Rıdvan Çınar

TOWARDS AN ENGAGED UNIVERSITY IN THE PERIPHERY: INNOVATION, REGIONAL DEVELOPMENT AND INSTITUTIONAL CHANGE

Thesis for the degree *Philosophiae Doctor* (Ph.D.)
in Responsible Innovation and Regional Development at the
Western Norway University of Applied Sciences

Disputation: 8.2.2022

In memory of Paul Benneworth

Thesis submitted to
the Faculty of Engineering and Science,
Western Norway University of Applied Sciences.

ISSN: 2535-8146
ISBN: 978-82-93677-98-7

Author: Rıdvan Çınar
Title: Towards an Engaged University in the Periphery: Innovation, Regional Development and Institutional Change

Printed production:
Molvik Grafisk / Western Norway University of Applied Sciences
Bergen, Norway, 2022

Scientific Environment

This thesis is written as part of studies in PhD program Responsible Innovation and Regional Development in Western Norway University of Applied Sciences. The author was a Marie Sklodowska-Curie Research Fellow in Horizon 2020 RUNIN (The Role of Universities in Innovation and Regional Development) project.

Abstract

The increasing visibility of the impact of various societal challenges, such as climate change, territorial disparity, income inequality and demographic change, has brought the role of innovation to the fore of academic and policy debates. Universities are increasingly expected to mobilise their resources to address these societal challenges through innovation, thereby contributing to regional development. Such expectations are particularly high in peripheral regions generally characterised as having a weak institutional landscape. The complex nature of societal challenges, however, pushes universities to diversify the scope of innovation-related third mission activities. This requires moving beyond traditional regional engagement modes such as technology transfer and industry collaboration towards engaging with other types of innovation (e.g., social) and societal partners (e.g., municipalities and citizens) as well. This is a transformation from mainly an economically oriented third mission ingrained within the entrepreneurial university to a new one involving socially, environmentally and culturally oriented regional engagement as well, which generally manifests within the engaged university model.

While the relevant literature has advanced understanding of the way universities can become engaged, the insights have largely been limited to the context of core regions. This thesis therefore aims to explore the extent to which higher education institutions located in peripheral regions can achieve adopting the engaged model and more importantly, how a transformation from the entrepreneurial to the engaged university takes place in such regions. Here, transformation from the entrepreneurial to the engaged university is conceptualised as an institutional change process, which is further scrutinised through the following three research questions: i) What are the characteristics of individual and organisational efforts geared towards transformation into an engaged university in a peripheral region? ii) Under what conditions can universities located in peripheral regions transform from the entrepreneurial to the engaged model? ii) What are the institutional and organisational

challenges universities face while transforming from the entrepreneurial to the engaged model?

This thesis mobilises five key concepts within institutional theory by delving into the institutional change process of universities: critical juncture, institutional complexity, institutional logics, legitimacy and level of structuration—or degree of institutionalisation. It adopts a qualitative multiple case study design: two public universities located in peripheral regions in the Netherlands and Portugal. The main data utilised were 73 semi-structured interviews and 346 policy documents. The data analysis resulted in five papers that collectively contribute to answering the research questions.

A significant overall finding of the thesis is that transformation into an engaged university is not only dependent on the interplay between two institutions, the state and the market—as is often implied by the literature—but also involves the impact of three other institutions, namely the profession, the community and the corporation. Another significant overall finding is that formal and informal institutions in peripheral regions are able to exert influence and power on universities to shape their behaviour and organisational identity. Furthermore, the remaining findings demonstrate that the characteristics of individual and organisational efforts geared towards transformation into an engaged university in the periphery are: i) using economic and social crises as opportunities to drive change, ii) triggering organisational dynamics to create new units, iii) linking the local with the global through strong collaboration with key actors to claim legitimacy for the desired change, iv) creating space for academic staff to establish their own professional identity and shape research interests in relation to institutional profiling, v) securing key partnerships and collaborating with an extensive range of societal stakeholders, and vi) encouraging ownership of a third mission activity by different actors.

The thesis also reveals that for such agency to take place, certain enabling conditions for institutional change at the macro, meso and micro levels are necessary. They can be summarised as follows: i) relevant conjuncture of

particular developments (macro), ii) coherence among European, national and regional visions and expectations (macro), iii) supportive organisational identity (meso), iv) relevant and supportive institutional logics (meso), v) regulative, normative and cultural-cognitive legitimacy (meso), vi) stable and relevant academic identities (micro), vii) adoption of a university activity by heterogeneous disciplines (micro) and viii) organisational agility (meso/macro). In addition, the thesis also identifies several factors ranging from the dominance of the techno-economic conceptualisation of innovation and related demands upon universities to the difficulty of measuring social impact that challenges the institutional change process.

Based on the findings, the thesis puts forward a number of suggestions for policymakers, practitioners and higher education actors to support universities in peripheral regions in the transformation into the engaged model. First, a separate funding scheme, designed specifically for universities located in less-developed regions of each country, is necessary at both the national and European levels to provide them with more resources. Second, it is time to consider the involvement of non-industrial regional/local actors (e.g., municipalities, non-governmental organisations, other civil society associations) within university senates/councils as well so that the interests of various societal stakeholders are represented within public universities. Third, there is a need for regional interpretation of responsible innovation and responsible smart specialisation to encourage universities to deliver innovations that might help address local manifestations of complex societal challenges. Fourth, universities should hire academic staff that hold different disciplinary and professional socialisations to respond to the demands of global excellence and regional relevance. Finally, this thesis calls for a renewed debate on the role of institutions in innovation and regional development and raises the question of whether peripheries in Western Europe can still be characterised as institutionally-thin regions.

Sammendrag

Aukande påverknad frå ulike samfunnsutfordringar som klimaendringar, regional ulikskap, inntekstulikskap og demografiske endringar har gjort innovasjon til eit gjennomgåande tema i det akademiske og politiske ordskiftet. Det vert i aukande grad forventa at universiteta skal mobilisera ressursar for å handtera desse samfunnsutfordringane gjennom innovasjon, for slik å bidra til regional utvikling. Desse forventningane er desto større i utkantområde som generelt er kjenneteikna av eit svakt institusjonelt landskap. Samstundes gjer samfunnsendringane sin komplekse natur at universiteta gjerne aukar breidda i innovasjonsrelaterte oppgåver knytt til det tredje samfunnsoppdraget. Dette krev at dei går vidare frå tradisjonelt regionalt utviklingsarbeid som teknologioverføring og samarbeid med industri til òg å ta del i andre typar innovasjon (eg. sosial innovasjon) i samarbeid med andre samfunnsaktørar (eg. kommunar, innbyggjarar). Det tredje oppdraget gjennomgår såleis ein transformasjon frå å vera økonomisk orientert, i tilknyting til det entreprenørielle universitetet, til eit nytt som også inkluderer sosialt, miljømessig og kulturelt engasjement, som kjem til uttrykk i det engasjerte universitetet.

Den relevante litteraturen har ei godt utvikla forståinga av korleis universiteta kan utvikla seg mot den engasjerte modellen, men denne forståinga er meir eller mindre avgrensa til kontekstar i sentrale strok. Denne avhandlinga har difor som mål å utforska i kva for grad høgare utdanningsinstitusjonar i utkantregionar kan ta i bruk den engasjerte modellen, og enno viktigare, korleis transformasjonen frå det entreprenørielle til det engasjerte universitet går føre seg i slike regionar. I denne avhandlinga er transformasjonen frå entreprenørielt til engasjert universitet konseptualisert som ein institusjonell endringsprosess. Denne prosessen vert undersøkt gjennom dei fylgjande tre forskingsspørsmåla: i) kva kjenneteiknar individ og organisasjonar sin innsats for å gjera eit utkantuniversitet til eit engasjerte universitet? ii) Under kva for omstende kan universitet i utkantstrok gjennomgå transformasjonen frå den entreprenørielle til den engasjerte modellen? iii) Kva for institusjons- og

organisasjonsmessige utfordringar møter universiteta på vegen frå den entreprenørielle til den engasjerte modellen?
Avhandlinga nyttar fem nøkkelkonsept frå institusjonell teori til å dykka ned i universiteta sin institusjonsendringsprosess: kritisk tidspunkt ('critical juncture'), institusjonell kompleksitet, institusjonelle logikkar, legitimitet og struktureringsgrad (grad av institusjonalisering). Den nyttar eit kvalitativt fleircase design der to offentlege universitet, lokalisert i utkantregionar i Nederland og Portugal, vert undersøkt. Det sentrale datamaterialet i avhandlinga består av 73 semistrukturerte intervju og 346 politiske dokument. Analysa har resultert i fem artiklar som til saman bidreg til å svara på forskingsspørsmåla.

Eit sentralt funn i avhandlinga er at transformasjonen mot eit engasjert universitet ikkje berre avheng av samhandlinga mellom to institusjonar, staten og marknaden – slik litteraturen gjerne peikar mot – men at det òg involverer påverknad frå tre andre institusjonar, nemleg profesjonen, sivilsamfunnet og bedrifta. Eit anna overordna funn er at formelle og uformelle institusjonar i utkantregionar er i stand til å påverka og å utøva makt overfor universiteta for å forma universiteta sine handlingar og organisasjonsidentitet. Vidare syner resten av funna at enkeltpersonar og organisasjonar sin innsats for å transformera utkantuniversitet til engasjerte universitet er kjenneteikna av å: i) bruka økonomiske og sosiale kriser som endringsdrivarar, ii) aktivera organisasjonsdynamikk for å oppretta nye einingar, iii) knyta det lokale opp mot det globale gjennom sterke samarbeid med sentrale aktørar for å skapa legitimitet for den ynskja endringa, iv) laga rom for at vitskapleg tilsette skal kunna etablera sin eigen profesjonelle identitet og utvikla forskingsinteresser i tråd med utviklinga av institusjonen sin identitet, v) sikra sentrale partnarskap og samarbeida med eit vidt spekter av interessentar, og vi) freista skapa breitt eigarskap til aktivitetar knytt til det tredje samfunnsoppdraget.

Vidare syner avhandlinga at denne typen aktørskap krev visse forhold som mogleggjer institusjonell endring på makro-, meso- og mikronivå. Desse kan oppsummerast i det fylgjande: i) visse konjunkturar på relevante område

(makro), ii) koherens mellom europeiske, nasjonale og regionale visjonar og forventningar (makro), iii) ein støttande organisasjonsidentitet (meso), iv) relevante og støttande institusjonelle logikkar (meso), v) regulativ, normativ og kulturell-kognitiv legitimtet (meso), vi) stabile og relevante akademiske identitetar (mikro), vii) deltaking i aktivitetar knytt til det tredje samfunnsoppdraget på tvers av ulike fagdisiplinar (mikro) og viii) organisasjonssmidigheit (meso/makro). I tillegg identifiserer avhandlinga fleire faktorar som utfordrar institusjonsendringsprosessen, frå ei dominerande tekno-økonomisk innovasjonsforståing og relaterte krav retta mot universiteta til utfordringar med å måla sosiale effektar av universiteta sitt arbeid.

Basert på desse funna legg avhandlinga fram fleire forslag for politikkutforming og praksis for å støtta utkantuniversiteta i transformasjonen mot den engasjerte modellen. For det første trengs eigne finansieringsprogram tilpassa universitet i mindre utvikla regionar, både på europeisk og nasjonalt nivå, for at utkantuniversitet i transformasjon skal ha tilgang på nok ressursar. For det andre er det på tide å vurdera deltaking frå regionale og lokale aktørar ut over industri (kommunar, sivilsamfunnsorganisasjonar) i universitetsstyra slik at interessene til ulike samfunnsgrupper er representert i offentlege universitet. For det tredje trengs 'regional' tolking av ansvarleg innovasjon og ansvarleg smart spesialisering for å oppfordra universiteta til å utvikla innovasjonar som bidreg til å handtera lokale uttrykk for komplekse samfunnsutfordringar. For det fjerde bør universiteta tilsetja personar som har vore gjennom ulik fagleg og profesjonell sosialisering for slik å vera betre rusta til å svara på krav både om global vitskapleg fortreffelegheit og om regional relevans. Til sist etterspør denne avhandlinga ein ny debatt om institusjonar si rolle i regional utvikling, og stiller spørsmål ved om utkantregionar i Vest-Europa framleis kan karakteriserast som institusjonelt tynne regionar.

Table of Contents

List of Tables and Figures

ACKNOWLEDGEMENTS

This PhD journey would not have been possible without the support of many. First and foremost, I owe my deepest gratitude to my supervisor, Lars Martel Antoine Coenen, whose intellectual rigour has shaped this thesis in multiple ways. I woke up one day to the shocking and saddening news that my former supervisor, Paul Benneworth, passed away unexpectedly. I felt lost and was not sure about the future viability of my thesis. To my relief, Lars stepped in and took over my supervision, ensuring that I would get much-needed support in this journey. From providing critical feedback to my papers and the thesis and being a great co-author to giving career advice and encouraging future grant applications, he has gone beyond his duty in supporting my academic and professional endeavours. Having an endorsement from such an eminent scholar with a stellar reputation has surely been reassuring when it comes to taking academic initiatives. I am especially thankful for the non-hierarchical nature of our discussions, which I truly looked forward to. Thank you, Lars for believing in my work and me.

I am also grateful to my co-supervisor Dzamila Bienkowska, whose intellectual rigour as well as guidance and insightful comments have likewise significantly shaped this thesis. I vividly remember her instant message to me shortly after we learnt that Paul passed away: “Let me know if there is anything I can do and take care.” These words epitomised her unconditional support for me during this journey. I was lucky to have her on my supervisory team.

I would also like to express my profound gratitude to Paul Benneworth, my former supervisor. It still feels surreal to think that he is no longer among us. From guiding me in navigating through my fieldwork in the Netherlands to introducing me into his wide professional network, he contributed significantly to my academic and professional development.

This doctoral research was part of a broader European Commission Marie Sklodowska-Curie Actions project, namely Role of Universities in Innovation and Regional Development (RUNIN). I would like to extend special thanks to the project leader, Rune Dahl Fitjar, who led a very successful project. He was tremendously supportive of PhD students at RUNIN throughout our research journey. His encouraging and uplifting can-do attitude is what I have taken from his excellent leadership. Similarly, I would also like to thank the RUNIN project coordinator, Kristoffer Woldseth Moldekleiv, who—through his great support and organisational skills—ensured that our doctoral education, from fieldwork to the training weeks and conference participation, went smoothly.

During this PhD work, I spent two secondments, one at the Center for Higher Education Policy Studies (CHEPS) at the University of Twente and another at the European Consortium of Innovative Universities (ECIU) for fieldwork and data collection. I am grateful for the hospitality and support I received from colleagues at CHEPS, which certainly facilitated my data collection. In particular, I deeply appreciate the inspiring and informative discussions with Harry de Boer, which served as an introduction into the specificities of the Dutch higher education system. I am also grateful to Katrin Dircksen, Secretary General of ECIU, for introducing me to the organisational and institutional realities of young and innovative European higher education institutions, including the two universities I explored in this thesis.

Special thanks go to the senior colleagues and fellow early-stage researchers in the RUNIN network for inspiring discussions and solidarity. In particular, I appreciate the constructive feedback provided by David Charles on my two papers as well as my discussions and collaboration with two PhD fellows—Lisa Nieth and Liliana Fonseca—in data collection.

My doctoral education and this thesis are part of the PhD program in Responsible Innovation and Regional Development (RESINNREG) at the Mohn Center for Innovation and Regional Development, Western Norway University of Applied Sciences. I am immensely thankful to the great colleagues there for creating a wonderful academic atmosphere. With its

courses, seminars and great members, RESINNREG has deepened my knowledge base and helped me become a part of the innovation studies and regional studies communities. In particular, I sincerely appreciate the comments I received from Arnt Fløysand and Elvira Uyarra in my final seminar. These not only improved this thesis but also encouraged me to pursue related key research avenues in the future. Special thanks also go to Nora Geirsdotter Bækkelund, who helped in translating the abstract into Norwegian. I am very much appreciative of our weekly digital coffee breaks, an event she initiated that provided us PhD students an opportunity to get away from the hassle of doctoral work and brightened our days during the long Covid-19 lockdowns. I also enjoyed our discussions, which sometimes felt like we represented two opposite poles and reignited an old and still ongoing structure-agency debate, which was therefore genuinely inspiring.

