combined actionable knowledge base created between partners of regional innovation coalitions that allows them to initiate path development activities and drive knowledge-based growth. When these activities are based on the shared actionable knowledge, they are grounded in the region and consider the stakeholders, their capacities, knowledge and resources. Thus, coalitions that have created actionable knowledge can base their collective actions on it and thereby may affect regional development trajectories.

To understand how this goal can be effectively reached, we have considered the tension-laden architecture (Figure 13 & Figure 14) in which IEs can be either empowered or obstructed by their organisation's leaders. This relationship is shaped by the leaders leveraging IE activities in order to gain credibility/plausibility for their actions with regional partners (possibly in RICs). Within this same architecture, we also considered enablers and constraints for agency as being bound to strategic/functional as well as hierarchical/inter-organisational relationships. We have thus examined the complex internal dynamics of these coalitions and the elements that affect the architecture they are set in.

The elements that hold this architecture together are the two interactive learning and knowledge circuits through which actors combine, transfer and absorb each other's knowledge. The first circuit emerges between regional partners (Figure 15), while the second involves the different stakeholders within the university (Figure 16). These circuits are complex processes, shaped by the tensions within the architecture and those between partners and/or individuals. A shared actionable knowledge base for a region is thus the result of the two circuits of alignment (Figure 17) that stakeholders need to manoeuvre while navigating though the architecture fraught with tension.

What has emerged as critical to achieving the shared actionable knowledge base

is alignment around/for agency as it specifically empowers IEs to fill institutional gaps. We have focused on the role that universities play in this setting by looking at IEs at the university level. Thus, rather than seeking just to activate agency randomly, positive effects/outcomes appear to occur when there is an alignment in the system around agency, in which strategic intentions are coupled with functional knowledge exchange. Thus, it is this characteristic of alignment that can make a difference within this complex architecture that is held together by the two interactive learning and knowledge circuits.

We have perceived a conceptual structure that we term "aligned agency"' as strikingly important, and we therefore criticised activated agency approaches (Chapter 2.3) in that they ignore the tensions that can possibly be resolved by alignment. Thus, what have been called *activated* agency approaches in the beginning of this thesis should be reconceptualised as *aligned* agency. The output of an aligned agency approach can consequently lead the four actors (functional and strategic, and university and external) to interrelate successfully and create shared actionable knowledge bases. Thus, regional path development through the activities of IEs and RICs seems to depend on the dynamic interaction between collective regional knowledge processes (the two circuits) and individual actors, with the ultimate goal of creating shared actionable knowledge.

The black box this thesis is trying to open up concerns the regional innovation coalition and the collective actions that may have the potential to facilitate path development. The findings reveal a complex picture of these coalitions, with its currency being knowledge as well as credibility/plausibility; both are achieved externally and internally through *alignment*. More specifically, we have looked at universities and the way their leaders are able to support and leverage functional knowledge linkages with regional partners by using that credibility/plausibility to build collective activities that strengthen the regional innovation environment. At the same time, the processes of aligned agency can have empowering effects and thereby improve the contributions that IEs can make. Thus, the output of the complex setting we have outlined here is the *detailed architecture of an aligned coalition*, which is capable of producing a shared actionable knowledge base that has the potential to strengthen the regional innovation environment.

11 CONCLUSION

This thesis has been concerned with the oversimplification of regional innovation policies being driven by regional actors (Section 1.1) and the role of universities in partnerships that are tasked with transforming these policies into new regional futures (Section 1.2). Our diagnosis of this problematisation was that the key issue is one of institutional rigidity (Section 2.1), and we argued that universities could contribute to resolving institutional rigidity through institutional entrepreneurship (Section 2.2). In order to analyse this tension, we posed an operational research question as well as three sub-questions (Section 2.3). In the following, we will fit the stylised facts and findings (Chapter 10) into the conceptual architecture (as developed in Section 2.3) and directly answer the research questions (Section 11.1). Subsequently, we will propose a new model on that basis of the concepts, relations and dynamics that we have observed, and then re-insert those findings into the literature (Section 11.2).

11.1 Key results

The first sub-question was as follows: *How does strategy making function in RIIBAs?* We observed that while strategy making is intended to guide and coordinate, it becomes a site for various mismatches, postponements and confusion between the RIIBA partners (Chapter 8). The strategic process can be delineating and separating; it can disclose mismatches between partners, who may get caught in internal political dynamics which are often used to postpone activities (as an empty signifier function). Accordingly, the current view that a strategy is easily proposed and implemented is not realistic. By focusing on the role of universities in these strategies, we have found that we cannot "just" look at the strategies themselves; instead, we must tease out what universities do for/within them as they engage in processes at the strategic and operational levels (Chapter 9). In Chapter 4, we also observed that the most effective coupling can be obtained when there is a kind of ongoing effectual process of strategy making rather than a more rigid course. Thus, while mismatches do arise, they can effectively be

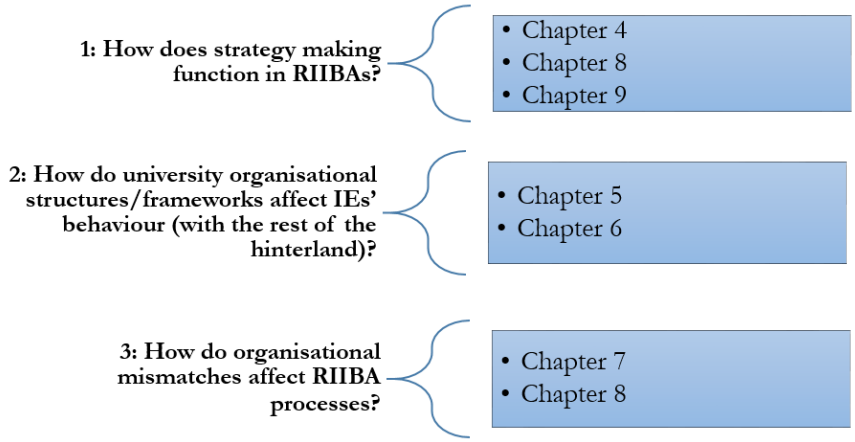
addressed where there is an effectual coupling.