I would also like to thank my friends Tayfun Kasapoglu and Diego Henrique Galego, with whom I have gone through the bumpy road of PhD ups and downs, albeit we were in different countries and universities. I truly appreciate the support I received from them during my downs and for sharing joyful moments during the ups.

Last but definitely not least, I am grateful to my parents, brother and sister for the unconditional support I have received during all these years. Despite living in three different countries thousands of kilometers away, their invaluable support has always provided me with the confidence and strength needed to take the next step in this arduous journey.

List of Publications

Cinar, R., Benneworth, P., & Coenen, L. (2021). Changing conceptualization of innovation in the European Union and its impact on universities: Critical junctures and evolving institutional demands**.** *Research Evaluation*, (under review)**.**

Cinar, R., & Coenen, L. (2021). Universities' contribution into culture and creativity-led regional development in the periphery: Conflicting demands and hybrid organizational responses**.** *Industry and Higher Education*, (submitted).

Cinar, R., & Benneworth, P. (2020). Why do universities have little systemic impact with social innovation? An institutional logics perspective. *Growth and Change*, (ePub ahead of print).

Cinar, R. (2020). Structuration of natural resource-based innovations in universities: How do they get institutionalized? *Sustainability, 12*(5), 1834.

Cinar, R. (2019). Delving into social entrepreneurship in universities: Is it legitimate yet? *Regional Studies, Regional Science*, *6*(1), 217-232.

Reprints were made with permission from Growth and Change, Sustainability, and Regional Studies, Regional Science.

1. CHAPTER 1: INTRODUCTION

1.1 Innovation and universities

Innovation as a term derives from the Latin word *innovare*, which means to change or create something novel. The term could be confused with "invention"; therefore, pioneers of innovation studies such as J. A. Schumpeter established a clear distinction between the two: invention is the original development of a novel idea, while innovation is concerned with its introduction into a field and economic exploitation (Dosi & Nelson, 2010). The recent OECD Oslo Manual defines innovation as "a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)," adding that the term unit is generic and refers to "any institutional unit in any sector, including households and their individual members" (OECD, 2018, p. 23). Innovation can thus be technological, social and/or organisational and take place in a firm, industry, organisation or region.

Historically, approaches towards innovation in the literature have changed significantly since the second half of the 20th century. Between 1950 and the mid-1960s, innovation was understood as something dependent on technological progress and scientific discovery, displaying an increasingly strong association with economic growth (Rothwell, 1994). Between the mid-1960s and throughout the 1970s, market dynamics and user needs came to play a role (Marinova & Phillimore, 2003). Innovation was still seen as a linear process pushed by technology and science and pulled by market dynamics with great emphasis put on interaction between the two (Rothwell, 1994). The 1980s entailed a perspective change, first at in the academy and then gradually within policy circles: innovation could occur non-linearly and be iterative (Kline & Rosenberg, 1986). It was therefore seen as a process involving different departments in a firm interacting with each other at different stages (Rothwell & Zegveld, 1985). For about 40 years, up until the late 1980s, the primary unit of analysis in the field of innovation was the firm. This was about to change when the decade ended.

Starting in the early 1990s, place appeared as an important factor determining innovation, which was seen as a systemic process taking place in national and regional environments where networking and interconnectedness played a crucial role in its success (Marinova & Philimore, 2003). National systems of innovation (Freeman, 1991; Lundvall, 1992) and regional innovation systems (Asheim & Coenen, 2005; Cooke, 2001) emerged as key concepts highlighting the importance of institutions, financial and administrative capacity and systemic learning in fostering innovation, albeit at different levels.

The decade between 2000 and 2010 witnessed developments at both the firm and place levels simultaneously. Open innovation, a paradigm which posits that firms can and should benefit from external sources, such as users, expertise of public agencies and competitors to foster a variety of innovation (Chesbrough, 2003), was and still is increasingly accentuated. At the place level, innovation became increasingly territorial and localised with concepts such as innovation clusters (OECD, 1999), geographical proximity (Torre & Rallet, 2005) and regional innovation strategies (Morgan & Neuwalers, 1999) gaining popularity, followed by the emergence of the smart specialisation concept (Foray, 2009) towards the end of the decade. Since 2010, a period has commenced during which multiple developments in innovation have unfolded, partly due to recent environmental socioeconomic and political developments. Climate change, the financial crisis of 2008 and the severe austerity measures that followed it in many countries as well as growing territorial disparity—particularly in Europe—that became quite visible in the late 2000s, have led to a reconsideration of innovation and its geographical scope and purpose. As a result, there has been growing emphasis put on some types of innovation (e.g., social innovation) that have been underemphasised by both academics and policymakers in the past as well as relatively new types of innovation (e.g., eco-innovation, frugal innovation, etc.). Likewise, there has also been increased recognition that innovation exists in peripheral/less developed regions.[2] In addition, a place-sensitive approach has almost been

[2] In this thesis, the terms "peripheral" and "less-developed" are used interchangeably.

consolidated, especially in Europe, and innovation has assumed new missions, such as tackling complex societal challenges.

Reviewing the aforementioned 70 years of developments within innovation studies, Schot and Steinmueller (2018) incorporate their implications for innovation into three configurations, which they characterise as i) framing one: innovation for growth, ii) framing two: national systems of innovation and iii) framing three: transformative change. The framing one model was based on the premise that greater funding and investment are needed for science to deliver economic growth, technological change and the modernisation of industries. This would happen through "commercialization of scientific discovery with each of the processes that follow discovery driven by the economic logic of investment and financial return from the potential market for the innovation" (Schot & Steinmueller, 2018, p. 3). Universities were therefore recognised for the scientific knowledge they produced. The framing two model—national systems of innovation—emerged out of the realisation that significant international differences exist in innovation capacity. These differences were driven by absorptive capabilities, absorptive capacity, tacit elements inherent in scientific and technological knowledge and the cumulative and path-dependent nature of technological change. In this framing, states were believed to shape long-term innovation capacity through organisational innovations and institutional arrangements. The poster child of this model was Japan, later followed by Singapore, South Korea, Taiwan and Hong Kong. The complex nature of knowledge creation was recognised and universities were thus expected to collaborate with multiple industrial partners as well as users in fostering knowledge-based entrepreneurship.

The last framing, transformative change, emerged out of increased recognition that the national systems approach might have reached its innovation objectives but did not benefit everyone, even in innovation-leading countries (Schot & Steinmueller, 2018). On the contrary, there has been a trend of social exclusion, income inequality and depletion of resources due to consumption and resource-dependent industries and modes of production. It has become evident that to tackle social and environmental challenges, a certain level of

directionality in innovation policy as well as experimentation and an overall change within socio-technical systems is necessary. Framing three, therefore, "focuses on innovation as a search process on the system level, guided by social and environmental objectives, informed by experience and the learning that accompanies that experience, and a willingness to revisit existing arrangements to de-routinize them in order to address societal challenges" (Schot & Steinmuller, 2018, p. 10). Universities are thus expected to engage with proposed experimentation, different types of stakeholders and bridge social sciences with STEM fields in order to contribute to transformative innovations. However, they have rather habitualised investing primarily in technological innovation, the commercialisation of research and start-ups and engaging with industry in the entrepreneurial university model over the past decades. The expectations of framing three of innovation, on the other hand, require them to transform from the entrepreneurial to the engaged university model in which they assist fostering different types of innovations (e.g., social innovation) as well as to be more societally relevant. Given the increasing demands of remedying weak institutional landscapes and addressing complex societal challenges through innovation, this pressure is particularly relevant for universities located in peripheral regions, raising the question of what enables/hinders their transformation, which itself, I argue, is an institutional change. In this thesis, therefore, I aim to explore factors affecting the institutional change process of universities in peripheral regions.

Although they follow one another chronologically, Schot & Steinmueller (2018) argue that the rise of framing three does not replace previous ones. On the contrary, they are still relevant, may compete with each other and certain of their elements will be needed for sustainable transitions. Nevertheless, a distinguishing aspect of framing three is its more serious consideration of the negative externalities of innovations and the proposition that such potential consequences might be avoided from the beginning. In fact, the concept of responsible research and innovation (RRI) takes this debate a step further and challenges the inherent belief that innovation is always beneficial and leads to positive outcomes.

RRI discussions trace back to the arguments in the science and technology studies literature, implying that scientists should consider the potential negative impact of their research and contemplate how to avoid them (Jasanoff et al., 1994; Zwart et al., 2014). What started as responsible research later evolved to accommodate innovation as well, thereby becoming "responsible research and innovation" (Owen et al., 2012). As emphasis on responsibility within non-research-based innovations has also grown over time, the concept of responsible innovation ultimately became more widely used. Von Schomberg (2011, p. 9) defines responsible innovation as:

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

Stilgoe, Owen and Macnaghten (2013) developed a framework for responsible innovation consisting of four dimensions, namely anticipation, reflexivity, inclusion and responsiveness. The anticipation process takes into consideration "the contingency, what is known, what is likely, what is plausible and possible" and it "involves systematic thinking aimed at increasing resilience, while revealing new opportunities for innovation and the shaping of agendas for socially-robust risk research" (Stilgoe et al., 2013, p. 1570). Reflexivity requires scientists and innovation actors to consider the ethical responsibilities of their professional role as well as the moral responsibilities of societies to which they are expected to contribute. Codes of conduct and moratoriums are some of the instruments by which reflexivity can be achieved (von Schomberg, 2013). Inclusion aims at involving wider public and societal partners in the innovation process and moving beyond instrumental engagement with these actors (Stilgoe et al., 2013). Lastly, responsiveness is a dimension that is concerned with "responding to new knowledge as this emerges and to emerging perspectives, views and norms" (Stilgoe et al., 2013, p. 1572). Jakobsen, Floysand and Overton (2019) argue that despite the increasing number of studies focusing on responsible innovation, the relevant literature still lacks a clear territorial perspective. This is an important missing lens considering that societal challenges

manifest differently across the world and yet, what constitutes the scope of responsibility is not clear: Should innovations be regionally, nationally or globally responsible? Likewise, the role of universities in responsible innovation is also vague: Should they contribute to local, national or global responsible innovation processes?

1.2 Regional development and universities

Regional development has traditionally had economic underpinnings such as growth and employment (Armstrong & Taylor, 2000). In fact, economic concerns have been so dominant in development discussions that the concept has largely been associated with "regional economic development" (Beer et al., 2003). However, dissatisfaction with orthodox neo-classical economic arguments has given rise to alternative approaches that ground social, environmental, cultural and political concerns within regional development (Geddes & Newman, 1999; Morgan, 2004). While early approaches towards regional development have been concerned with quantitative indicators, such as the gross domestic product (GDP), the number of jobs/firms created and mainly focused on core regions, recent alternative perspectives have been driven by qualitative concerns, such as environmental and social sustainability and the quality of jobs and have been concerned with all types of regions (Pike et al., 2007). Pike et al. (2007) argue that approaches from both sides may conflict in different parts of the world, which may manifest in different forms depending on various local and regional actors' interests and whose values are represented in regional development visions. They further claim that in addition to local agency and dynamics, regional development strategies are still also shaped in relation to national and global forces. Characteristics of these regional, national and global dynamics thus determine the extent to which recent approaches can achieve purchase.

A gradual shift of focus from economic growth to wellbeing affects the role of universities in regional development. Previously, universities were primarily expected to contribute to economic growth and thus regional economic development. They strived to meet this particular demand by pursuing—yet again—an entrepreneurial profile, thereby collaborating with firms mainly

located in nearby core regions, contributing to technology transfer and the creation of new ventures (Audretsch, 2014; Clark, 2004). Similar to framing three, recent approaches in regional development also require universities to contribute to all types of innovation and the wellbeing of citizens, including those residing in peripheral regions, which generally manifests through the engaged model (Breznitz & Feldman, 2012; Uyarra, 2010). The fact that framing one (innovation for growth) and earlier development approaches (economic growth) are still relevant while framing three (transformative change) and recent development approaches (wellbeing) are gaining momentum implies that universities should transform from the entrepreneurial to the engaged model without completely abandoning key attributes of the former to meet all expectations, which I will further scrutinise in this thesis.

1.3 Knowledge gaps and research questions

There is abundant literature focusing on either entrepreneurial universities (e.g., Audretsch, 2014; Clark, 2004; D'Este & Perkmann, 2011; Etzkowitz, 2013; Guerrero & Urbano, 2012; Pinheiro & Stensaker, 2014) or engaged universities (e.g., Breznits & Feldman, 2012; Bridger & Alter, 2006; Watson et al., 2011; Weerts, 2014). Most of these studies focus on only one model, thereby helping us understand what it is, what it entails and how it is conceptualised. In addition, they usually draw on successful cases of universities, which are located at the economic hub of their respective countries and able to become either entrepreneurial or engaged. While these studies have provided insights into the way universities can become entrepreneurial or engaged, there remains a gap in the literature regarding the extent to which higher education institutions located in peripheral regions can achieve this and more importantly, how a transformation from one model to another takes place in such regions. This is a transformation from mainly an economic oriented third mission to a new one involving social, environmental and cultural oriented regional engagement activities as well. In this thesis, I therefore aim to delve into such an institutional change process and formulate the following three research questions:

a) *What are the characteristics of individual and organisational efforts geared towards transformation into an engaged university in a peripheral region?*

b) *Under what conditions can universities located in peripheral regions transform from the entrepreneurial to the engaged model? (RQ1)*

c) *What are the institutional and organisational challenges universities face while transforming from the entrepreneurial to the engaged model? (RQ2)*

These three research questions are further explored in the following five papers, which include various sub-research questions presented in Table 1:

Paper A: Cinar, R., Benneworth, P. & Coenen, L. Changing conceptualization of innovation in the European Union and its impact on universities: Critical junctures and evolving institutional demands. *Under review*.

Paper B: Cinar, R., & Coenen, L. Universities' contribution to culture and creativity-led regional development: Conflicting institutional demands and hybrid organizational responses. *Under review*.

Paper C: Cinar, R., & Benneworth, P. (2020). Why do universities have little systemic impact with social innovation? An institutional logics perspective. Published in *Growth and Change*.

Paper D: Cinar, R. (2019). Delving into social entrepreneurship in universities: Is it legitimate yet? Published in *Regional Studies, Regional Science*.

Paper E: Cinar, R. (2020). Structuration of natural resource-based innovations in universities: How do they get institutionalized? Published in *Sustainability*.

1.4 Overview of the papers

This section briefly discusses the content of individual papers in relation to the three research questions. In this thesis, transformation from the entrepreneurial to the engaged university model is conceptualised as an institutional change process. As such, this section also outlines how each paper helped explore this process, presented again in Table 1, while the contributions of each author in multi-authored papers (A, B and C) are specified in Table 2.

Paper A explores the changing conceptualisation of innovation at the European Union level over the past four decades and how it has impacted institutional demands on European universities. A large body of policy documents related to innovation in the EU was analysed to achieve this. The paper demonstrates why different innovation-related institutional demands have emerged over time, setting the ground at the macro level in explaining the rationale from universities behind expected institutional change.

Paper B delves into universities' responses to conflicting institutional demands, such as contribution to culture and creativity-driven regional development and mission differentiation. By using a single case study approach relying on semi-structured interviews and relevant document analysis, it sheds light on how conflicting institutional demands emerge and permeate universities. Moreover, it also demonstrates how the selected university navigated through this complex institutional environment.

Paper C aims to understand why universities have not yet fully mobilised their resources to contribute to social innovations systematically. By adopting a multiple case study approach with semi-structured interviews in two universities located in different countries, it uncovers the dominant institutional logics with regard to social innovation in the field. In doing so, it portrays universities' institutional and organisational challenges in systematically contributing to social innovation as well as field actors' strategies to overcome them.