The second sub-question was as follows: *How do university organisational structures/frameworks affect IEs' behaviour (with the rest of the hinterland)?* We saw that the interaction between university IEs and other IEs is heavily influenced by the degrees of freedom/autonomy they are granted by their universities. In Chapters 5 and 6, we saw that internally, the university core and the university stakeholders need to be aligned so that the credibility/plausibility of the core (A) in RIIBAs is derived from the capacity provided by the hinterland (C) and the extent to which they understand it. Therefore, the IEs in RIIBAs are affected by the extent to which A and C are aligned without unduly constraining their autonomy. At the same time, the organisational structures need to offer a framework within which institutional entrepreneurs can act freely with regional partners.

Finally, the third sub-question asked the following: *How do organisational mismatches affect RIIBA processes?* In the empirical chapters, we were able to observe the mismatches (Chapters 7 & 8) foregrounding the fact that universities' regional partners often show high levels of frustration with universities, followed by hostile/uncooperative behaviour as they do not understand the mismatches. The strategic core of external partners (B) were found to have assigned bad motives to the university's strategic core (A) because of mismatches between the institutional entrepreneurs (C & D).

These mismatches at the level of the operational hinterland can have consequences for the strategic core which are not always proportionate; just because two individuals (such as an academic and an employee of a municipality) cannot work with each other, this does not mean the university as a whole cannot work with the municipality. We observed a focus on the core as well as an upscaling from the operational hinterland to the strategic core as a reification of the inconvenience for the unwilling. The mismatches affected RIIBA processes when there was no resolution for them within the RIIBAs, and consequently, RIIBAs were not able to support network and institution building activities.

FIGURE 18. MAIN CONTRIBUTIONS OF THE EMPIRICAL CHAPTERS TO ANSWERING THE SUB-QUESTIONS



SOURCE: AUTHOR'S OWN ELABORATION

On the basis of the cross-case discussion (Chapter 10) and the answers to the sub-questions, we now turn to the main research question: *How and under which conditions can institutional entrepreneurs of universities address institutional rigidities in peripheral regions?* To answer this question, we propose a new—potentially operative—model. We cannot establish that this model exists, but under the auspices of critical realism, it is legitimate to believe that we have indeed perceived something new. We are thus sketching a mechanism capable of describing the relevant processes in a way that has not been done before. In Chapter 10, we determined that two knowledge circuits (Figure 17) are necessary in order for the regional partners—at both the functional and strategic level—to align and create a new combined actionable knowledge base. These alignment circuits can potentially occur at two levels: (1) between the regional partners and (2) between the stakeholders within the university.

Consequently, alignment around/for agency can make a difference within this complex setting by empowering university institutional entrepreneurs to address institutional rigidities. If alignment within the two knowledge circles happens, the activities undertaken in the RIIBAs can result in a thickening of the institutional environment. Thus, when conceptualising the role that policy plays within this

system, we can see that alignment and these knowledge circles are necessary conditions for policy to contribute to positive path development. While alignment might not drive path development itself, there is no chance for policy to contribute to path development if alignment is not antecedent. Accordingly, institutional entrepreneurs can address institutional rigidities when they are autonomous and empowered in their actions, aligned with their strategies and partners at different levels, and when they use the provided autonomy to exercise the organisational capacity to create action spaces in its structures.

Having given this general answer to the research question, we will now explain how the thesis contributes to the debate on evolutionary economic geography (11.2). Subsequently, we discuss the implications for policy that can be derived from this analysis (11.3), sketch the limitations of this thesis and lay out the directions for further research (11.4).

11.2 Contribution to theory and literature

In the introduction, we have highlighted that there has been a tendency over the last few decades to rapidly introduce new concepts and theories without testing them empirically. This incautious speed of developing new concepts and theories has hindered researchers and policy makers alike from fully understanding the established concepts and empirical reality before new concepts were introduced. What we have seen in this thesis, though, is that when one starts to "get into the reality", many of the apparently singular concepts cannot be explained individually; instead, they have to be looked at in an interrelated way.

In what follows, we will highlight the multi-disciplinarity of this research and the different conceptual elements (such as agency, leadership and institutions) that were integrated. We show how these different concepts and theories were combined and suggest that the field of regional studies would benefit from more integrative work of this type. Thus, we maintain that there is immense value in weaving different fields and fragmented, cognate concepts together before creating new theories/concepts, as this bears great potential for developing a better understanding of regions and their development.

11.2.1 Contributions to theory and literature on regional development and innovation policy

Our first contribution is to indicate that the extant debates around regional innovation policies have made an error of oversimplification in their treatment of the multi-stakeholder processes involved in path development. The difficulties in managing regional innovation assets through networks have been wildly underestimated; thus, our conceptual contribution is to provide a framework for understanding this complexity without making it seem more complicated.

Hence, while many have called for the creation of "successful partnerships" (OECD, 2006), the reality is that they are not so easy to achieve, and the agents involved in these processes are not activated in simplistic ways. This research suggests that the very process of activating agency is complicated, and that there has been insufficient consideration of this complexity. Indeed, the different activated agency approaches that have been introduced in the past have taken the issue of activating agency far too lightly. The IEs active in a region are shaped by a range of contexts which are not just organisational or operational; they are shaped by the complex interplays between the two. For theory, this means that the overall logic of these activated agency fora is not singular; instead, there are multiple logics at play, including a range of different institutional logics and operational logics. This finding stands in contrast to the tendency to assume that operational logics will follow strategic desires and designs, and that simply aligning organisational intentionality is enough to align operational interoperability.

This argument of theories being framed in an almost stepwise fashion also chimes with our argument of effectuality insofar as decision making is thought to done in dynamic and instable environments. Thus, constantly looking to take the next best, predefined step is clearly a function of causal rationality. This allows us to make the point that there is a classic/implicit causal rationality in our current regional innovation policy theory. Stepwise processes are thus the result of misguided framing, and we argue that in reality, stakeholder processes (such as the entrepreneurial discovery process) are ultimately trying to take on an effectual logic (in that they are steering the process as things go on) while being

"hammered into" a causal logic (by being pressured to follow the predefined steps).

This thesis also advances regional innovation policy theory by empirically demonstrating the validity of reasons that can explain why this oversimplification has taken place. There is an inherent instability to the processes described; they are dynamic and unstable while some of the established theories frame them as almost stepwise (Foray *et al.*, 2012; OECD, 2010). The key point is that the search for stability is futile because of an inherent dynamism. This dynamic instability is driven by the fact that the involved actors—certainly those in universities, but possibly also those of other organisations—are conditioned both by their organisational context but also by their operational context. Everybody is thus influenced by these two contexts. Additionally, actors in the core are conditioned by a set of non-regional considerations (and universities are driven by a whole set of extra-local polices).

We speculate that another reason for the tendency to oversimplify theories and introduce stepwise instructions is that there has been a predisposition to focus on successful core regions (Eder, 2019) and attribute their success to their institutional behaviour. Thus, there is a tendency to follow those "best practice" story lines—often narrated in a stepwise logic—which are then assigned a rather problematic causal meaning. This suggests that much greater attention is needed not just to peripheral regions, but to all kinds of sub-optimal innovation environments. Furthermore, more emphasis needs to be placed on the positivity of the periphery instead of focusing on all the things that are complicated and unsuccessful in those environments.

Contribution to particular concepts within EEG

In Chapter 1, we argued that theories are being developed too fast without sufficient testing and/or empirical application. In contrast, it has taken three years to explore and actually reflect upon the various theories/concepts at play in this thesis. In light of the achievement of the present work, we maintain that an even more serious in-depth deliberation of these issues is urgently necessary to advance our field. Just scrolling through the first chapters of the most recent

"Handbook of regions and competiveness" (Huggins & Thompson, 2017) can give any reader the idea of the enormous number of new concepts and theories that have appeared over the past few decades. Nevertheless, there is now the recognition that more integrative work is required; consider, for instance, a special issue on "growth and change" (Schmutzler, Pugh, & Tsvetkova, *forthcoming*). Such an adaptive approach is needed instead of "simply" producing new concepts through speculation on the basis of relatively thin, idiographic examples.

Another contribution of this thesis is the improvement of the theory/concepts that are already "out there" through application to concrete cases. There are currently a range of conceptual challenges that the field faces, but many researchers appear to be trying to solve them through a process of intense theorising. This thesis suggests that the answers are likely to have empirical referents; thus, it is crucial to sort out the theories, identify the conditions under which particular theories apply and create better conceptual frameworks. If theorists actually started nuancing concepts instead of immediately creating new (and not necessarily better) ones, many of which are then expressed as absolutely vital to understanding regional development, we could work to resolve some of the open conceptual challenges. There has been a high level of theoretical fertility, but at the mid-level, there is some theoretical barrenness, and many theories have not moved on the way scholars had hoped. Thus, by conducting an exploratory study, we have considered how agency, institutions and leadership operate together in complex ways and thereby addressed these concerns about abstract theorizing by starting from the ground up with empirical analysis.

Agency

Recently, researchers within EEG have been calling for a greater focus on and analysis of agency (Grillitsch & Sotarauta, 2019; Uyarra, Flanagan, Magro, Wilson, & Sotarauta, 2017), highlighting the need for a better understanding of how actors gain agency and contribute to the change and creation of institutions. This thesis confirms that the call to consider agency has thus far been taken too lightly, of which a natural consequence is to foreground agency even more. In

considering this issue, this thesis has shown that the debate around agency in regional innovation is simply a recurrence of the problem of theory moving too fast.

By adding to the literature on micro-scale agent behaviour and the resultant dynamics of regional innovation coalitions, this thesis takes a further step towards clarifying the role that agency plays in the development of new regional paths and trajectories. It is the IEs that thus become crucial agents in gathering and mobilising resources to develop new paths and escape the circumstances of institutional rigidity.

An additional contribution is that of formulating a methodological problem in the study of agency (a challenge that has recently also been recognised by Grillitsch, Rekers, and Sotarauta (*forthcoming*)). We claim that there is need to look at knowledge processes in the longer-term by considering the competing forms of understanding within regional innovation processes. In knowledge combination and innovation processes, agency itself is only revealed in later stages of the process and cannot simply be claimed by the involved stakeholders. Thus, more reflection is needed on how to methodologically analyse agency (see Section 8.6 for details).

Institutions

Regional innovation theory has mostly focused on institutionally thick regions (Moodysson, Trippl, & Zukauskaite, 2015), at times neglecting regional and institutional diversity as well as regional disparities. We thus add to the literature on institutionally thin regions by arguing against the view that these regions are unable to change their institutional thinness and respond to regional development (McCann & Ortega-Argilés, 2016; Rodríguez-Pose & Wilkie, 2017). In contrast, we empirically demonstrate that the process of institution building—although certainly not an easy one—can be taken up in peripheral and institutionally thin regions. In addressing this institutional thinness, what we might putatively think of as institutional thickening is associated with processes that involve a dynamic between regional stakeholders at different levels (core and peripheral) in which actionable regional policy knowledges are combined, aligned

and attuned.