Table 1. Overview of thesis papers and their contribution

Paper	Sub-research question in the paper	Dimension of transition	How it helps explain the institutional change process	Answers Research Question
A	What are the antecedents of changing conceptualisations of innovation in the European Union and how do they affect innovation-related demands on European universities?	Social Cultural Environmental	By identifying critical junctures at the macro level that form a fertile ground for institutional change and trigger organisational dynamics. Furthermore, it points out the challenges of institutional change.	RQ2 RQ3
B	When they face conflicting institutional demands of mission differentiation and contribution into culture and creativity-led regional development, what kind of organizational responses do universities formulate?	Cultural	By revealing how conflicting institutional demands emerge and permeate universities and identifying the factors shaping universities' organisational adaptation efforts to respond to these demands.	Mainly RQ1 Partly RQ2
C	To what extent can we characterise universities' responses to external demands to support social innovation using existing frameworks developed for technological innovation systems?	Social	By identifying institutional logics with regard to social innovation in universities and discussing whether these logics are supportive enough to initiate an institutional change process in fostering social innovation.	Mainly RQ1 Partly RQ2 and RQ3
D	Which factors affect the legitimacy process of social entrepreneurship within universities?	Social	By exploring whether social contributions of universities are seen as legitimate and valuable enough to trigger a change and new organisational arrangements.	RQ3
E	How do natural resource-based innovations get institutionalised within universities and what are the factors contributing to their high degree of institutionalisation?	Environmental	By examining factors that affect the institutionalisation of a third mission activity over a long period of time and discussing its future viability.	Mainly RQ1 Partly RQ2 and RQ3

Paper D explores whether the legitimacy of social entrepreneurship and thus social innovation by extension, is established within universities and the factors affecting the (de)legitimization process. It uses a single case study

approach focusing on a public university and discusses different types of legitimacy essential to initiating an institutional change process. Through semi-structured interviews, it shows how the individual agency within universities perceives the legitimacy of social entrepreneurship and how this in turn shapes their overall regional engagement behaviour.

Paper E examines the institutionalisation process of natural resource-based innovations in universities. It also focuses on a single case study, a public university, delving into 28 years of history of contributions to innovation through natural resources. By analysing semi-structured interviews, policy and other university documents, it establishes three distinct phases of institutionalisation. Furthermore, it reveals the extent to which such innovations are institutionalised, external and internal factors contribute to it and institutional challenges that might affect this process in the future. In doing so, it discusses whether such third mission activities can survive in the future.

The thesis is structured as follows. First, I will review the literature on innovation in peripheral regions, the characteristics of engaged universities and the institutional approach in regional studies, and then elaborate on key concepts of institutional theory in Chapter 2. In Chapter 3, I will detail my philosophical approach—critical realism—which shaped this study and summarise my personal path in pursuing a PhD degree as well as research design and methods. Following that, I will present the case studies—University of Twente in the Netherlands and University of Aveiro in Portugal—and reflect on characteristics of the Twente and Aveiro regions in Chapter 4. Finally, I will discuss the results through the lens of institutional theory and critical realism in Chapter 5 and conclude with policy implications, contributions to literature and theory and recommendations for future research in Chapter 6.

Table 2. Author's contribution in multi-authored papers

Paper	**A**	**B**	**C**
Title	Changing conceptualization of innovation in the European Union and its impact on universities: critical junctures and evolving institutional demands	Universities' contribution to culture and creativity-led regional development: conflicting institutional demands and hybrid organizational responses	Why do universities have little systemic impact with social innovation? An institutional logics perspective
Status	Under review (19.04.2021)	Under review (21.07.2021)	Published
Journal	Research Evaluation	Industry and Higher Education	Growth and Change
Authors	Ridvan Cinar, Paul Benneworth & Lars Coenen	Ridvan Cinar & Lars Coenen	Ridvan Cinar & Paul Benneworth
Author Contributions -Conceptualisation & idea (1) -Theoretical framework & literature review (2) -Study design & methods (3) -Data collection (4) -Analysis & interpretation (5) -Manuscript preparation (6) -Discussion & conclusion (7) -Critical revision of the intellectual content (8)	**Cinar** **Cinar** **Cinar & Benneworth** **Cinar** **Cinar & Benneworth** **Cinar, Benneworth & Coenen** **Cinar & Coenen** **Coenen**	**Cinar** **Cinar** **Cinar** **Cinar** **Cinar & Coenen** **Cinar & Coenen** **Cinar & Coenen** **Cinar & Coenen**	**Cinar** **Cinar** **Cinar** **Cinar** **Cinar & Benneworth** **Cinar & Benneworth** **Cinar & Benneworth** **Cinar**

Source: own elaboration partly based on Alpaydin (2021)

2. CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

This chapter includes a review of different engagement modes of universities, including the engaged model, and their changing role with regard to innovation, particularly in peripheral regions. In addition, it introduces the key concepts of sociological and historical institutionalism through which the institutional change process is explored, namely critical junctures, institutional complexity, institutional logics, legitimacy and level of structuration (degree of institutionalisation).

2.1 Innovation in peripheral regions and the role of universities

Scholars of innovation studies and regional studies have traditionally focused on agglomerations and core cities/regions over the past decades whilst exploring innovation activities (Isaksen & Karlsen, 2016; Shearmur, 2012). However, there has recently been a growing body of work focusing on innovation in the peripheries. Although the term periphery has been used extensively to characterise certain regions and cities, there is no universal agreement on what makes places peripheral. There are a number of factors that have been mentioned: limited accessibility/transport costs, low population density/declining demographics, lack of economic activity and human capital, lack of support infrastructure, dominance of traditional industries, prevalence of small- and medium-sized enterprises, lack of knowledge infrastructure, lack of financing, high unemployment rates, lack of critical mass, low innovation rate and no metropolitan influence are some of the most commonly used factors for characterising a region as peripheral (Eder, 2019, p. 131). Furthermore, Eder (2019, p. 132) states, “in the vast majority of studies, a region is seen as peripheral compared to other regions of the nation it is located in.”

In terms of innovation systems, peripheries are typically characterised as organisationally thin regions lacking strong organisations and a common

vision with limited interaction (Zukauskaite et al., 2017). Nevertheless, a significant body of work empirically demonstrates that innovation takes place in peripheral, organisationally thin and remote areas as well (e.g., Aarstad et al., 2016; Fitjar & Rodrigues-Pose, 2011; Jakobsen et al., 2020; Petrov, 2011; Virkkala, 2007). The literature suggests that—unlike in core regions—innovation in peripheries may not necessarily be in high-tech industries but rather in traditional manufacturing sectors (Alderman, 1998; Dubois, 2015; Virkkala, 2007) and in the form of incremental innovation (Davies, Michie, & Vironen, 2012). Shearmur (2015) coined the terms "slow" and "fast innovators" with the former depending less on R&D and frequent interaction and thus, can be more frequently associated with peripheries. Davies et al. (2012) claim that traditional innovation surveys that generally rely on R&D activities may not capture firm-level innovation in peripheral regions. These studies imply that synthetic and symbolic knowledge is perhaps more relevant for firms located in these regions, which may suggest that provision to these areas of such a type of knowledge by nearby universities is more important. Nonetheless, innovation activities in peripheries are not restricted to firm-level economic conceptualisations of innovation. Studies have shown that peripheries can be sites of social innovation as well (Christmann, 2014; Richter, 2019).

In his extensive literature review of innovation in the peripheries, Eder (2019, p. 127) indicates that "peripheral regions that host a university clearly have an advantage over regions lacking higher education institutions." While the existence of a university might be necessary for fostering innovation in such regions, it is far from being sufficient as there can still be a mismatch between the strengths of a university and the needs of the region (e.g., firms) it is located in (Charles, 2016). Nonetheless, it is because of the aforementioned weaknesses of peripheries that universities have increasingly been considered as playing a significant role in spurring innovation in such regions and contributing to regional development as well as addressing societal challenges. In addition to direct economic contributions and the traditional technology transfer mode, studies have shown that these roles can extend to the provision of knowledge-intensive business services to regional firms

(Pinto et al., 2015), the upgrading of human capital needed by the labour market (Evers, 2019; Kitagawa et al., 2021), collaborating with regional stakeholders to contribute to social innovation (Bayuo et al., 2020), the provision of knowledge to co-design regional development pathways (Nieth & Benneworth, 2020), paving the way for global knowledge flows into these regions (Atta-Owusu, 2019), playing a proactive role in the development of regional innovation systems (Coenen, 2007) and more recently, in the design and implementation of smart specialisation strategies (Kempton, 2015). As such, both national and regional policymakers are expecting higher education institutions to mobilise their capacity to deliver all these diverse sets of contributions. However, universities can rarely play all these roles simultaneously and the kind of roles they can and want to assume determines their regional engagement mode.

2.2 Engagement modes of universities

European universities traditionally possessed one main mission: the preservation and transmission of knowledge, that is, teaching (Cooper, 2011). Thanks to the reforms inspired by the idea of the Humboldtian university, research became another main mission of universities during the 19th century (Ruegg, 2004). The institutionalisation of research as a second mission of universities has been characterised as "the first academic revolution" (Etzkowitz & Webster, 1998). Since the early 1980s, partly inspired by the Bayh-Dole Act of 1980 (Mowery et al., 2001), universities have been expected to demonstrate their economic contribution to society and engage with industry. This institutional expectation, then still new, has been referred to as the "second academic revolution" (Etzkowitz, 2001), which requires universities to find ways to commercialise their knowledge and contribute to society, and is commonly termed as the third mission (Laredo, 2007).

During the 1980s, the concept of the third mission initially included research commercialisation, patenting and licensing activities, industry collaboration, technology transfer and efforts geared towards the generation of start-ups and spin-offs. In the following decades, it evolved to the extent that it now accommodates universities' social and cultural contributions as well as

assistance to regional policymaking (Pinheiro et al., 2015). There is now a wide range of university activities classified as third mission (see Table 3) (Compagnucci & Spigarelli, 2020). The kind of third mission activities a university chooses to engage in may result in the specific ways of societal and regional engagement models, thereby influencing its internal organisational and institutional positioning. Reviewing the literature on the engagement modes of higher education institutions, Uyarra (2010) developed a typology of the roles of universities in regional innovation and sketched out five university models: knowledge factory, relational university, entrepreneurial university, systemic university, and engaged university.

Table 3. Examples of hard and soft third mission activities

Creation of a technology park	Producing highly qualified graduates
Spin-off firm formation	Consultancy
Patenting and licensing	Joint research with external organisations
Contract research	Participation in research consortia
Industry training courses	Providing informal advice
Consulting	Prototyping and testing for external organisations
Grantsmanship	Hosting personnel from external organisations and secondments
Publishing academic results	Other type of problem-solving activities

Source: Compagnucci & Spigarelli (2020)

Following the end of World War II, there was an increase in funding for research in universities accompanied by the belief that it would result in product/process innovations and patents (Uyarra, 2010). There was a linear understanding of innovation where investment in basic research would lead to innovation outputs and universities were thus perceived as knowledge factories central to innovation and the creation of economic value for the public (Youtie & Shapira, 2008). The underlying assumption was that knowledge flow between universities and firms was unidirectional from the former to the latter and thus the presence of research-intensive universities would eventually impact the innovativeness of nearby firms (Uyarra, 2010). In

her review, Uyarra (2010, p. 1230) argues that the main role of universities in the knowledge factory model is “production of scientific knowledge,” while the main partners are “high-tech firms located in proximity to universities.” The knowledge factory model has thus been more commonly associated with high-tech regions.

The generous funding (mainly in the US) for research gradually faded away due to economic stagnation in the early 1980s and universities were pushed to seek extra funding by establishing linkages with multiple corporations (Geiger & Sa, 2008). There was a greater recognition that innovation is not necessarily a linear but rather a complex process and knowledge flow between universities and firms can be bidirectional (Scott et al., 2002). Furthermore, the existence and importance of multiple and diverse linkages—through which knowledge flows take place—between higher education institutions and industry became increasingly apparent (Uyarra, 2010). The literature marked different channels, such as publications, informal links, consultancy activities, conferences, meetings and contract research through which knowledge transmission could occur (Cohen et al., 2002; D’Este & Patel, 2007). In this university model, which Uyarra (2010, p. 1230) characterises as “relational,” the main role of universities is “exchange of knowledge” through “linkages” and the main partners are “large manufacturing firms” while the model is generally adopted by universities located in core and to a great extent, high-tech regions.

During the early 1990s, efforts geared towards the institutionalisation of research commercialisation and technology transfer commenced (Geiger & Sa, 2008). Organisational ramifications of such an institutionalisation entailed establishing technology transfer, science parks, incubators and liaison offices and allocation of funding for start-ups and spin-offs, as well as incentive schemes for academic staff to encourage such engagement activities (Uyarra, 2010). Previously, research commercialisation and generation of revenue from such activities was seen as a “by-product of academic research,” while later it became one of the main objectives of universities (Geiger & Sa, 2008, p. 32). In this model, commonly referred to as the entrepreneurial university (Clark

2004; Pinheiro & Stensaker, 2014), the main role of universities is "active commercialization" and their main partners are "large manufacturing firms and spin-offs" (Uyarra, 2010, p. 1230).

The regional innovation system approach became popular during the 2000s and it views universities as key players in fomenting strong and regionally embedded networks, which would then drive innovation (Asheim & Coenen, 2005; Cooke, 1998). It brought a renewed regional perspective to university-industry collaboration: in addition to linkages with large corporations, higher education institutions should also collaborate with regional small- and medium-sized enterprises (Chatterton & Goddard, 2000). The period also witnessed the rise of the triple helix approach, which sees universities as key players in innovation systems, particularly in engaging with government and industry and mediating the interaction between them when necessary (Etzkowitz & Leydesdorff, 2000). In this model, described as the systemic university, the main role of universities is "boundary-spanning" and the main partners are "regional clusters and regional SMEs" and have found ground in universities located in less-favoured regions (Uyarra, 2010, p. 1230).

Over the past decade, policymakers have added new and more ambitious demands on universities to their agenda. Universities have been expected to go beyond economic-oriented commercialisation and valorisation activities, contribute to social, environmental and cultural development of territories they are located in and engage with other regional stakeholders, such as local governments, municipalities, etc. (Uyarra, 2010). In addition, there is now a greater understanding of the role universities can assume in participating and guiding governance of regional innovation (Kempton, 2015). These new expectations affect the understanding of the third mission, which was viewed as an economic-oriented engagement for a long time, implicitly casting a civic and developmental role on universities (Goddard et al., 2016). In this model, commonly referred to as the engaged university, the main role for universities is "developmental" and their main partners are "regional stakeholders" (Uyarra, 2010, p. 1230) and this model, like the systemic university, is generally associated with universities in peripheral regions. Having developed

the typology, Uyarra (2010) argues that the boundaries between different models are not necessarily clear-cut or successive and universities can possess characteristics of different engagement models to a different extent. An overview of the characteristics of each model can be found in Appendix A.

2.2.1 The engaged university

Despite being a relatively new concept, scholars from different parts of the world have portrayed—in their own understanding—what engaged universities entail. Breznitz and Feldman (2012) view engaged universities as institutions that make the following regional contributions within the North American context: establishing community entrepreneurship programmes, real estate development, policy recommendations on several topics such as aging, water management, youth at risk and North American Free Trade, mass student volunteering at state primary and high schools and adult training. In a similar vein, Weerts (2014) also characterises North American universities as engaged if they are involved in training employees of nearby firms on/off campus, giving policy advice at the state level and mobilising students for youth mentoring and community-development projects.

Drawing on empirics from a public higher education institution in Brazil, Thomas and Pugh (2020) show that the engaged university's regional roles extend to establishing elderly networking, community entrepreneurship programmes and food banks, providing healthcare and legal assistance to those who cannot afford it. Furthermore, Watson et al. (2011) also explain that engaged universities, particularly those located in the Global South, have more civic missions, such as combating poverty, improving public health and developing activists and civic leaders. In the European context, as Uyarra (2010) highlights, the focus of the engaged universities is on their role in the formulation and governance of regional innovation. Arbo and Benneworth (2007) argue that engaged universities have similar challenges, such as mismatches between university strengths, higher education and regional policy and the lack of efficient third mission metrics for all types of societal contributions.

2.2.2 Difference between entrepreneurial and engaged universities

As this thesis focuses on transformation from the entrepreneurial to the engaged university model, it is necessary to make the distinction between the two as clear as possible to delve into the specificities of such an institutional change process.

Studies that characterise various universities as entrepreneurial trace the model's emergence back to early attempts aimed at bidirectional knowledge exchange activities (Audretsch, 2014; Clark, 2004; Etzkowitz, 2013; Guerrero et al., 2019). In this sense, I argue that Uyarra's (2010) relational university is indeed the beginning of the entrepreneurial university model. What started as knowledge exchange and technology transfer activities later involved investing in start-ups and spin-offs, establishing science parks and increasing collaboration with different types of firms. Nevertheless, the main motivation behind these third mission activities and their attributes remains the same: to deliver the policy demand of contributing to economic growth with the main motive of technological innovation and expecting that such activities will provide economic returns to universities as well (Bramwell & Wolfe, 2008; Guerrero & Urbano, 2012; Kitagawa, 2005; Pinheiro & Stensaker, 2014; Sanchez-Barrioluengo & Benneworth, 2019).

In comparison, studies depicting specificities of the engaged university point to moving beyond third mission activities nested within economic rationality and commercialisation and encourage a greater involvement of higher education institutions in social, cultural and environmental affairs in the regions in which they are located (Breznitz & Feldman, 2012; Thomas & Pugh, 2020; Uyarra, 2010; Watson et al., 2011). Goddard et al. (2016) suggested the term "civic university" to explain this changing role. However, instead of treating the civic university as a different model, I consider it within the scope of Uyarra's (2010) engaged university due to the similarity of both models' features. In practice, the organisational ramifications of an engaged university are collaboration with actors other than firms, such as municipalities, city councils, cooperatives, non-governmental organisations (including within the

environmental domain)[3] and investing in different types of innovations (see Table 4). The institutional landscape plays a significant role in the construction of both models. But how have regional studies approached institutions, including universities, so far?

Table 4. Main differences between entrepreneurial and engaged universities

	Entrepreneurial university	**Engaged university**
Policy demand	Contribution to regional economic growth and innovation	Contribution to regional economic growth and innovation + Contribution to social, cultural and environmental development
Collaboration with:	A wide variety of firms + Government	A wide variety of firms + Government (also regional and local) + Municipalities/city councils + Other civil society actors
Main objective for organisational change	Establishing units and structures to support commercialisation and mainly technological innovation	Establishing units and structures to support all types of innovation as well as social, cultural and environmental development

Source: own elaboration

2.3 Institutional approach in regional studies and universities

Arguments recognising the role of institutions in economic development initially emerged out of institutional economics. This strand of economic discipline has suggested that institutions play a tremendous role in shaping economic activity at various levels. Nonetheless, they have overwhelmingly focused on formal institutions and prioritised elaboration on institutional stability over institutional change (Rodriguez-Pose, 2020). Governments, justice systems and parliaments are some of the formal institutions that have received the most attention (e.g., Acemoglu & Johnson, 2005; Rodrik et al., 2004). Nevertheless, studies—despite being limited—have shown that

[3] While I recognise that entrepreneurial universities also contribute significantly to environmental development and innovations within this domain, I argue the distinction between the engaged and entreprenuerial models is—similar to other domains—systematic collaboration with non-industry partners and broader society.

informal institutions such as tolerance and social conventions also exert influence in shaping economic development (Florida et al., 2008; Rodriguez-Pose, 2013). While studies on formal institutions have advanced understanding of the role they can play in economic change, they are unable to provide satisfactory explanations for the stark regional economic disparities within the same country. This has recently renewed interest in informal institutions such as values, norms, networks and culture, particularly in the discipline of regional studies.

Interest of regional studies scholars in the role of institutions in regional development has become more apparent, particularly during the late 1990s and early 2000s (e.g., Amin, 2001; Cooke & Morgan, 1998; Martin, 2000; Storper, 1999). It can be argued that evolutionary economic geography has paved the way for the institutionalisation of institutional research within regional studies (Boschma & Frenken, 2006; Martin & Sunley, 2006). Incorporating disciplinary foundations and specificities, Gertler (2004, p. 7) characterised institutions as:

> Formal regulations, legislation and economic systems as well as informal societal norms that regulate the behavior of economic actors: firms, managers, investors, workers. They govern the workings of labour markets, education and training systems, industrial relations regimes, corporate governance, capital markets, the strength and nature of domestic competition and associative behavior.

Interest in informal institutions has resulted in increasingly voluminous research on actor-network relations and the specific outcomes they lead to, a situation characterised by Gertler (2010, p. 4) as "too much actor, not enough structure." This has been the case for higher education institutions as well: studies have illustrated the role of universities in i) the generation of regional start-ups and spin-offs and thereby becoming more entrepreneurial (Bienkowska & Klofsten, 2012; Bramwell & Wolfe, 2008) and ii) strengthening the regional innovation ecosystem by bridging the regional and national with the global (Benneworth et al., 2009; Gunasekara, 2006). These studies demonstrated how universities as institutions could influence individual and organisational actors within a region to shape economic

activities and local development. If universities are regarded as institutions that are able to exert influence, they are then also affected by other institutional orders—including informal ones—and are constantly reproduced. Nonetheless, surprisingly few studies pointing out how universities are influenced by the broader institutional architecture within a region (e.g., Coenen, 2007; Gertler, 2010) have been conducted so far. In this respect, there is a need for a deeper understanding of the role of institutions and their interplay within regional studies in general and a broadened perspective on what higher education institutions can do to foster innovation at various spatial scales in particular.

2.4 Institutional theory

Institutions play a key role in shaping social structures. They influence the way societies are structured and possess attributes through which social life is organised. The question of what exactly an institution is still remains open. Although there have been several attempts to characterise institutions over the past decades, a universally agreed upon definition still does not exist. Scott (2008, p. 49) proposed: "institutions are comprised of regulative, normative and cultural-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life." Such a definition ensures that cultural-cognitive elements are as important as regulative and normative ones, a dimension that was largely missing in the earlier study of institutions.

The history of the study of institutions and organisations dates back to the early 20th century. The work of several scholars, such as Philip Selznick, Charles Perrow and Mayer Zald, is generally regarded as having collectively constituted what is known as institutional theory, contributing to earlier understanding of the institutionalisation process in organisations (Scott, 1987). Selznick (1957), for instance, introduced values into organisations and explained how they contributed or prevented the institutionalisation of certain practices. In this line of research, commonly referred to as old institutionalism despite the introduction of values and institutional analysis into organisations, the focus was still very much on the internal dynamics and

other technical organisational attributes (Powell & Bromley, 2015). Meyer and Rowan's (1977) and DiMaggio and Powell's (1983) seminal works on institutionalised organisations and institutional isomorphism lay the foundation for what would later be termed new institutionalism. This line of research shifted the focus of analysis from internal organisational attributes to the external environment and how it affects organisations. DiMaggio and Powell (1991, p. 8) defined this new strand of institutional theory as:

> The new institutionalism in organization theory and sociology comprises a rejection of rational-actor models, an interest in institutions as independent variables, a turn toward cognitive and cultural explanations, and an interest in properties of supra-individual units of analysis that cannot be reduced to aggregations or direct consequences of individuals' attributes or motives.

Over the past four decades, new institutionalism has developed to such an extent that it currently involves several branches, such as historical institutionalism, sociological institutionalism, rational choice institutionalism, discursive institutionalism and more. In the next section, I will briefly touch on historical and sociological institutionalism, two strands that collectively form the remaining theoretical framework of this thesis.

2.4.1 Historical and sociological institutionalism

Influenced and established by scholars from a wide variety of disciplines, such as political science, economics, history and sociology, historical institutionalism is an interdisciplinary strand of new institutionalism. It focuses on the historical evolution of institutions and institutional fields and argues that path dependency is an important factor in accounting for decisions taken within institutions and organisations (Thelen, 1999). Nevertheless, historical institutionalism refrains from claiming that a future institutional path completely dependent on the past is inevitable and instead acknowledges that institutional fields can experience external shocks/developments that can change organisations' path trajectory (Hogan, 2006). This perspective has enabled this thesis to identify macro level dynamics and developments that account for the broadening of innovation-related institutional demands on universities.

Sociological institutionalism directs attention a bit more towards organisations and individuals within. It focuses on how institutions create meaning for individuals and how organisational actors' values, belief systems and interests lead to multiple interpretations of what is perceived as an appropriate action (Scott, 2008). While earlier studies in this strand of new institutionalism demonstrated how organisations are increasingly becoming similar despite evolving differently (DiMaggio & Powell, 1983; Meyer & Rowan, 1977), scholars later enriched this theoretical approach with widely popular concepts through which organisational reality, field-level dynamics and the interpretation of institutional demands could be discovered (Hardy & Maguire, 2008; Thornton & Ocasio, 2008). Within the context of this thesis, sociological institutionalism helped uncover the organisational dynamics of universities, how institutional pressures permeate them, how different academic groups make sense of emerging institutional demands and why higher education institutions prioritise some demands over others. In doing so, it has helped uncover institutional change processes and the interplay of institutional orders (societal level-logics) exerting influence over this change process.

2.5 Institutional orders (societal-level logics)

Friedland and Alford's (1991) seminal essay, "Bringing society back in: Symbols, practices and institutional contradictions" has laid the foundation of an interinstitutional system in which different institutions of societies at the macro level are considered to influence meso and micro level dynamics. They argue that a true understanding of the role of institutions in society requires a consideration of three levels: "individuals competing and negotiating, organizations in conflict and coordination, and institutions in contradiction and independence" (Friedland & Alford, 1991, pp. 240-241). They identified five institutional orders shaping Western societies: the market, the bureaucratic state, democracy, the nuclear family and Christianity. Building on their work and in an attempt to refine key concepts, Thornton (2004) reorganised the institutional orders—occasionally referred to as ideal types, institutional logics or societal-level logics—into six: a) family, b) religion, c) state, d) market, e) profession and f) corporation. Thornton, Ocasio and

Lounsbury (2012) later added community as another institutional order. These institutional orders possess distinct characteristics: different sources of legitimacy, authority and identity, different basis for norms, attention and strategy and other categorical elements (Thornton, Ocasio and Lounsbury, 2012). An overview of the characteristics of these institutional orders is provided in Table 5.

Table 5. Interinstitutional system ideal types (institutional orders)

Y-axis:	**X-axis: institutional orders**						
Categories	**Family 1**	**Community 2**	**Religion 3**	**State 4**	**Market 5**	**Profession 6**	**Corporation 7**
Root metaphor 1	Family as firm	Common boundary	Temple as bank	State as redistribution mechanism	Transaction	Profession as relational network	Corporation as hierarchy
Sources of legitimacy 2	Unconditional loyalty	Unity of will, belief in trust & reciprocity	Importance of faith & sacredness in economy and society	Democratic participation	Share price	Personal expertise	Market position of firm
Sources of authority 3	Patriarchal domination	Commitment to community values & ideology	Priesthood charisma	Bureaucratic domination	Shareholder activism	Professional association	Board of directors & top management
Sources of identity 4	Family reputation	Emotional connection, ego satisfaction & reputation	Association with deities	Social and economic class	Faceless	Association with quality of craft & personal reputation	Bureaucratic roles
Basis of norms 5	Membership in household	Group membership	Membership in congregation	Citizenship in nation	Self-interest	Membership in guild & association	Employment in firm
Basis of attention 6	Status in household	Personal investment in group	Relation to supernatural	Status of interest group	Status in market	Status in profession	Status in hierarchy
Basis of strategy 7	Increase family honour	Increase status and honours of members & practices	Increase religious symbolism of natural events	Increase community good	Increase efficiency profit	Increase personal reputation	Increase size and diversification of firm
Informal control mechanism 8	Family politics	Visibility of actions	Worship of calling	Backroom politics	Industry analysts	Celebrity professionals	Organisational culture
Economic system 9	Family capitalism	Cooperative capitalism	Occidental capitalism	Welfare capitalism	Market capitalism	Personal capitalism	Managerial capitalism

Source: Thornton, Ocasio & Lounsbury (2012)

Human cognition, organisational culture and values are affected by these institutional orders as individuals, organisations and institutions make sense of social reality through these societal-level logics (Thornton, 2004). Thornton, Ocasio and Lounsbury (2012, p. 65) argue:

> While the process of institutional change is more easily observable at the elemental categorical level, what is important from an institutional logics perspective is that micro-processes of change are built from analogies, combinations, translations and adaptations of more macro institutional logics.

In this sense, change in universities can be conceptualised as the outcome of the interplay of these macro institutional logics, which can be interpreted and acted upon differently at the organisational and individual levels. The vast body of literature delving into the role of universities in innovation and regional development has so far either explicitly or implicitly pointed out the interplay of the two main institutional orders, namely the state and the market. Clark (2004), for instance, shows the state's ability to transform a university into an entrepreneurial one through funding and the formulation of various public policies and indicates the growing influence of the market in triggering this change. Although he acknowledges another dynamic in addition to the state and market—"flexible and adaptive institutional self-reliance"—it is not clear what exactly shapes this. In a similar vein, Weerts (2014) demonstrates that state appropriation—financing in return for displaying expected organisational behaviour—social proximity between university actors and state legislators, as well as a market positioning strategy, determine the extent to which higher education institutions located in Massachusetts, USA can become engaged universities. Even though he points to the impact of a good relationship with external stakeholders in driving the engaged university, the manner in which this broader environment and the surrounding community in particular influence the trajectory of such an institutional change has yet to be explored. It is evident from these studies that the state and the market are highly influential in pushing universities to contribute more to innovation and regional development. However, is transforming into an engaged university all about the state and the market? In the following chapters, I will bring other institutional orders into the picture.

2.6 Key concepts in institutional theory and institutional change

This thesis mobilises some key concepts from institutional theory to delve deeper into the process of institutional change in universities with regard to transforming them into the engaged model. They are a) critical juncture, b) institutional complexity, c) legitimacy, d) institutional logics and e) degree of institutionalisation (level of structuration).

Critical juncture is a concept drawn from historical institutionalism. It refers to periods during which significant events build up, leading to the possibility of institutional change and the availability of multiple alternative options for the institutional trajectory (Mahoney, 2000). It is a popular concept through which macro level developments triggering institutional change as well as periods within which these developments take place can be explored (Cappocia, 2016; Hogan, 2006). In this thesis, critical juncture is used to uncover the antecedents of the changing conceptualisation of innovation as well as innovation-related demands on universities. This concept is further elaborated in Paper A.

Institutional complexity and the remaining key concepts in the thesis originate from sociological institutionalism. Institutional complexity refers to a situation when conflicting and/or competing institutional demands emerge in a field and organisations find themselves in a difficult environment as they are expected to meet all demands simultaneously (Greenwood et al., 2011). It is an important element of the institutional change process because of its ability to demonstrate how institutional demands permeate organisations and how and why some demands are prioritised over others. In this thesis, the institutional complexity perspective is used to portray how a public university responds to the conflicting demands of culture- and creativity-driven regional development and mission differentiation. Paper B provides more detail on this concept.

Institutional logics is defined as “socially constructed historical patterns of material practices, assumptions, values, beliefs and rules by which individuals produce and reproduce their material subsistence, organize time and space

and provide meaning to their social reality" (Thornton & Ocasio, 1999, p. 804). Previous studies have shown that an organisational field can be occupied by a dominant institutional logic (Scott, 2008; Thornton, Ocasio & Lounsbury, 2012) or alternatively two or more logics that can be competing or conflicting (Reay & Hinings, 2009). It is important here to make the distinction between institutional logics in the context of the organisational field and those at the macro level, which are institutional orders. The former is a theoretical lens open to uncovering different logics and belief systems in any field within an organisation and is thus flexible in its use, while the latter, as previously elaborated, has distinct ideal types that are considered the main institutional orders in societies. The institutional logics perspective allows exploration of cultural transformation in organisational fields as well as the interplay between agency and structure and is therefore a significant concept in explaining the institutional change process. In this thesis, it is mobilised to explore the extent to which contribution to social innovation is a valuable and systemic third mission activity in public universities. It is further elaborated in Paper C.

Legitimacy is another important concept in explaining the specificities of the institutional change process. It is characterised as "generalized perception or assumption that the actions of an entity are desirable, proper or appropriate within some socially constructed system of norms, values and beliefs and definitions" (Suchman, 1995, p. 574). Scott (2008) identifies three different types of legitimacy within organisations: regulative, normative and cultural-cognitive. Intertwined with institutional logics, legitimacy can be considered both a precursor and precondition of an institutional change process. This thesis benefits from the concept of legitimacy, particularly in Paper D, where it is further detailed and used to explore whether social entrepreneurship is a desirable and proper organisational behaviour in a university as perceived by field-level actors.

Lastly, the degree of institutionalisation/level of structuration is a concept through which the extent of the institutionalisation of certain practices in an organisational/institutional field can be uncovered (Fuenfscilling & Truffer,

2014). In an attempt to delve into the institutionalisation process, Tolbert and Zucker (1999) established three different stages, namely habitualisation, objectification and sedimentation, the latter being the most institutionalised and therefore the most resistant to de-instutionalisation. More information about each stage is provided in Paper E, where the concept is used to explore the extent to which natural resource-based innovations in a university within the bioeconomy sector are institutionalised. I conceptualise this theoretical lens as an indicator of the future viability of an institutional change process: it helps discover what needs to be done to make the desired change long lasting or alternatively, to trigger a de-institutionalisation process to initiate the desired change.