Thus, we find that when regional actors are aligned, institutional entrepreneurs can potentially build, change and/or adjust institutions. Institutions can thus be understood as the regularities that guide common outcomes, emerging at the end of a process in which the different organisations manoeuvre themselves into position. Thus, the different actors are "moving around" and being pulled in different directions, and the institutions emerge at moments of concurrence. These moments in conjunction with the fact that an IE can create/adjust institutions might seem coincidental, but they can work this way only because of a whole set of processes that have led up to this arrangement.

We also advance the existing conception of IEs as key individuals/groups of individuals who can delegitimise existing institutional arrangements and create new ones (Battilana, Leca, & Boxenbaum, 2009). According to the model of alignment (Figure 17), IEs can create and adjust institutions only when embedded in this model and empowered within the complex architecture they operate within. While institutions emerge at moments of concurrence between actors and organisations, these moments might not be fully predictable, and the process of institutional entrepreneurship may therefore not be as conscious as originally claimed (Grillitsch & Sotarauta, 2019).

Regional leadership

A rising number of contributions to regional leadership discourse have highlighted that more consideration needs to be given to emergent leadership (Beer et al., 2019; Bennett, Wise, Woods, & Harvey, 2003). This has been confirmed in this study insofar as real flexibility and leadership were provided by IEs—below the level of senior leaders—who were able to mobilise and extend their networks and construct promising projects for their respective regions. Thus, the capacity of the core/strategic layer to embody what the literature sees as being strategic or managerial leadership roles ("held by an individual in a hierarchical top-down organisational setting" (Gibney, Copeland, & Murie, 2009, p. 12)) is actually created by individuals at the operational level. Our contribution is in line with the findings of Grillitsch and Sotarauta (2019), who have

highlighted that regional leadership is enacted by "agents who work to determine the direction for change through, with and by other actors" and not by "fallacious heroic leaders" (p. 9). Emergent leadership thus seems to be a "tricky" way of referring to operational leaders.

Additionally, we empirically established that institutional entrepreneurs—as agents that enact regional leadership below the strategic core—go beyond their own interests or the interest of their organisations and "beyond the short-termism of performance goals, the 'statutory' and the 'contractual'" (Gibney, Copeland, & Murie, 2009, p. 9). This "going beyond" appears to be a complicated endeavour in organisations that have different capacities that might not simply and straightforwardly align. Whether this "going beyond" can be expected from strategic leaders (from the core of the organisations) is rather questionable, as their main task is to represent their organisations and act in their interests (therefore potentially restraining them). These points are critical for future work on leadership.

11.2.2 Contribution to theory and literature on universities in regional development

This thesis has demonstrated that the university, often "simply" considered as an important knowledge provider, is in reality a complex and messy actor in regional development processes. Thus, claiming that universities can be/become regional "integrators" (Goddard & Chatterton, 2003) or "builders" of innovation systems (Caniëls & van den Bosch, 2011) seems to be another oversimplification. Similarly— and without doubt urged by politicians and policy makers—researchers and politicians have proposed oversimplified, stepwise processes that offer a simplistic recipe for how universities can contribute to regional economic development (see, for instance, European Commission, 2011). This thesis adds to the literature on universities in regional development by calling for a reconceptualisation of our understanding of universities and the role that they can play in regions.

This rethinking needs to reflect their situation as complex actors with multiple roles who are prone to knowledge fissures that may create problems within an

organisation but also elsewhere (in the RIC). These knowledge fissures mainly arise due to pressures or expectations from outside the region (e.g., from national research policies or international mobility policies), constituting new priorities that universities then must follow. Therefore, these fissures create tensions with the regional priorities and interests that are often not related to the external pressures. University core/senior managers must thus "promise" activities to regional partners (such as municipalities or SMEs), and the hinterland/operational actors are often not able follow up on these commitments.

Universities only recently shifted into the focus of the regional leadership and agency discourse (Benneworth, Pinheiro, & Karlsen, 2017; Pinheiro & Normann, 2017; Raagmaa & Keerberg, 2017). This thesis thus contributes to the anticipated trend by analysing how universities' exertion of strategic leadership and agency is influenced by their internal dynamics and assets, which in return shape their regional contributions. We claim that we need to think differently about the impact that university architectures can have on leadership and agency, and thus on regional cooperation and engagement.

While there is an inclination to think that the strategic core/senior managers are in control, we have shown that there is a mutually constructive synergy between the university core and the hinterland, and that university internal dynamics are directly related to the actions of the operational core. Clark (1998) had already pointed in this direction by introducing activated academics that are put alongside a strong steering centre. Nevertheless, in this setting, it appears as if the academics are steered by the centre, whereas we have indicated the contrary. Indeed, it is the academics who create the opportunities for managers to steer, which they do not do in a void, but they only do so within these complex environments that are shaped by the institutions that they are a part of, the knowledge processes they are involved in and the relationships they have with partners.

We see a three-way interrelatedness/dependency here: The core creates the conditions for IEs (1), who then might choose to act upon those conditions (2),

which the steering core may then use to claim credibility/plausibility for its activities (3). Nevertheless, this mechanism does not seem to be working, and institutional architectures are often used as a means for the core to impose their will upon academic agents.

While this level of complexity is a fundamental characteristic of universities, this thesis has focused on the building blocks of innovation policies. It is the prospective nature of regional innovation policy that leads to a situation in which universities make big promises and are expected to contribute extensively. However, we can see from our model that they are not necessarily equipped to deliver on them. What does indeed equip them to deliver are the IEs, entrenched in a setting that allows them to participate and engage. Therefore, there is a need for more retrospective consideration of incremental upscaling.