Overall, all these theoretical concepts collectively help explain the institutional change process, though at different levels. Critical junctures and institutional orders function at the macro level and are mutually interactive. They lay the foundations of the broader level for institutional change. The remaining five key concepts are highly intertwined and account for the manifestation of institutional change at the meso and micro levels.

3. CHAPTER 3: METHODOLOGICAL CONSIDERATIONS

3.1 Personal path to PhD and the research project

I started my academic journey by completing a Bachelor's degree in teaching at Akdeniz University (Antalya, Turkey). These types of degrees are heavily rooted within educational sciences, which include sub-disciplines of developmental and cognitive psychology, pedagogy, sociology of education and more. I am therefore a teacher by profession and training, qualified to teach a wide range of levels from primary school to higher education. The path to become a teacher for such a wide range of educational levels required delving into various key concepts—such as classical and operant conditioning, learned helplessness and contiguity—that are relevant to both minors and adult learners. Each one might address different issues but all (and many more key concepts within educational sciences) had one concern in common: the impact of structure and environment on learning and teaching. I therefore developed a greater sensitivity towards structures, institutions and the built environment throughout my undergraduate years.

Upon graduation, I decided to pursue a Master's degree where I would be able to work on a topic that lies at the nexus of educational sciences and regional and urban planning, a discipline that I was interested in at the time. I was curious to find out whether the different socioeconomic status of neighborhoods cause school principals to display different leadership behaviours. Thus, I completed a Master's degree in Educational Administration and Planning at the Middle East Technical University (Ankara, Turkey) and wrote a thesis on this topic. The period covering my Bachelor's and early Master's years, 2008-2013, coincided with the growing visibility of economically successful intermediate cities in Turkey, referred to as Anatolian Tigers. Coming from Siirt in Southeast Anatolia, a small city that can be characterised as a periphery within a periphery in the Turkish context, I became increasingly interested in their economic successes. In the meantime, I partook in the Erasmus exchange programme and spent two semesters abroad, first at the University of Presov, Slovakia and then at the

University of Augsburg, Germany. Therefore, I had the opportunity to observe different higher education systems and became more enthusiastic about pursuing a PhD abroad. All these interests converged and ultimately led to my application to several PhD programmes with the research theme of universities and regional development. Among them, there was the Marie Sklodowska-Curie research position within the Role of Universities in Innovation and Regional Development (RUNIN) project at the University of Aveiro in Aveiro, Portugal. I was hired and started working as a research assistant (*investigador)* at the University of Aveiro.

RUNIN is a European Commission funded Horizon 2020 Marie Sklodowska-Curie Actions (MSCA) Innovative Training Network (ITN) project that focuses on how universities can better contribute to innovation-led regional development, particularly in peripheral areas. It consists of seven partner universities across Europe. During my three years of employment at RUNIN, I spent two secondments—three months each—at the University of Twente in Enschede, the Netherlands and at the European Consortium of Innovative Universities at Enschede, the Netherlands for fieldwork. RUNIN included four work packages: "People and Networks," "Places and Territories," "Policies and Interventions" and "Practices and Governance." This PhD project was embedded within the last one. Initially, I started my PhD at the University of Aveiro; however, my former supervisor, Paul Benneworth, passed away unexpectedly. Western Norway University of Applied Sciences (HVL) in Bergen, Norway, the institution Paul was working at while supervising me, provided me with the opportunity to continue my work at the Mohn Centre for Innovation and Regional Development.

Thanks to its structure encouraging mobility (e.g., secondments, training weeks with each partner, mid-term seminars, etc.) and interdisciplinary orientation (innovation studies, regional studies, higher education studies), RUNIN has contributed tremendously to my academic and professional development and socialisation into becoming a regional studies scholar. The courses I have taken at HVL within the PhD programme—"Responsible Innovation" and "Regional Development"—discussions and collaborations

with my current supervisors—Lars Coenen and Dzamila Bienkowska—departmental seminars and meetings with other fellow PhD researchers at Mohn Centre for Innovation and Regional Development have further deepened my knowledge base on innovation and regional development, thereby contributing significantly to my aforementioned disciplinary socialisation. Overall, this thesis is admittedly influenced by all of these experiences, interactions and academic backgrounds.

3.2 Philosophical approach

Institutional change in universities is a highly complex phenomenon. There are several dimensions, such as temporality, place-specific factors, involved actors and their potentially different belief systems, as well as internal and external shocks. It takes a significant period of time and may even still not be fully completed. Meanwhile, actors perceive the events differently and feel the need to intervene or mobilise their capacity to influence the change trajectory. In this sense, institutional change in universities is a process in institutionally complex systems. Similar to other complex systems, it is largely open and includes different perspectives on the complexity experienced by actors of such systems (Cilliers, 2005). It is about the transformation of actors within the entire university system and the broader societal environment within which a university operates.

Due to highly subjective experiences that are difficult to capture without getting involved in them, one can argue that this doctoral project is implicitly situated within relativist ontology. Accordingly, the epistemological paradigm would be subjective as interaction with actors is necessary to capture the truth. Although relativist ontology has a lot to offer in terms of subjectivity inherent in knowing the truth, I believe that reality is ultimately autonomous from human knowledge and exists independent of whether we experience it partly, fully or not at all. This leads to the judgment that a relativist ontology resulting in epistemic relativism is too mechanical, strict and pre-determined, as the social world is far more complex and stratified. This further necessitates a renewal of focus on ontology with regard to the subjectivity of truth and reality and thus inevitably opens the window for critical realism.

Critical realism argues that social sciences are significantly different from natural sciences: they are not only empirical but also theoretical (Bhaskar, 1975). Departing from a post-positivistic perspective, it refuses to adhere to a strict empiricist orientation inherent in positivism as well as to an overemphasis on language within social constructionism; it rather mobilises strong arguments from both while avoiding pitfalls inherent in either paradigm (Sayer, 1981). It does that through three core elements: ontological realism, epistemic relativism and judgmental rationality (Bhaskar, 1975). With ontological realism comes the autonomy of reality irrespective of human perception and knowing, while epistemic relativism offers the notion that human knowledge is contextual, fallible and finite (Bhaskar, 1975). The concept that binds the two is judgmental rationality, which suggests the necessity of an assessment of diverse and competing interpretations of the social world (Bhaskar, 1975).

Critical realists argue that there should be a distinction between three layers of the social world: the empirical (experience, observation and data), the actual (events and regularity of human experience) and the real (mechanisms and structures that generate the events and regularity of human experience) (Bhaskar, 1975, p. 56). In this sense, it is necessary to shift between these three domains during research to find the truth (Sayer, 1981). Table 6 summarises the three ontological dimensions and how they construct overall reality.

Table 6. Three ontological domains and their populating entities

	Domain of real	**Domain of actual**	**Domain of empirical**
Mechanisms	X		
Events	X	X	
Experiences	X	X	X

Source: Bhaskar (1975, p. 56)

With this table, Bhaskar and Lawson (1998, p. 5) suggest that "reality is constituted not only by experiences and the course of actual events but also by powers, mechanisms and tendencies—by aspects of reality that underpin, generate or facilitate the actual phenomena that we may (or may not) experience." This approach leads to a different understanding of causality suggested by critical realism compared to other philosophical stances (Moghadam-Saman, 2019).

Critical realists argue that the real world has causal powers and in circumstances when they are triggered, they result in the creation of events (Elder-Vass, 2010; Sayer, 1981). Elder-Vaas (2010) proposed the concepts of the abstracted level and laminated view to understand the dynamic causal relationship between mechanisms, events and experiences in a system. The abstracted level view is about "the effects of the whole entity in isolation from the existence or effects of its parts," while a laminated view plays out when a whole entity is regarded as "a stratified ensemble of parts at various ontological levels" (Elder-Vaas, 2010, p. 49). As such, Elder-Vaas (2010, p. 50) argues that "the total causal impact of a higher level entity, conceived of in these laminated terms, then, includes the impact of all its lower-level parts as well as the causal powers that are emergent at its highest level." Consequently, to understand the causal relationships within a social system, attention should be paid both to the effect of one specific mechanism on empirical regularities and the impact of interacting mechanisms (causal powers) on the generation of events or phenomena, two complementary processes referred to respectively as retroduction and retrodiction (Lawson, 1997).

Critical realists also claim that the law model of causation of natural sciences is not sufficient in explaining causal relationships in social sciences that are situated within complex overdetermined constellations (Elder-Vaas, 2010). Thus, the concept of tendency has been suggested: when multiple causal mechanisms are activated, they tend to generate certain outcomes (Bhaskar, 1975). A mechanism can be triggered "yet generate no events at all" (Fleetwood, 2001, p. 15). This might prevent individuals from experiencing it in the empirical domain, thereby making it difficult or impossible to observe.

Nevertheless, it should be noted that a mechanism might not necessarily generate certain outcomes "but [it] always tend[s] to" (Fleetwood, 2001, p. 10) and is ready to increase the intensity of its causal powers when and if joined by other triggered mechanisms in a conducive conjuncture.

Recently, the interest of regional scholars in critical realism has increased. Moulaert and Mehmood (2010, p. 108) claim that territorial innovation models (e.g., innovation milieu, industrial district, regional innovation systems and new industrial spaces) "suffer from ontological and epistemological reductionism: they use idealized categories in the analysis of the structural and institutional dynamics of the past, hence short-cutting the causality relations between agency-institutions-structure." An outcome of this, as they argue, has been insufficient historical and territorial contextualisation of events and social relationships as well as missing links between the supranational, national and regional. They therefore claim that departing from the critical realist perspective allows for the exploration of causal mechanisms emanating from the supranational and national while at the same time making regional studies work territorially more sensitive and capable of better capturing the complex relationships between actors and institutions. Along the same lines, Gong and Hassink (2020) suggest that economic geographers can and should mobilise a critical realist perspective to engage in re-theorising, thereby refining some key concepts such as related variety and knowledge bases. They argue that previous research has focused on replicability of key concepts across different geographical scales and that critical realism can instead be helpful in uncovering the conditions under which these key concepts manifest and establish causal mechanisms. Furthermore, in the case of economic geography, Asheim (2020) claims that its relevance to policymakers and broader society, particularly in Europe, has become possible thanks to "a strong ontological core of doing contextual analysis," a tradition that he argues should continue. A critical realist perspective provides fertile ground for this contextual analysis to take place. Overall, critical realism is a highly relevant philosophical stance to depart from due to its context sensitivity. In the conclusion chapter, I will use critical realist terminology to identify key factors exerting influence over the

institutional change process: societal-level structures (institutional orders), interplay of underlying causal mechanisms emanating from these structures, and events stemming from these mechanisms and experienced by individual actors in universities.

3.3 Research design

In this thesis, I aim to elaborate on institutional change in universities in the form of transformation from the entrepreneurial to the engaged model. As such, I needed to identify universities that define themselves as entrepreneurial and yet show strong interest in transforming into the engaged model. This necessitated the adoption of a qualitative case study design with comparative research methodology. Case studies are appropriate "when [the] researcher has a case bounded by time or place that can inform a problem" (Creswell et al., 2007, p. 241). Comparative research in higher education helps researchers make more informed choices as well as detailed comparisons and increases the trustworthiness and reliability of the results (Kosmutzky & Nokkala, 2020). Together, these two provide a rich account of the phenomenon being studied and allow the exploration of causal relationships (Yin, 2003).

Multiple case study designs in particular are helpful in uncovering and navigating situational complexity as they allow the comparison of themes—and by extension, the phenomenon being studied—across cases (Stake, 2006). I therefore selected two entrepreneurial universities that aim to transform into the engaged model, namely the University of Twente (UT) in the Netherlands and the University of Aveiro (UA) in Portugal (see subsequent section for characteristics of these cases) to examine and find answers to my research questions. As such, the case study is the main research design of this thesis, forming the methodological basis of Papers B, C, D and E. Paper A, on the other hand, uses the Gioia methodology, which relies on grounded theory and aims at systematic construction and/or revision of a certain concept (Gioia et al., 2013), namely "innovation within the European Union" in the context of this thesis. While not framed within a case study, Paper A identifies a factor—the evolving conceptualisation of innovation—that enables and

constrains certain aspects of the institutional change process in these cases. Both the nature of this research and a departure from the critical realism perspective meant that I could not be bounded by either inductive or deductive approaches alone, as they complement each other in arriving at meaningful causation and conclusion. Thus, Papers B, C, D and E follow deductive reasoning with the consideration of different strands of the institutional theory while Paper A adopts inductive reasoning. The thesis as a whole, on the other hand, employs abduction (see Table 8 in the conclusion chapter) and retroduction (see Sections 5.2 and 5.7).

3.4 Overview of case studies

The University of Twente is a technical university established in 1961 and located in Enschede, Twente region, Eastern Netherlands. The University of Aveiro is also a technical-oriented university established in 1973 and located in Aveiro, Aveiro region, in central-coastal Portugal. There are a number of similarities between the two universities: they are both public universities, young and were established with the mission of contributing to the revival of declining industrial regions. They are both located in less-developed regions of their respective countries and can be characterised as peripheral either within a national (UT) or European (UA) context. In addition, they are both characterised as entrepreneurial and are members of the European Consortium of Innovative Universities (ECIU). Furthermore, both universities have come under pressure from multiple stakeholders to increase the scope and volume of their regional engagement activities as well as the range of societal partners they collaborate with. As a result of these pressures, they have started to find ways to increase their regional impact, particularly in social contributions, as exemplified by a growing attention to fostering social innovation in their geographic vicinities. Some of the societal challenges they are expected to address, such as ageing and gender inequality, are also similar.

Nevertheless, the two universities also have differences. While UT is academically organised around five faculties, UA does not have faculty structures but rather sixteen autonomous departments. In addition, both universities have somewhat different research clusters they excel in: while UA

has lots of experience in the field of bioeconomy, UT has research clusters that specialise in digital society and the philosophy of technology. They are also located in regions that face some societal challenges that do not necessarily resemble each other. The Twente Region has felt the impact of the refugee crisis and refugee and immigrant integration is a significant issue that needs to be addressed. UT has been expected to support the economic and social integration of refugees and immigrants into the region. In comparison, the Aveiro Region is not faced with a refugee crisis but rather rural depopulation and severe austerity. UA has been expected to expand its regional engagement beyond the city of Aveiro into rural areas and contribute to addressing the negative impact of austerity in the Aveiro region in innovative ways. Overall, these similarities and differences in characteristics of both universities (which are further elaborated in Papers B, C, D and E) and the regions in which they are located, which will be introduced in the following chapter, make them highly relevant cases for examination.

3.5 Research methods

The data utilised in this thesis were 73 semi-structured interviews (Papers B, C, D and E), 346 policy documents (Paper A) and 18 relevant key documents (Papers B, C, D and E). The policy documents were extracted from the European Union and European Commission databases by filtering for the keyword "innovation." I did not use another keyword to accompany innovation because I intended to have a broad understanding of innovation ranging from the technological to the social. Initially, both databases provided 3,194 documents in total; however, I applied 12 criteria to eliminate irrelevant ones, which resulted in 346 documents providing information about innovation in the European Union. I then searched the keywords "innovation/innovate" and "universit(ies)/higher education" to explore the understanding of innovation in the EU and institutional demands on European universities. I used the Gioia methodology, which relies on inductive reasoning (Gioia et al., 2013), to reconstruct the conceptualisation of innovation in the European Union as well as the characteristics of innovation-related demands on European universities. Further information about the filtering process and policy documents is provided in Paper A.

Seventy-three semi-structured interviews (64 face-to-face and 9 online using video chat) and 18 relevant documents, such as the strategic plans of both universities and regional and national innovation strategies, were used in Papers B, C, D and E, 61 of which were conducted individually while 12 were carried out together with other RUNIN PhD fellows. Thirty-eight of these interviews were conducted at the University of Twente, while the remaining 35 were carried out at the University of Aveiro. Semi-structured interviews were helpful in gaining insights into different perspectives on established problems as well as in the emergence of unexpected dimensions (Bryman, 2016). The interviews were conducted with key university and regional actors—rectors (including former ones), vice rectors, pro-rectors, academic staff, administrative staff, executive board members, managers of science parks and technology transfer offices, mayors, regional councils and agency employees, intermunicipal association employees, managers of regional firms and a few key PhD researchers—between November 2017 and September 2019. The duration of the interviews ranged from approximately 30 to 90 minutes. Further information about the interviews, analysis and sampling procedure is provided in Papers B, C, D and E. An overview of the research design, approach and methods employed in each paper is provided in Table 7.

Table 7. Summary of methodological characteristics

Papers	Research Design	Research Approach	Research Method
Paper A	Quasi-grounded theory*	Inductive	346 policy document analysis
Paper B	Single case study (UT)	Deductive	29 semi-structured interviews + relevant documents
Paper C	Multiple case study (UT & UA)	Deductive	36 semi-structured interviews + relevant documents
Paper D	Single case study (UT)	Deductive	17 semi-structured interviews + relevant documents
Paper E	Single case study (UA)	Deductive	24 semi-structured interviews + relevant documents

*I charactherised it as quasi because I did not aim to develop a theory of innovation but rather explored its overall conceptualisation and constructed compatibility/tensions between different conceptualisations.

4. CHAPTER 4: NATIONAL AND REGIONAL CONTEXTUAL FRAMEWORKS

This section provides an overview of the institutional context of the higher education system in the Netherlands and Portugal, as well as the regional characteristics of Twente and Aveiro.

4.1 The Dutch higher education system

Higher education in the Netherlands can be characterised as a binary system (de Boer et al., 2007), consisting of 13 research universities (*universiteit*) and 36 universities of applied sciences (*hogeschool*). The age of research universities ranges from 446 years old (Leiden University) to 45 (Maastricht University). Ten of these are public, while the remaining three are private yet publicly funded (de Boer et al., 2007).

Since the 1970s, the public sector in the Netherlands has undergone significant changes due to reforms entailing privatisation, budget cuts and deregulation (Pollitt & Bouckaert, 2000). Higher education has been one domain of the public sector considerably affected by these reforms. Starting in the 1980s, new governance approaches such as "new public management" permeated the Dutch higher education system (Kickert, 1997). The new public management approach requires constraining public budgets while simultaneously maintaining a plethora of demands, thereby encouraging public organisations to behave like businesses in order to reduce costs and increase efficiency (Hood, 1991). In 1985, "steering at a distance," a paradigm whereby governments provide universities with more autonomy in return for establishing the boundary conditions under which they function, arrived in the Dutch higher education system (Goedegebuure et al., 1994). Moreover, a government policy report published in 2005 proposed privatisation of public universities to enable them to adopt corporate rationality (Wetgevingsnotitie, 2005). The corporatisation of universities was further fueled by rankings that emerged in the early 2000s. All these developments are ramifications of new public management that have gradually transformed the universities in the Netherlands into corporate actors (Capano, 2018; de Boer et al., 2007).

Overall, Dutch public universities have been facing the strong pressures of institutional profiling and better performance in rankings and identity differentiation. More recently, contributions to the knowledge economy and regional development have been added, which has led to a tremendous stretch of their missions (Enders & de Boer, 2009).

4.2 The Portuguese higher education system

Similar to that of the Netherlands, the Portuguese higher education system also involves a duality: it is comprised of 21 universities (*universidade*) and over 80 vocational and profession-oriented schools (*politecnico* and *escola superior*). This duality has also produced a unique hybridity whereby some universities (e.g., the University of Aveiro) also possess vocational and profession-oriented schools within their formal organisational structure. Thirteen of these 21 universities and 20 out of the 80 vocational and profession-oriented schools are public. Portugal has one of the oldest public universities in the world, dating back to 1290 (the University of Coimbra), as well as one of the youngest, established in 1988 (the University of Madeira). Most of these higher education institutions were founded after the Carnation Revolution in 1974, which resulted in a transition to democracy.

Following the massification of higher education, Portuguese universities had, until the late 1990s, been governed by "principles based on collegiality and a democratic system of elected academic representatives" (Carvalho & Videira, 2019, p. 3). In the late 1990s, the new public management approach started to influence universities (Santiago et al., 2006). Furthermore, the knowledge economy narrative was commonly used to trigger some other changes, such as expanding the missions of universities in the early 2000s (Carvalho & Videira, 2019). In 2007, a new regulation known as *Regime Jurídico das Instituições de Ensino Superior* (RJIES) passed and it provided higher education institutions with a legal regime (Diario de Republica, 2007). RJIES provided a legal framework for the changing higher education practices and governance triggered by the new public management paradigm and knowledge economy narrative. One of the main impacts of RJIES has been the increasing role of external stakeholders—mainly industry—in the governance bodies and

executive boards of universities (Carvalho & Bruckmann, 2014). What started as an expectation from universities to play a key role in strengthening national competitiveness was later enlarged to encompass the demand for regional contribution and a proactive role in regional innovation systems. More recently, Portuguese universities have also been under the influence of league tables and have been expected to rise higher in the rankings (Horta, 2010). Similar to the Dutch case, the changes driven by new public management and taking place over the past two decades have placed enormous pressures on Portuguese universities at multiple levels, paving the way for corporate-like behaviour and organising.

4.3 Regional characteristics: Twente and Aveiro

The Twente Region is located in Overijssel Province in the Eastern Netherlands (see Figure 1). It borders Germany, has a population of approximately 620,000 and is composed of 14 municipalities with the number of inhabitants ranging from 21,000 (Tubbergen) to 158,000 (Enschede). Historically, it was an industrial region with textiles as the main economic sector up until the 1960s. Since then, the textile industry has gradually declined. Currently, the main economic activities center around services, ICT, agriculture and manufacturing. Twente is generally characterised as a less-developed or peripheral region within the Dutch context (Benneworth & Pinheiro, 2017).

Figure 1. Geographical location of Twente in the Netherlands. Source: ITC (2005) (courtesy: faculty of ITC, University of Twente).

The key actors in regional innovation and development are higher education institutions (e.g., the University of Twente and the Saxion University of Applied Sciences), governmental bodies (e.g., the City of Enschede and Overijssel Province), other regional agents (e.g., Kennispark and Twente Board) and a variety of companies (Nieth, 2019). More information about these actors and the Twente region is provided in Papers B, C and D.

The Aveiro Region is located in central Portugal along the Atlantic coast (see Figure 2). It has a population of approximately 370,000 and is comprised of 11 municipalities with inhabitants ranging from 10,500 (Murtosa) to a bit over 78,000 (Aveiro). Between the early 1970s and late 1990s, the primary industrial sectors were agriculture, clay extraction, fisheries and forestry (Fonseca et al., 2021). Since then, the industrial structure has evolved to include chemical, metallurgy, food, non-metallic minerals, automobiles, advanced forestry, ICT, petroleum derivatives, ceramics and tourism sectors (Fonseca et al., 2021; Rodrigues & Teles, 2017).

Figure 2. Geographical location of Aveiro (11 municipalities) in Portugal. Source: Fonseca (2019).

While it is a heavily industrialised region—mostly with SMEs—within the Portuguese context, Aveiro is still characterised as less-developed by European Commission indicators and peripheral within the European context (Nieth & Benneworth, 2020). Similar to the Twente region, the key stakeholders in regional innovation and development are higher education (the University of Aveiro), local governmental bodies (e.g., the intermunicipal community of Aveiro, Aveiro municipality, etc.), other regional actors (e.g., the Industrial Association of Aveiro) and multiple firms. Further information about these actors is provided in Papers B and E.

5. CHAPTER 5: RESULTS AND DISCUSSION

This section includes a summary of the findings detailed in the five papers composing the thesis, answers to the research questions and a discussion on the underlying causal mechanisms impacting the institutional change process of the two universities.

5.1 Summary of the findings

Paper A, titled "Changing conceptualization of innovation in the European Union and its impact on universities: critical junctures and evolving institutional demands," demonstrates that understanding of innovation has changed significantly over the past four decades. It points to three specific periods, each with a different set of dynamics that built the momentum accounting for this change, that is, the broadening of the innovation concept: 1983-1986 (economic, social and political integration of Europe), 1995-2000 (transition from industrial to information society) and 2008-2012 (the shift towards a place-based approach). It concludes by arguing that this broadening involves tensions between different conceptualisations of innovation, which have also impacted universities, leading to articulation of incompatible institutional expectations.

Paper B, titled "Universities' contribution to culture and creativity-led regional development: conflicting institutional demands and hybrid organisational responses," discusses how the University of Twente has navigated a complex institutional environment. It demonstrates that UT has formulated a hybrid response strategy to meet the incompatible demands of contribution to culture- and creativity-led regional development and mission differentiation. Furthermore, the results show that the hybrid strategy formulation was very much dependent on both the internal dynamics of UT, peripheral characteristics and external expectations. These factors were a) a fragmented and moderately centralised field of higher education, b) the nature of demands lying at the means-level, c) an unbalanced internal representation of demands and d) formulation of compromise strategy to at least partially satisfy both demands.

The overarching finding was that the perceived organisational identity influenced each of these dimensions and led to the hybrid response. As such, in the culture and creativity sphere, UT invested largely in responding to the sub-demands of collaboration with cultural and creative industries and to the attraction of the creative class. The utilisation of culture for the well-being of residents—another sub-dimension—was met in part, while efforts to fulfill the remaining two sub-demands—mobilisation of culture for tourism promotion and contribution to culture-led urban regeneration—were minimal. In the mission differentiation (institutional profiling) sphere, increasing the quality of teaching and research and investing in talent attraction received the most attention, while differentiating the university profile, degree programmes and research themes were only met in part. In addition, investment in talent generation and retention were found to be minimal.

Paper C, titled "Why do universities have little systemic impact with social innovation? An institutional logics perspective" uncovers the institutional logics and field-level dynamics with regard to social innovation in both UT and UA. The article displays that in UT, the two dominant institutional logics in the field are high technology and global excellence, referring to the technological orientation of the university as well as most of its members, and its international and global focus, respectively. In UA, competition between the engineering and design logics—two different belief sets approaching the third mission and social innovation differently—shaped the organisational field and, by extension, the contributions to social innovation. In UT, social innovation was not ingrained in any of the logics. In UA, while design logic was a proponent of social innovation, it still lay under the shadow of the more powerful engineering logic.

Paper D, titled "Delving into social entrepreneurship in universities: is it legitimate yet?" elaborates on the legitimacy of social entrepreneurship in UT. It shows that while regulative legitimacy for social entrepreneurship can be found in UT, cognitive-cultural legitimacy has not yet been established. In other words, while academics are absolutely not forbidden from engaging with social entrepreneurship, the organisational environment is constructed in a

way that makes them perceive it as neither a priority nor one of the most valuable and desirable actions expected from them. There are four main factors determining this process: a) the expectation of stakeholders (mainly economic and measurable) and the difficulty of measuring social impact and third mission indicators (quantifiable), b) overemphasis on high-tech research and application as an organisational identity, c) the absence of a leader for social entrepreneurship in the field and its lack of organisational recognition and d) stringent regulation of public institutions in the Netherlands, which makes long-term inter-organisational collaboration difficult. Additionally, the lack of place-based belonging among UT students hinders the emergence of student social entrepreneurs.

Paper E, titled, "Structuration of natural resource-based innovations in universities: how do they get institutionalized?" portrays the 28-year journey of bio-economy activities within UA. Specifically, it explores the contributions of UA academics to the valorisation of natural resources (mainly marine and forest). It identifies three phases, namely habitualisation, objectification and sedimentation, the latter indicating the presence of a strong and institutionalised structure supporting bio-economy activities. The article points to key factors contributing to the institutionalisation process: external actors providing legitimacy and resources (financial and human), UA contributing to the process by creating new units, establishing partnerships with big corporations supporting such activities and keeping the sustainability/circular economy discourse present across the organisational environment. However, the paper also indicates systemic challenges that pose risks for the future viability of the sedimented structure in UA. The paper therefore concludes by calling for greater attention to the economic, social and political dynamics affecting universities' regional engagement.

5.2 Characteristics of individual and organisational efforts

Earlier in the thesis, I posed the following research question: What are the characteristics of individual and organisational efforts geared towards the engaged university in a peripheral region? This section discusses efforts geared towards the engaged university that have been relatively successful.

As far as the social domain of the transformation is concerned, the academic staff at the University of Aveiro have been able to further their cause of contributing to social innovation in the region. Particularly, design scientists have been very influential in assuring that social innovation through design has a solid base within the organisational field. Despite a more powerful and conflicting engineering logic, they have been able to advance their belief systems, norms and values. They have employed three main strategies: a) using the 2008 financial crisis and the austerity following as an opportunity to drive change, b) leveraging global links located in advanced regions to legitimise change in a periphery and c) triggering organisational dynamics to create new units. More specifically, they have often made the case that more social innovation is necessary to deal with the negative impacts of the financial crisis and austerity. They then established relevant research groups, Design for Social Innovation and Sustainability, in the Research Institute for Design, Media and Culture, to make social innovation more visible organisationally and regionally. Furthermore, they mobilised their international networks located in universities/regions that are globally famous and strong in design sciences/industries. Particularly, support from international networks in Aalto University (Espoo, Finland), Tampere University (Tampere, Finland) and the Polytechnic University of Milan (Milan, Italy) has been important in securing management of certain key units in the university, as shown in Paper C, as well as appealing to the regional actors who appreciate the mobilisation of design and arts to tackle regional societal challenges.

As for the cultural domain, the University of Twente's relative success is rooted in the ability of regional actors to exert influence over the university, UT's institutional profiling and a certain aspect of Dutch culture and society, namely, extensive consensus-based decision-making and strategy formulation. Various regional actors have established a common vision, transforming Twente into a high-tech region and thus, they are still able to exert a great deal of influence over UT despite being located in a peripheral region with a presumably weak institutional landscape. This results in UT

positioning itself accordingly to respond to multiple demands and engage in institutional profiling. It is a high-tech research-intensive university, which itself is an outcome of university and regional actors' desire to catch up with similar universities and advanced regional counterparts, namely the Delft University of Technology (Delft) and Eindhoven University of Technology (Eindhoven). Within this context, university actors prioritise certain culture- and creativity-related sub-demands (cultural and creative industries, attracting the creative class), as shown in Paper B. The Dutch consensus culture comes to play a role at this stage. In sum and in a rather simplified manner, the Dutch decision-making and strategy formulation differs from other consensus-based processes in that it does not necessarily find a balance between white and black, which would be a shade of grey and something neither side might be content with. Instead, it ensures that even if one side's arguments prevail, the interests of the other are also met significantly. This is reflected in UT creating space for culture- and creativity-oriented academic staff to establish their own professional identity and research interests in relation to institutional profiling. A key factor driving this consensus is that the nexus of digital technologies and cultural/creative industries is indeed a recently emerging field both academically and professionally with potential to grow in the future.

Within the environmental domain, UA's relative success is driven by organisational efforts to secure key partnerships and collaborate with extensive societal stakeholders to drive natural resource-based innovations and actors' constant embedding of the circular economy, bioeconomy and sustainability into strategies, discourses and overall organisational identity and culture. In particular, the official partnership with the state bank Caixa Geral de Depositos in establishing a research chair on Economy of the Sea in 2011 was quite entrepreneurial and unique within the Portuguese higher education context. This was further reinforced by securing another partnership with the biggest pulp and paper company of Portugal and one of the biggest in Europe—The Navigator—in establishing another research chair in biorefinery/bioeconomy. In addition, university actors have also started collaborating with non-firm partners, such as the fisherman association and

cooperatives, in order to include broader society in research and innovation processes. This has been quite challenging, as elaborated in Paper E, but UA has been slowly accumulating significant experience in collaboration with atypical partners. Furthermore, university actors have also frequently kept the discourse of the bioeconomy, circular economy and sustainability as a high priority, highlighting these in strategic plans, meetings and public relations. This has been crucial in getting other departments, especially in the social sciences, involved in bioeconomy activities in addition to the usual suspects: chemistry, biology and environment and planning.

5.3 Conditions enabling the institutional change process

The second question I posed earlier was: Under what conditions can universities located in peripheral regions transform from the entrepreneurial to the engaged university model? In this section, I will elaborate on these conditions at the macro (broader environment in which universities operate), meso (organisational field of universities) and micro (academic staff) levels that enable an institutional change process within the two universities.