11.3 Implications for practice

The results discussed can be directly linked to potential changes in practice for (regional) policy makers and actors within universities. Our research demonstrates the shortcomings of the policy concepts and models that reduce university contributions to a set of sequential steps. Approaches such as smart specialisation or constructed regional advantage have too often been simplified and broken down into stepwise designs and implementation processes; examples of such reductive efforts include the "six-step guide" to smart specialisation (Foray et al., 2012) or the "four step guideline" for regions to become enablers of change (OECD, 2011). This contribution advances recent developments in the literature highlighting that there is no optimal "guide" to create and implement policies in a universally accepted way (McCann & Ortega-Argilés, 2015), and that regions—as well as their organisations and the individuals within those organisations—have to "find" their own approach.

In addition, we have found that **regional policy** has an important role to play in the regional entrepreneurial ecosystem. Thus, regional policy makers need to find (new and better) ways to empower regional change makers (people who are doing things that can be understood as acts of institutional entrepreneurship) and

encourage the alignment of interests between regional partners as well as within organisations. A first step would be to create activities, programmes or initiatives that allow for individuals to get to know each other and enhance the understanding regional actors have of each other's similarities, differences and interests (see also Kempton, 2015). This is particularly important because if stakeholders do not know how to work with each other, regional strategy processes might effectively become mainly concerned with stakeholders learning to cooperate instead of generating regional development activities/potentials (European Commission, 2017).

Additionally, policy makers need to find ways to identify, empower and mobilise change agents in universities but also in other regional organisations. When the change agents are identified, there is a need to find a balance between the encouragement and discouragement of those actors, with the aim of reducing the tensions within the complex institutional environment. While there is a limit in terms of what regional policy can do in order to encourage or discourage those change agents—of course, they cannot change European research policy—this thesis has identified different ways for policy makers to support (university) change makers (Table 20).

TABLE 20. POTENTIAL POLICY INTERVENTIONS TO BETTER SUPPORT UNIVERSITY INSTITUTIONAL ENTREPRENEURS

Supporting encouragement of change agents	**Addressing discouragement of change agents**
Create an apparatus that allows academics to translate intangible ideas into deliverable, tangible outcomes.	Secure long-term frameworks by demanding that institutions sign up for long-term planning periods.
Create opportunity spaces for regional stakeholders to co-create and test ideas.	Encourage the creation of "test spaces" in institutions to check whether/how new institutional settings could work.
Continue providing support even through complicated phases as the partners might need some time to re-focus.	Target the regional and international stakeholders and create opportunities to combine their knowledge, interest and aims.

SOURCE: NIETH AND BENNEWORTH (2019), CHAPTER 5 OF THIS THESIS

In terms of value signalling and the co-creation of ideas and projects, regional policy could develop a mechanism/apparatus that links academics with intangible ideas to potential beneficiaries who could signal their potential value in a tangible

project. This is particularly important as it gives regional partners the opportunity to signal that the academic's ideas are valuable and important and that regional partners are interested in the joint creation of projects. Additionally, this helps to create common ground between academics and regional partners, and to authorise and justify those projects internally. This in turn allows academics to mobilise internal support. Regional policies should support regional stakeholders through difficult phases, as the constellation of engaged partners might change and new stakeholders— together with the still central IEs—might require additional time. While it is inevitable that the constellation of partners will shift during projects, there is a need to ensure that policies do not abruptly withdraw support and the credibility of IEs remains intact, as such changes have a general undermining effect on engagement as an academic activity.[16]

In terms of the need for IEs to plan in the long-term, regional policy should encourage universities not to continuously change priorities and instead support long-term trajectories. We have noted that academics can become demotivated when internal strategic frameworks and university priorities are constantly shifted. Regional policy should seek to persuade universities to commit to engagement frameworks for a long-term period, providing IEs with more reasonable timeframes to actually initiate, continue and embed change. Second, regional policies should encourage universities and other institutions to become more flexible in terms of testing new institutional setups. This could give IEs the opportunity to test their projects and find a suitable setting in which they can flourish. Finally, regional policy needs to stimulate institutional entrepreneurs to build broader international connections that are relevant for the regional stakeholders. This is possible by enabling universities to attract international knowledge and to translate as well as embed this knowledge within the context of regional needs. Policy has to work on both sides (the international and local). A key challenge here for regional policy makers is understanding the correct balance of fundamental research, which is necessary to create the global pipelines, and to ensure that globally active academics can be coupled with regional partners

[16] This section has appeared in Nieth and Benneworth (2019), Chapter 5 of this thesis.

to deploy that global knowledge to create local buzz.[16]

An additional implication for policy arising from this thesis is a clear need for more evaluation of regional policies and strategies. Up until this moment, there has been a tendency to regard policies and strategies throughout the journey of implementation without paying enough attention to the ways in which they can be evaluated. This is also in line with the black hole argument presented throughout this thesis implicitly suggesting that evaluation seems to not to be taking place. While there is clearly a learning cycle that places must go through, the missing element still seems to be that of thorough evaluation and reflection. When evaluation does take place, it appears to be limited to technical considerations as opposed to assessment of the formative learning process. The role of universities should include taking part in such evaluation processes together with regional stakeholders (Chapter 9).

The findings of this thesis could also be of interest to **universities (as policy makers)** in that they could help them understand how to create structures that allow institutional entrepreneurs to enact their regional roles. Facilitating internal alignment processes (Figure 16) could thus support university-regional engagement. Through supporting the bottom-up agency of university IEs, credibility/plausibility for university managers is created, and the strategic regional leadership role they are able to play is enhanced. This in return can optimise their university's contributions to innovation-led regional development. Thus, university managers and leaders need to find ways to not only support but also protect their academic agents from diverse pressures to ensure they are able to exert regional agency. Additionally, university managers need to identify what authentic strengths their engaged staff have and connect them with regional policy makers to facilitate better integration with other regional partners' capacities. This is a crucial step if universities want to be seen as legitimate partners in regional innovation policy process.