At the macro level, universities must have the wind at their back. In other words, there should be a conjuncture of particular developments that synchronise with the nature of the change and grant legitimacy to the actors aiming to trigger the change. With its generative cleavage, the shift towards a place-based approach, as shown in Paper A, has been a highly relevant wind with which universities can sail. It enables triggering a transformation into the engaged university model by a) formulating demands in environmental, social and cultural dimensions and thus providing legitimacy, b) highlighting the importance of other types of innovation (e.g., social, environmental etc.), c) mobilising greater financial resources (e.g., structural funds) and d) generally opening the window of opportunity for change.

Again at the macro level, there must be coherence between the European, national and regional visions and expectations. This can play out in two different ways, though: either by facilitating the institutional change or hindering it. Paper E shows that the expectations in the sphere of the

bioeconomy are quite explicit and clear at the European, national and regional levels in the case of UA and both national and regional visions demand the bioeconomy sector be at the core of the Aveiro region. On the contrary, Paper D demonstrates that UT's prioritisation of economic and technological contributions over social ones is partly caused by regional stakeholders' vision of transforming Enschede into a high-tech hub. Accordingly, to avoid such a situation, I argue that regional visions must always lie in a state towards which universities are expected to transform: if regional stakeholders expect universities to pursue the engaged model, their vision and expectations should then also be based on the engaged rather than the entrepreneurial model.

At the meso level, universities must have an organisational identity that resonates with external institutional demands. A relevant organisational identity can already be available when external demands prevail, or alternatively, it can evolve over time in the direction of these demands to accommodate them. The emergence of a sedimented structure supporting natural resource-based innovations within UA, which is elaborated in Paper E, is possible due to such activities aligning with its organisational identity. In the case of UT (discussed in Paper B), organisational identity comes into play in prioritising some sub-demands (e.g., cultural and creative industries) of contribution to culture- and creativity-led regional development over others. As such, I argue that organisational identity accounts for a significant part of institutional change process towards the engaged university model.

In a similar vein, universities must entail relevant and supportive institutional logics that can guide the behaviour of field actors towards the engaged university model. Paper C demonstrates that the lack of supportive logics regarding social innovation in UT is one reason why its contribution in this domain is rather sporadic and mostly dependent on a few individual initiatives. Similarly, although there is a relevant logic (design) to support social innovation in UA, it is still newly emerging and under the shadow of a stronger logic (engineering), which also hinders its systematic contribution. However, it is important to note that the field is open to competition in UA. Therefore, I argue that if universities do not possess supportive logics for

social contributions, the field should be open to the coexistence of different logics so that relevant ones emerge gradually over time.

At the meso level, there must be legitimacy for expected contributions within the organisational environment. Focusing on the case of social contributions in the form of social entrepreneurship within UT, Paper D reveals that it is insufficient to have only regulative and/or normative legitimacy. Cultural-cognitive legitimacy is also a necessary condition to drive change towards more social contributions, as shown by the UA case. It is driven by design scientists' efforts and strategies to legitimate social innovation. University actors—both academic and administrative staff—must perceive their social contributions to regional development as also desirable, valuable and appropriate.

At the micro level, there is a need for stable academic identities that will champion and drive change towards the engaged university model. As elaborated in Paper C, there is a lack of stable academic identities, particularly in driving social contributions to regional development. More specifically, many academic staff in both universities have developed their identities within the context of the entrepreneurial university, which can be difficult to de-institutionalise. Nevertheless, it is clear that a different academic identity regarding regional engagement or evolution of the current academic identities to accommodate change towards the engaged university model is needed.

Another necessary condition at the micro level is the ownership of a particular third mission activity by a heterogeneous number of actors from different disciplines. Efforts across several disciplines, particularly engineering, technological and social sciences, are important to institutionalise a certain engagement behaviour. Paper E shows that this is the case with bioeconomy activities in UA as natural resource-based innovations reached a sedimentation phase only after other disciplines started contributing. Moreover, Paper B also reveals that the hybrid organisational response to culture- and creativity-led regional development in UT was partly possible because culture- and creativity-oriented academic staff were able to find an

academic niche within the hybridity and they were given the opportunity to develop research and engagement practices as well as new academic identities based on this niche, which is well-aligned with UT's institutional profile. It is important to note that the motivation to begin co-ownership of a certain third mission activity might naturally be quite different for actors coming from different disciplines. Ultimately, what matters is that they have an interest in maintaining a certain practice and reaching a consensus in its institutionalisation.

Lastly, universities must also have the organisational agility to respond to external demands. Unlike the use of the term in business administration literature, I here refer to an organisation's ability to respond to external pressures not necessarily driven by market conditions but a changing institutional environment. In other words, universities must be able to create new units if necessary and mobilise their academic staff to transform into the engaged university model. In this respect, it can be argued that both UT and UA have been almost punching above their weight by creating new units (e.g., design lab in UT and technological platforms in UA), establishing partnerships with relatively new societal actors (e.g., municipalities) to contribute to regional development and benefiting from the engagement skills of their academic staff. Table 8 sums up the list of all the enabling conditions.

Table 8. List of conditions enabling institutional change

Conditions	Level
Relevant conjuncture of particular developments	Macro
Coherence among European, national and regional visions and expectations	Macro
Supportive organisational identity	Meso
Relevant and supportive institutional logics	Meso
Regulative, normative and cultural-cognitive legitimacy	Meso
Stable and relevant academic identities	Micro
Adoption of a university activity by heterogeneous actors and disciplines	Micro
Organisational agility	Meso and Micro

5.4 Challenges of institutional change

The third question I raised was: What are the institutional and organisational challenges universities face while transforming from the entrepreneurial to the engaged university model? Table 9 lays out the challenges of such an institutional change process accumulated from the five papers. Some of these challenges emerge due to the absence or only partial fulfillment of conditions detailed in the previous section.

Table 9. Institutional and organisational challenges of transforming into the engaged university model

Challenges	Relevant Case
Tensions between different conceptualisations of innovation	UT & UA
The dominance of techno-economic conceptualisation of innovation and related demands on universities	UT & UA
Increasing innovation-related demands on universities	UT & UA
Balancing institutional profiling with regional relevance	Mostly UT
Lack of stable academic identities	UT & UA
The dominant institutional belief that engagement should be with business	UT & UA
Urgent economic needs	UT & UA
Weak state of social sciences	Mostly UT
Absence of cultural-cognitive legitimacy for social contributions	UT & UA
Techno-economic oriented expectations from external stakeholders	UT & UA
Difficulty of measuring social impact	UT & UA
Quantitatively oriented third mission indicators	UT & UA
Over-emphasis on high-tech as an organisational identity	Mostly UT
Absence of a leader for social contributions	Mostly UT
Lack of organisational recognition for social contributions	UT & UA
Difficulty of inter-organisational collaboration	UT & UA
Lack of place-based belonging among student body	UT
Instability in level of funding in grants provided by external organisations	UA
Financial regulations regarding organisational spending	UA
Different expectations and motivations of universities and firms in collaboration	UT & UA
Slow internal decision-making process within universities	Mostly UA
Scientific publications still being the main benchmark for promotion	UT & UA
Financial crisis, economic uncertainty and ongoing severe austerity	Mostly UA
University rankings	UT & UA
Demographic characteristics of academics for certain engagement activities	UA
Lack of strong institutional logics for social contributions	UT & UA
Difficulty of cooperating with non-industry partners (e.g., municipalities, non-governmental organisations)	UT & UA

The institutional and organisational attributes of these challenges are highly intertwined. For instance, university rankings are an outcome of institutional phenomena and status competition. However, the strategies to move up in the league tables are discussed, formulated and decided internally, making it also an organisational phenomenon. As such, a distinction between the two is unlikely within the context of this thesis.

5.5 Impact of institutional orders on change

I introduced the seven institutional orders shaping societies earlier in the theoretical framework. In this section, I will highlight the manner in which five of them impact transformation from the entrepreneurial to the engaged university model.

5.5.1 The state

Starting in the mid-1980s, neoliberal ideas have increasingly been incorporated in both the Netherlands (Karsten, 1999) and Portugal (Teles, 2015). This has manifested itself through privatisation, deregulation, budget cuts and austerity. The Portuguese government accepted the implementation of austerity measures in return for a bailout worth €78 billion in 2010, which then represented around 33% of the country's GDP. In the Netherlands, the government introduced a package of austerity measures between 2011-2016 worth approximately €47.4 billion (Dutch Parliament, 2016). Higher education was one of the public sectors heavily affected by budget cuts in both countries, albeit more severely in Portugal. Surprisingly, this period coincided with both governments making new demands of universities, such as contributions to regional development, addressing societal challenges and differentiation at multiple levels. As such, universities in both countries have been pushed to do more with less. Overall, it can be argued that there has been a phenomenon of state withdrawal in resource provision, management and governance of various public sectors, including higher education, whilst steering it from a distance (Donina & Hasanefendic, 2019; Kickert, 1995).

5.5.2 The market

State withdrawal and its steering at a distance laid the foundation for competition in higher education. Market logic flourished among both Dutch and Portuguese universities (de Boer et al., 2007; Teixeira et al., 2012). Public universities have started searching for alternative ways of generating external income to compensate for budget cuts and pay close attention to status competition and differentiation. At the meso and micro levels, this manifested itself through pressure on publications, generation of external research funding and industry collaboration, which would presumably lead to better performance in rankings. The market as a societal-level logic has paved the way for significant governance changes in higher education.

5.5.3 The corporation

The marketisation of higher education has brought about greater influence of the corporation as an institutional order. Triggered by the new public management paradigm, corporate logic has permeated both Dutch and Portuguese higher education institutions since the early 2000s. Universities have started to display corporate-like behaviours and characteristics. In practice, this has meant the introduction of external stakeholders—particularly from the industry—into governance bodies, profit-seeking strategies, a differentiation strategy through close monitoring of the competitors (rival universities nationally and globally) and accountability indicators towards delivering public good for the region and broader society (Carvalho & Bruckmann, 2014; de Boer et al., 2007). To illustrate this, currently, UT has a presidency in addition to the rectorate. The president is generally from the industry, usually a businessman, and is head of the Executive Board, the highest managing body of UT. Similarly, UA also involves a General Council in addition to the rectorate. It is formed of 19 members, five of whom are external and not affiliated with UA and also generally from the industry.

5.5.4 The profession

As they are two universities expected to contribute to regional development and be world-class, UT and UA have long formulated strategies to balance these two institutional demands. Earlier strategies from the mid-1980s up

until 2010 aimed at transforming both organisations into fully functioning entrepreneurial universities. Since 2010, both organisations have intended to be more societally relevant and thus strive to transform into engaged universities. The entrepreneurial university framework has led to the development of a related academic identity among some academic staff. Transformation into an engaged university is expected to happen without abandoning the key aspects of the entrepreneurial model. This results in a plethora of tasks academics are expected to deliver. When accompanied by institutional profiling, a group of academics experiences a mismatch between their own professional identity into which they have been socialised for almost three decades and the organisational identity of the university they are working for. On the other hand, another group of academics may seize this opportunity to finally establish their own professional identity within organisational fields. Previous studies have already demonstrated that the academic profession in Europe has been changing (Teichler et al., 2013). The case of UT and UA, however, shows that it is difficult to claim a unitary and analogous academic profession even in the same university. Disciplinary backgrounds and previous socialisation have begun to override the academic profession itself: academic staff in geography, civil engineering and design departments are first geographers, civil engineers and designers, respectively, before they can be classified as academic staff. Overall, I argue that the profession as an institutional order has found a conducive environment to re-assert itself and thus continue to influence the change process in both universities.

5.5.5 The community

The increasing number of studies evidencing that local communities account for a significant part of the way institutions and organisations evolve led to the development of community as an institutional order (Thornton et al., 2012). Indeed, the local community emerged as a key institutional order influencing the institutional change trajectory of UT and UA. In both cases, this process started with local and regional communities questioning the regional relevance and public status of the two universities, partly stemming from the discontent about their orientation towards global excellence and engagement

activities being mostly with businesses. To reclaim their legitimacy, both universities have reacted by developing partnerships with other regional stakeholders, such as municipalities, cooperatives, associations and non-governmental organisations and started to involve local residents in these collaborations since the late 2000s. Overall, I argue that the community as an institutional order has contributed to this impetus, which was necessary to encourage both organisations to transform into engaged universities. A summary of the impact of the five institutional orders on transitioning to the engaged university model through the lens of critical realism is provided in Table 10.

Table 10. Institutional orders and their influence on the change process in universities

Institutional orders	The real (mechanisms)	The actual (events)	The empirical (experiences)
The state	State withdrawal	Austerity and budget cuts	Growing number of institutional demands, increasing teaching loads and pressure to deliver the public good
The market	Status competition	University rankings	Pressure on more publications, generation of external research funding and industry collaboration
The corporation	New public management	Corporate-like behaviour	Involvement of external stakeholders (mainly business) in governance bodies, profit-seeking strategies, differentiation strategies through close monitoring of competitors and quantitative indicators for third mission activities
The profession	Balancing global excellence and regional relevance	Institutional profiling	Tension between organisational and academic identity, stretched professional identities and the impact of disciplinary backgrounds
The community	Organisational legitimacy at risk	Reclaiming the regional relevance and public status	Partnership with municipalities/NGOs /associations and more collaboration with citizens

5.6 Domains of institutional change

Departing from the laminated view of critical realism, I found that the generative mechanisms stemming from the five institutional orders and the events and experiences they tend to trigger play out differently in each domain, namely the social, environmental and cultural. The social is the most challenging domain of institutional change. While the interplay of the state and the community urges both UA and UT to be more societally relevant, some other factors (e.g., techno-economic understanding of innovation and the difficulty of measuring social impact) are strong enough to prevent such a transformation from taking place smoothly in this domain.

The environmental, as the UA case demonstrates, has been the domain where the most progress towards the engaged university model has been made. The reason for this is that both the retroduction and retrodiction processes result in enabling conditions, which then benefit universities. State withdrawal causes universities to step in to tackle environmental issues and climate change. Status competition and new public management pave the way for developing environment-related projects, which then generate income and publication for universities and strengthen their linkage with businesses. Balancing global excellence and regional relevance is possible as engaging with environment-related projects does not challenge professional and academic identities. It also helps universities maintain their legitimacy. The interaction of these five mechanisms does not result in tensions between each other either. On the contrary, they both serve their mutually respective tendencies. The transition is further facilitated by the use of high technology in most environmental research projects.

The cultural domain is the one that reflects a mixed story of the institutional change process. As the UT case portrays, there are some sub-dimensions (e.g., cultural and creative industries and attracting creative class) that universities may prefer to prioritise over others. An underlying key factor is technological and economic orientation towards regional engagement. As a result, this domain reveals a story of semi-completed institutional change towards an engaged university. Overall, this thesis demonstrates that transformation into

engaged universities has been achieved most in areas in which there is still alignment with the characteristics of the entrepreneurial model.

5.7 The engaged university in Continental Europe

The findings of this thesis indicate that the two universities analysed have not yet become fully engaged universities—though they are closer than ever before—due to the above-mentioned challenges. Nevertheless, they provide a glimpse of what such a university model looks like in Europe and what its peculiar characteristics are. In addition to getting involved in regional innovation policy formulation, as shown in other studies (e.g., Fonseca (2019) and Nieth (2019)), these two universities' engagedness lies in: a) supporting social innovation and social entrepreneurship to generate social impact and address societal challenges, particularly climate change, aging and social cohesion, b) collaborating with non-industrial partners as well to generate environmental value and foster environmental innovations and c) contributing into numerous culture-led regional development types—albeit with varying degrees of support—to have an impact on the cultural and creativity domains. They do that by collaborating with atypical partners (e.g., non-governmental organisations, a fisherman association, museums) to go beyond the purely economic and commercial interpretation of the third mission.

The parameters of the engaged university in Europe differ from its North American counterparts in that it does not engage in large real estate development projects or perceive economic development research as engagedness (see Breznitz & Feldman, 2012), of which the primary purpose is still the generation of income and contribution to economic growth in a particular neighbourhood. However, unlike its Latin American counterparts, it is not involved in providing healthcare services or establishing food banks either, as these services are already provided by other relevant institutions thanks to a relatively strong welfare state in European countries. As such, I argue that the engaged university model in Continental Europe has its own particular characteristics.

6. CHAPTER 6: CONCLUSION

6.1 Contribution to the literature and theory

This thesis resulted in a number of contributions both to the institutional approach within regional studies—particularly on the role of universities—and institutional theory. In addition, it offers novel findings for the literature.