11.4 Limitations and future work

We will now discuss a number of limitations of this project and then turn to some

considerations for future work within the field. First, and as already introduced in Chapter 3, there were some methodological limitations in that the PhD researcher was embedded in the research as an employee of the Regio Twente. Thus, the researcher had to find alternative ways to enact reflection and additionally had to be at some point removed from the embedded context of the fieldwork. This was achieved through active engagement with the academic community and facilitated though the researcher's extensive scholarly network. The process of active reflection was necessary to avoid getting too close to the research subject. Moreover, we have dealt with this issue through aggregation by using stylised actors and not releasing the names of institutions or of particular people and their activities. This can be observed in the way that we talk about an actor or IE in a kind of synthetic model.

Second, there are some themes and concepts that were neither explored nor followed up on in the creation of the theoretical framework. Among others, these include conceptual considerations of power, legitimacy (as the term is used in Chapter 6) and trust. Thus, when these terms do occur throughout the thesis, they were meant to be purely vernacular, and we were not resting any conceptual claims upon them. Instead, we chose to deliberately silence these elements—or have used them in a non-conceptualising way throughout this thesis—in order to avoid diverting attention away from the actual focus and the established framework.

The third point is ontological and related to critical realism. The cycle of the critical realist research process is completed by proposing new theoretical structures (Chapter 10) that have been empirically observed or inspired. In that sense, we cannot accord them the full weight of theory as they are a starting point for further study. Thus, while in our conclusion (Chapter 11) we made a series of theoretical contributions, we acknowledge that there might be a lack of ontological closure. In effect, our conclusions constitute a starting point for another cycle of enquiry even though they appear to be definitive.

In light of the scientific and practical contributions of these last sections, we would also like to briefly outline some avenues for future research. One area

where we can see great potential is that of further researching the role of IEs. First, even though we have prioritised examining agency and leadership in the university sector, we have seen examples of individuals who appeared to also be engaging in institutional entrepreneurship within other regional organisations[17] (such as municipalities or companies). Thus, while definite conclusions in this thesis may be restricted to the case of universities, further research could be conducted on the IEs of other regional organisations as well as the interplay between them. There is no logical reason why they would not be found in other organisations, and this thus constitutes an interesting field for further research. An illustration of this type of interest can be seen in the recent study by Döringer (2019) on the role of entrepreneurial individuals in local and regional governance structures.

Second, what we would want to do in part to extend the bounded scope of this research is to focus on IEs and their individual characteristics as well as the preconditions for successful engagement. Thus, we wonder if university IEs who have worked outside the university context have an advantage when "dealing with the outside world" as university employees. For instance, if an academic (conceptualised as an IE in this thesis) has worked in a municipality before or has a dual appointment, can s/he better understand and connect with both sides? Or, if a university manager has founded her own company before, is s/he more suited to manage successful university-regional engagement activities? These two examples are possibilities that we were able to recognise within the data, but we had neither the room nor the time within this thesis to develop these assumptions any further.

[17] Interview partners: TE17, TE18, AE02, AE20 and AAE06.

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ANNEX I: THE UNIVERSITY, THE REGION AND NON-ANALYTIC CONCEPTS

A **university** is a range of different institutions that all have the commonality that they couple a pedagogic process with a knowledge generation process. The term is shorthand for a variety of higher education institutions in which there are various communities of active knowledge creators and active teachers. These might have the formal name of universities, but they might also be called colleges, polytechnics or regional consortia, to list a few possible examples.

In this thesis, we understand **regions** not as predefined administrative units, but as territorial contexts within which local organisations and actors move and conduct the activities that we are interested in. For more details on this approach, see Grillitsch and Sotarauta (2019, p. 16)[18]—referring amongst others to Boschma (2004)[19]—when describing regions as "no fixed, predefined entities [but instead as] the relevant territorial context [which can only be unveiled empirically]".

The following is a set of terms used in this thesis that have no analytic capacity and are thus not used to express the logical structure of objects, relationships and dynamics. For the avoidance of doubt, the concepts that we are not evoking in this thesis are: trust, legitimacy, power and performance.

These terms are not used conceptually, and we are not making any theoretical claims upon them. Thus, when they do occur, they are used only as descriptive nouns and purely in the vernacular sense (also see Section 11.3 for details).

[18] Grillitsch, M., & Sotarauta, M. (2019). Trinity of change agency, regional development paths and opportunity spaces. *Progress in Human Geography*.
[19] Boschma, R. (2004). Competitiveness of regions from an evolutionary perspective. *Regional Studies*, *38*, 1001-1014.

ANNEX II: OVERALL INTERVIEW GUIDE[20]

1. Could you tell me a little about your career? What brought you to *(insert institution)* and your current role(s)?

The role of the university in the region

2. What role does the university *(insert name)* play in the regional innovation ecosystem?
3. In which areas do regional actors expect a contribution of the university to regional development?
4. In your experience, who is taking the initiative in joint university-region activities?

4.1. The university or regional actors? Which actors? / If the University: Departments or individuals?

The role of the university in innovation policy

5. Do you consider the university to play an active role in the innovation policy /strategy process?
6. Do you believe they are given the space to shape regional innovation policy / strategy design?
7. What can universities bring to this innovation policy/strategy processes?

The regional strategy *(Insert name)*

8. What is the role of the (*regional strategy*) for the region according to you? Where would the region be without it?
9. Who designed the strategy? How did the involved parties arrive at the strategic visions?
10. What were the challenges in the strategy formulation process? (E.g. short-term versus long-term planning)

The University *(insert name)* in the regional strategy & strategic initiatives

11. What role (if any) has the university played in the regional strategy / strategic initiatives?
12. Was the University engaged in the elaboration, implementation, and/or evaluation stages?

[20] This overall guide represents an overview of some the questions and themes that were introduced in the interviews. The precise interview guides were adapted to the individual cases, regions, organisations, interview partners, etc.

12.1. If yes, who and under which conditions?

Project Level

13. Can you tell me about some concrete projects where the UT is involved as a partner?
13.1. Could you specify a few of the most successful projects together with the UT? What were the success factors? Who was involved?
13.2. And some of the least successful ones? What were the problems/challenges? Who was involved?
14. How were joint projects/activities initiated, selected and implemented in the past? By whom?
15. What are the kind of projects that you would want to mobilize / where you would see input from the university as being important?
16. In your opinion, what is the driving force behind the involvement of the UT?
17. What do you hope the university would do? / What should the university be doing differently?

Common vision building

18. How did the different actors of a project/activity come up with a common vision?
18.1. What where potential problems in the joint vision building process?
19. What do you hope the university would do? / What should the university be doing differently?

Future

20. Is there a joint vision for the future of the region?
21. Are there any particular challenges that you can identify for the interaction between the university and regional partners?

ANNEX III: SUMMARY AND SAMENVATING

It takes two sides to build a bridge - Universities as institutional entrepreneurs in knowledge-based regional development

There is a widespread assumption amongst regional policy makers and practitioners that successful innovation policies are dependent upon place leadership from coalitions of actors. These coalitions—consisting of actors from different organisations such as regional authorities, companies or universities—are assumed to work together seamlessly and develop as well as enact collective innovation agendas that ultimately lead to regional (path) development. One important actor and contributor to these coalitions is the university due to its key role as a knowledge producer and distributor. However, universities are complex organisations that lack strong singular strategic interests, which raises the prima facie doubt of whether they can contribute in the way(s) that innovation policies expect. In failing to consider this complexity, scholars and policy makers ignore the reality that universities are often not equipped for coordinated action around their knowledge production and circulation.

In this dissertation, I address this urgent gap of understanding by asking the following research question: How do universities act as institutional actors in regional innovation policy arenas? I analyse how the organisational dynamics and particularities of universities influence their participation in these regional coalitions and their contributions to collective regional innovation policy processes. More specifically, I focus on the acts of institutional entrepreneurship of university employees that can have more structural effects and thereby address the institutional thinness of places such as peripheral regions. A qualitative case study approach was adopted to compare three regions—Twente (NL), Aveiro (PT) and North Denmark (DK)—in order to develop a deeper theoretical and empirical understanding of universities' contributions. The data of this thesis consist of a total of 120 semi-structured interviews with key informants as well as secondary documents and archival records of interest (including, for example,

policy agendas, organisational reports and collaboration agreements). This data set was analysed using the theoretical framework established in order to explore the ways in which individual and collective agency via entrepreneurship has led to the more structural effects that have improved the respective regional bases.

I argue that alignment is necessary for the creation of a shared actionable knowledge base and identify two alignment circuits that are essential for institutional entrepreneurs to contribute to regional (path) development: (1) alignment of the diverse regional actors, and (2) internal alignment of university stakeholders (including the strategic centre as well as the functional and academic departments). However, universities have links at different organisational levels and interact with various external partners, thus creating a dynamic and unpredictable framework. This dissertation contributes to debates on institutional entrepreneurship, place leadership and agency by arguing that alignment can be the solution to the problems posed due to the nature of this complex setting. Ultimately, alignment can empower university institutional entrepreneurs to address regional challenges. In contrast to the prevailing tendency to assume that operational logics follow strategic design, I highlight that individuals are shaped by a range of contexts that are not just organisational or operational, but that are built in a complex interplay between the two. I conclude by arguing that debates on regional innovation policies have made a gross over-simplification when referring to multi-stakeholder processes aimed at creating new regional futures.

Er zijn twee partijen nodig om een brug te bouwen - Universiteiten als institutionele entrepreneurs in op kennis gebaseerde regionale ontwikkeling

Onder regionale beleidsmakers en professionals wordt algemeen aangenomen dat een succesvol innovatiebeleid afhankelijk is van het leiderschap in regionale coalities. Deze coalities - bestaande uit vertegenwoordigers van verschillende organisaties, zoals regionale overheden, bedrijven, universiteiten - worden verondersteld naadloos samen te werken en gezamenlijke regionale innovatieagenda's te ontwikkelen, deze uit te voeren, en zo bij te dragen aan regionale innovatie. De universiteit levert een belangrijke bijdrage aan deze coalities vanwege haar sleutelrol als producent en verspreider van kennis. Universiteiten zijn echter complexe organisaties en bezitten meervoudige strategische belangen. Dit roept de vraag op of universiteiten wel de rol kunnen spelen die van ze wordt verwacht in het regionale innovatiebeleid. Door onvoldoende rekening te houden met deze complexiteit negeren wetenschappers en beleidsmakers het gegeven dat universiteiten vaak onvoldoende zijn toegerust om een coördinerende rol te spelen op het gebied van de regionale kennisproductie en -circulatie.

In dit proefschrift gaan we in op deze belangrijke vaststelling en stellen we de volgende onderzoeksvraag: "Hoe handelen universiteiten als institutionele actoren in het regionale innovatiebeleid?" We analyseren hoe de dynamiek en de specifieke eigenschappen van universiteiten als organisaties van invloed zijn op de deelname van universiteiten aan deze regionale coalities en hun bijdrage aan collectieve innovatiebeleidsprocessen in de regio. Meer in het bijzonder richten wij ons op het institutioneel ondernemerschap van academici in de universiteit. Dit individuele gedrag kan een meer structureel effect hebben op regionale innovatie, vooral in perifere regio's waar de institutionele netwerken relatief minder goed ontwikkeld zijn.

We hebben een kwalitatieve casestudy-aanpak gehanteerd, waarbij we drie regio's vergelijken: Twente (Nederland), Aveiro (Portugal) en Noord-Denemarken. Dit om een dieper theoretisch en rijker empirisch inzicht te krijgen in de bijdrage die

de universiteit levert aan de regionale ontwikkeling. De informatiebasis voor dit proefschrift bestaat enerzijds uit 120 semi-gestructureerde interviews met sleutelinformanten uit de regio's en, anderzijds, uit documenten, beleidsnota's, (onderzoeks)rapporten, samenwerkingsovereenkomsten, et cetera. Deze informatie is geanalyseerd aan de hand van een theoretisch kader dat ons in staat stelt gedrag en zingeving (in het Engels: agency) van individuele en collectieve actoren ten aanzien van ondernemerschap te begrijpen en te verkennen of dit gedrag structureel heeft bijgedragen aan regionale ontwikkeling.

We concluderen dat twee dimensies van afstemming essentieel zijn voor het creëren van de gezamenlijke handelings-gerichte kennisbasis die nodig is voor regionale ontwikkeling. Deze dimensies die we hebben geïdentificeerd voor institutionele entrepreneurs zijn: 1) afstemming tussen de diverse regionale actoren, en 2) interne afstemming tussen de universitaire belanghebbenden (d.i. het strategisch niveau, de functionele afdelingen en academische eenheden). Universiteiten hebben echter op verschillende organisatieniveaus vele relaties en interacties met verschillende externe partners waardoor een dynamisch en onvoorspelbaar speelveld ontstaat.

Dit proefschrift draagt bij aan het debat over institutioneel ondernemerschap en regionaal leiderschap van universiteiten. We concluderen dat, gegeven de complexe setting waarin de universiteit opereert, het werken aan afstemming - tussen de diverse regionale actoren en (intern) tussen academische actoren - de universitaire entrepreneurs beter in staat stelt om de regionale uitdagingen aan te gaan. In tegenstelling tot de heersende opvatting dat strategisch beleid als vanzelfsprekend leidt tot een operationeel handelingsrepertoire, stellen we in deze dissertatie dat het gedrag van de betrokken individuen wordt bepaald door een veelheid van contexten. Deze contexten zijn niet alleen van organisatorische dan wel operationele aard, maar worden gevormd door een complex samenspel van deze twee. Deze conclusie staat in scherp contrast met de te sterk vereenvoudigde aannames tot nu toe over de processen en betrokkenheid van veelsoortige stakeholders bij de vormgeving van het regionale innovatiebeleid.

ANNEX IV: ABOUT THE AUTHOR

Lisa Nieth is a PhD Researcher at the University of Twente and the Regio Twente (the Netherlands). She is conducting her research as a Marie Skłodowska-Curie Fellow within the Innovative Training Network project entitled "The Role of Universities in Innovation and Regional Development".

Lisa graduated from the University of Passau (DE) and the University of Stirling (UK) where she completed a double degree programme in International Management and Intercultural Studies (MA). Before taking on her current position as a researcher, Lisa spent three years in Santiago de Chile as a consultant and project manager focusing on innovation, entrepreneurship and public policies.

ANNEX V: THE RUNIN PROJECT[21]

The researcher is part of the Innovative Training Network RUNIN tasked with analysing the "Role of Universities in Innovation and Regional Development" (Call: H2020-MSCA-ITN-2016).

A total of 14 PhD researchers situated in seven different regions have aimed to create a body of knowledge on how universities can contribute to innovation and development in various regions. The research is focused on identifying policies and practices that can be adopted by universities, firms and regional stakeholders to improve levels of regional innovation.

The research programme is structured through the following four research themes, each of which explores a different facet of the relationship between universities and the surrounding firms and regions. Lisa Nieth's work is placed within the second research theme.

- The first research theme, **People and Networks**, focuses on the role of individuals and their networks in knowledge transfer between universities and firms.
- The second research theme, **Policies and Interventions**, examines the interaction of universities with public policy, both as subjects of policy interventions and as participants in policy networks.
- The third research theme examines the role of **Places and Territories** in structuring interactions between firms and universities in terms of both local production structures and global value chains.
- The fourth research theme focuses on **Practices and Governance**, examining the changing practices of university-firm interaction and how this is affecting the governance of universities and their interaction arrangements with firms.

[21] The information presented here is a summary of the project proposal as well as the information displayed on the RUNIN homepage: https://runinproject.eu.

Kennispunt Twente is a not-profit, government-related research agency housed at Regio Twente, as an independent entity. It aims at strengthening the knowledge position of the fourteen municipalities in Twente by providing high-quality information and data for operational and control purposes.

www.kennispunttwente.nl

CHEPS, the Center for Higher Education Policy Studies, is a research institute at the University of Twente offering research, training and consultancies on various aspects of higher education policy.

www.utwente.nl/en/bms/cheps

IT TAKES TWO SIDES TO BUILD A BRIDGE

Universities as institutional entrepreneurs in knowledge-based regional development

There is a widespread assumption that successful regional innovation policies are dependent upon place leadership from coalitions of actors. These coalitions - consisting of different organisations such as regional authorities, companies or universities - are assumed to work together seamlessly and develop/enact collective innovation agendas to achieve regional development. The university is an important coalition partner because of its role as a producer and disseminator of knowledge. However, universities are complex organisations, sometimes lacking strong singular strategic interests. In this dissertation, I address the role of universities and how their organisational dynamics and particularities influence their participation in regional innovation coalitions as well as their contributions to regional innovation policy processes.

More specifically, I focus on acts of institutional entrepreneurship undertaken by university employees and argue that alignment is a key issue. I identify two alignment circuits as being essential for the university's contribution to regional development: (1) alignment of the diverse regional actors, and (2) internal alignment of university stakeholders. Universities have links at different organisational levels and interact with various external partners, thus creating a dynamic and powerful - but often unpredictable - framework. This dissertation contributes to debates on institutional entrepreneurship, place leadership and agency and argues that more attention for alignment can encourage and empower the university's institutional entrepreneurs to address regional challenges.

RUNIN The Role of Universities in Innovation and Regional Development