First, in regional studies, peripheries are characterised as institutionally and organisationally thin regions (Isaksen & Trippl, 2017; Zukauskaite et al., 2017). Such a characterisation implicitly suggests that institutions and organisations have a limited capacity to impact other regional actors, such as universities, and instead, universities can and should strengthen the institutional and organisational base of such regions to foster innovation. This thesis challenges this assumption by demonstrating that universities not only influence other regional actors but are also strongly influenced by them. Regional actors, organisations and formal and informal institutions in the peripheries can also exert influence on universities and reinforce their organisational identity, which in turn shapes their regional contributions accordingly. While this particular finding concurs with the argument of Zukauskaite et al. (2017) that institutional and organisational thickness should not be conceptualised as static but rather a phenomenon that evolves over time, it also raises the critical question of whether peripheries in Western Europe can actually be characterised as institutionally and organisationally thin regions, which requires further scrutiny. In addition, previous studies have shown that universities' regional engagement can be conceptualised as institutional learning, first on how to become an entrepreneurial university, then on how they strengthen regional innovation systems (Benneworth et al., 2009; Coenen, 2007). This thesis reveals that such institutional learning processes can take place bi-directionally in peripheral regions as well.

Second, the literature delving into the role of universities in innovation and regional development has so far highlighted the interplay of two main institutional orders, namely the state and the market (e.g., Frenkel & Leck, 2017; Harrison & Turok, 2017). This thesis argues that the process is slightly

more complicated and illustrates the impact of three other institutional orders: the corporation, the community and the profession. A significant finding is that the third mission changes character when regional factors and the institutional orders of the profession and the community come into play. The two universities could claim that their third mission addresses global challenges, such as water and food shortages and climate change, through various research and global engagement activities. However, when the community and the professions and other regional factors are involved, the third mission adopts more regional and place-based attributes, which are partly reinforced by the peripheral character of both regions. The engagement activities then start to focus on regional manifestations of these challenges, such as forest fires and sustainability in the pulp and paper industry, and involve other regional stakeholders (e.g., municipalities, associations, cooperatives, etc.).

Third, universities' role in regional development is multi-faceted. While previous studies pointed to knowledge commercialisation and technology transfer (D'Este & Perkmann, 2011; Perkmann et al., 2013) and economic developmental roles regarding regional innovation (Uyarra, 2010), the findings expand these roles to contribute to the social (no matter how challenging and limited it may currently be), cultural and environmental by collaborating with regional non-industrial partners (e.g., municipalities, non-governmental organisations, museums, etc.) in order to be more relevant for regional civil society. In this regard, I argue that the emerging and one of the most important roles of higher education institutions in regional development, particularly in a peripheral region, is to trigger bi-directional institutional learning with local actors in order to change or maintain relevant belief sets, norms, values and visions to spur innovation. In other words, universities should be able to display place leadership behaviour together with other regional and local actors. This ideally requires the collective mobilisation of the agency nested within local/regional organisations and institutions (Coenen et al., 2020, Sotarauta, 2018) as well as learning from this interactive process itself to contribute to the transformation of places. Although place leadership is generally associated with change, it might also

refer to stability, that is, maintaining the rules, norms, institutions and organisation that have agential power to transform places (Bekkelund, 2021). For universities, the key to engaging with both types of place-leadership lies in developing strong and sophisticated linkages with other organisational and individual actors, various societal partners and citizens in regions in which they are located.

Fourth, while the results concur with the findings of Lazzeretti & Tavoletti (2005), who pointed out that "balancing global excellence and regional relevance" is a key factor determining university behaviour, they contribute to the theoretical debates by offering four more causal mechanisms shaping third mission activities: state withdrawal, status competition, new public management and organisational legitimacy being at risk. The interplay and intensity of these causal mechanisms then determine the extent to which universities shift in a hypothetical spectrum of global excellence on the one hand and regional relevance on the other. It is important to note that neither is static; on the contrary, they are open to negotiations and continuous reproduction over time. Furthermore, universities can display characteristic organisational behaviours of both, albeit to a varying degree. Thus, a university facing external pressures from both spheres should hire different members that would ideally help deliver demands emerging from either of them.

Lastly, recent literature indicates that the nature of innovation is changing and the varieties of innovation are growing (Edwards-Schachter, 2018). While providing empirical evidence to the argument that the understanding of innovation is changing, this thesis further contributes to the debates within innovation studies by marking tensions between different conceptualisations and shedding light on the way this tension permeates universities.

6.2 Generalisation of results and limitations

Departing from a critical realist perspective allows for the generalisability of results to some extent. As the contextual forces and mechanisms are profoundly important in shaping individual and organisational behaviour

within this philosophical stance, the results can be transferrable in part to other geographies, political systems and jurisdictions that include similar mechanisms and forces currently at play. Along these lines, I argue that it is highly likely that similar organisational dynamics could be observed in universities located in peripheral/less-developed regions of other European Union member states, particularly those that joined during and before the fourth enlargement in 1995. The reason for this is that the Netherlands and Portugal have over 63 and 35 years of history in the European Union, respectively, both periods long enough to be considerably affected by the union's political economy.

In a similar vein, this thesis also has the limitation of being an overly Eurocentric study. As such, the mechanisms and contextual factors triggering certain events might not be observed in other geographies, political systems and jurisdictions. In fact, even if similar underlying causal mechanisms are identified outside the EU, they may still not lead to exactly the same organisational responses. In such a circumstance, however, it is important to explore other factors at play and remember that the triggered mechanisms may lead to certain outcomes at a later stage when other contextual factors provide a conducive conjuncture and facilitate their lead to certain outcomes.

Moreover, the focus of this thesis was on the way institutions impact universities, with particular attention to higher education and, to some extent, regional policy. As such, insights into the role played by these institutions in other policy domains (e.g., research, innovation, etc.) are rather limited. Likewise, findings regarding how universities shape continuous reconstruction of these institutions, such as the state, the market and the professions and how this in turn affects transformation into an engaged university are finite.

6.3 Recommendations for future research

In addition to providing some new insights into the role of universities in innovation and regional development, this thesis also paves the way for some research avenues. First, the empirical part of this study illuminates the

institutional change trajectory of technical or technical-oriented universities located in peripheral regions. Future research should explore how comprehensive universities located in both less-developed and core regions deal with external pressures of transforming to an engaged university. Second, as mentioned earlier, the empirical context of this study is European. There is a need for broader perspectives to enrich our understanding of the role universities can assume in contributing to innovation-led regional development. Future studies, therefore, should entail empirical insights from other parts of the world, particularly the Global South. Third, this thesis presents an institutional change trajectory through the lens of universities. Scholars should also explore how formal and informal institutions within peripheral regions evolve and how their evolution affects this institutional change process. Lastly, it is clear that tensions between different conceptualisations of innovation are not trivial and the concept of innovation has become fragmented over decades. Future research should thus be concerned with this fragmentation and attempt to provide insight into how different understandings can be accommodated by the same innovation concept that will be operational across units, sectors, place and policy domains.

6.4 Implications for responsible innovation, policy and universities

There is an inherent assumption within responsible innovation discussions that universities, as publicly funded organisations, can and will facilitate such processes and ensure a variety of regional actors for the collective benefit of potential innovations. While higher education institutions possess the capacity and attributes to play a key role in regional responsible innovations, the findings demonstrate that such a "taken-for-granted assumption" largely based on their public status is far from reality. In fact, universities have accumulated more experience with industrial partners compared to other local actors over the past decades. As a result, the interests of businesses are better represented within their governance. This is exemplified by the presidency system and by the president being the head of the executive board in UT and five external members in the general council of UA usually coming

from the industry. However, responsible innovation processes seek out the societal benefits of innovation for broader civil society and not just industry. I therefore argue that it is time to consider the representation of non-industrial regional/local actors (municipalities, non-governmental organisations, other civil society associations) within university senates/councils/executive boards. Since transforming into an engaged university does not mean completely abandoning the entrepreneurial model, the opening up of university governance to other societal partners does not have to be realised at the expense of industry.

Responsibility also seems to be a slightly contested concept open to multiple interpretations. Earlier, I raised the question of whether innovations and universities should be globally, nationally or regionally responsible. The findings indicate that when global forces increase their pressure, universities turn to globally responsible innovations in their third mission activities. However, when regional influences prevail, the third mission adopts a regional character and universities embrace regionally responsible innovations. It is evident that universities shift over this fluid understanding of responsibility. Recently, Fitjar, Benneworth and Asheim (2020) argued that synergies need to be built between responsible innovation and smart specialisation strategies (RIS3), which can be achieved through the former adopting a place-based perspective and the latter embracing innovations that are responsible. The findings of this thesis clearly support the argument that if universities are expected to spur responsible innovations that are transformative in the geographical vicinities they are located in, then policy measures should focus on regionally responsible innovations and responsible smart specialisation innovation strategies, thereby benefiting from both approaches. Likewise, the territorial perspective needs to be embedded into Schot and Steinmueller's (2018) framing three of innovation and transformative change if it is to be mobilised as a policy tool.

Currently, one of the biggest challenges of universities is to simultaneously be both world-class and regionally relevant. The key to continuing as a world-class university is excellent research and publications, which result in better

performance in league tables. While not all higher education institutions feel the pressure of being regionally relevant equally (e.g., more for universities located in less-developed regions), the expectation to be world-class and acquire a better position in rankings is quite similar and high for each research-intensive university. The competition is both national and international. As such, I argue that a separate funding scheme designed specifically for universities located in less-developed regions of each country is necessary at both the national and European levels. Such an incentive can strengthen universities that were established with a clear regional mandate in this fierce competition: they will not have to sacrifice regional contribution for global excellence. Although the structural funds of the Cohesion Policy are geared towards such regions, their impact is limited because: a) many regional actors—not only universities—are eligible for these funds, which leads to a smaller share for each eligible entity and b) they do not necessarily go to the universities that need them most in peripheries that host more than one university c) peripheral regions in advanced countries are usually not eligible for the big chunk of this fund allocated for less-developed areas.

Moreover, as finding a balance between global excellence and regional relevance is going to be a concern for the foreseeable future, universities should provide flexibility to employees in what percentage of their work time they prefer to devote to meeting the demands of each and setting the timeframe during which they aim to achieve it. To illustrate this, an academic staff member who is good at both producing world-class research and regional engagement may prefer to devote their work time as follows: 30% on research, 20% on teaching, 30% on industry collaboration and other types of regional engagement activities and 20% on administrative duties during the next three academic years. Universities should re-organise themselves to be able to accommodate and enable such individual work planning.

6.5 Concluding remarks

This thesis portrays the journey of two universities aiming to transform from the entrepreneurial to the engaged model. I have shown that such an institutional change process is more complex than expected and far from

completed. I further reveal the idiosyncrasies of the universities' institutional environment—more demands and fewer resources available—and point out that they need financial, political and social support more than ever. Nevertheless, higher education institutions should not be expected to deliver miracles in a heroic manner. I therefore conclude by contending that a university can be considered necessary for innovation-led regional development but hardly sufficient and that its true impact can only be realised when it is further supported by regional and local actors as well as formal and informal institutions.

References

Aarstad, J., Kvitastein, O. A., & Jakobsen, S. E. (2016). Related and unrelated variety as regional drivers of enterprise productivity and innovation: A multilevel study. *Research Policy, 45*(4), 844-856.

Acemoglu, D., & Johnson, S. (2005). Unbundling institutions. *Journal of Political Economy, 113*(5), 949-995.

Alderman, N. (1998). Innovation performance in the periphery: The case of mechanical and electrical engineering. *Scottish Geographical Magazine, 114*(2), 94-102.

Alpaydin, U. A. R. (2021). *University-industry collaborations (UICs): A matter of proximity dimensions* (Publication No: 576). Doctoral dissertation, University of Stavanger.

Amin, A. (2001). Moving on: institutionalism in economic geography. *Environment and Planning A: Economy and Space, 33*, 1237-1241.

Arbo, P., & Benneworth, P. (2007). Understanding the regional contributions of higher education institutions. A literature review. *OECD Directorate for Education*, *9*(1), doi: 10.1787/161208155312.

Armstrong, H., & Taylor, J. (2000). *Regional economics and policy*. Blackwell.

Asheim, B., & Coenen, L. (2005). Knowledge bases and regional innovation systems: Comparing Nordic clusters. *Research Policy, 34*(8), 1173-1190.

Asheim, B. (2020). Economic geography as regional contexts' reconsidered - implications for disciplinary division of labour, research focus and societal relevance. *Norwegian Journal of Geography, 74*(1), 25-34.

Atta-Owusu, K. (2019). Oasis in the desert? Bridging academics' collaboration activities as a conduit for global knowledge flows to peripheral regions. *Regional Studies Regional Science, 6*(1), 265-280.

Audretsch, D. B. (2014). From the entrepreneurial university to the university for the entrepreneurial society. *The Journal of Technology Transfer, 39,* 313-321.

Bayuo, B. B., Chaminade, C., & Göransson, B. (2020). Unpacking the role of universities in the emergence, development and impact of social innovations - A systematic review of literature. *Technological Forecasting and Social Change, 155*.

Beer, A., Haughton, G., & Maude, A. (2003). *Developing locally: An international comparison of local and regional economic development*. Policy Press.

Bekkelund, N. G. (2021). Change agency and reproductive agency in the course of industrial path evolution. *Regional Studies, 55*(4), 757-768.

Benneworth, P., Coenen, L., Moodysson, J., & Asheim, B. (2009). Exploring the multiple roles of Lund University in strengthening Scania's regional innovation system: Towards institutional learning? *European Planning Studies, 17(*11), 1645-1664.

Benneworth, P., & Pinheiro, R. (2017). Involving universities in regional upgrading in the periphery: Lessons from Northern Europe. In M. Fonseca & U. Fratesi (Eds.), *Regional upgrading in Southern Europe* (pp. 299-321). Springer.

Bhaskar, R., & Lawson, T. (1998). Introduction: Basic texts and developments. In M. S. Archer, R. Bhaskar, A. Collier, T. Lawson & A. Norrie (Eds.), *Critical realism: Essential readings (*pp. 3-15). Routledge.

Bhaskar, R. (1975). *A realist theory of science*. Leeds Books.

Bienkowska, D., & Klofsten, M. (2012). Creating entrepreneurial networks: academic entrepreneurship, mobility, and collaboration during PhD education. *Higher Education, 64*, 207-222.

Boschma, R., & Frenken, K. (2006). Why is economic geography not an evolutionary science? Towards an evolutionary economic geography. *Journal of Economic Geography, 6*(3), 273-302.

Bramwell, A., & Wolfe, D. A. (2008). Universities and regional economic development: The entrepreneurial University of Waterloo. *Research Policy, 37*(8), 1175-1187.

Breznitz, S. M., & Feldman, M. P. (2012). The engaged university. *The Journal of Technology Transfer, 37,* 139-157.

Bridger, J. C., & Alter, T. R. (2006). The engaged university, community development and public scholarship. *Journal of Higher Education Outreach and Engagement, 11*(1), 163-178.

Bryman, A. (2016). *Social research methods*. Oxford University Press.

Capano, G. (2018). Policy design spaces in reforming governance in higher education: the dynamics in Italy and the Netherlands. *Higher Education, 75*, 675-694.

Cappocia, G. (2016). Critical junctures. In O. Fioretos, T. G. Falleti & A. Sheingate (Eds.), *The Oxford handbook of historical institutionalism* (pp. 89-106). Oxford University Press.

Carvalho, T., & Bruckmann, S. (2014). Reforming Portuguese public sector: A route from health to higher education. In C. Musselin & P. Teixeira (Eds.), *Reforming higher education* (pp. 83-102). Springer.

Carvalho, T., & Videira, P. (2019). Losing autonomy? Restructuring higher education institution governance and relations between teaching and non-teaching staff. *Studies in Higher Education, 44*(4), 762-773.

Charles, D. (2016). The rural university campus and support for rural innovation. *Science and Public Policy, 43*(6), 763-773.

Chatterton, P., & Goddard, J. (2000). The response of higher education institutions to regional needs. *European Journal of Education, 35*(4), 475-496.

Chesbrough, H. W. (2003). *Open innovation: The new imperative for creating and profiting from technology*. Harvard Business Press.

Christmann, G. B. (2014). Social entrepreneurs on the periphery: Uncovering emerging pioneers of regional development. *disP-The Planning Review, 50*(1), 43-55.

Cilliers, P. (2005). Complexity, deconstruction and relativism. *Theory, Culture and Society, 22*(5), 255-267.

Clark, B. R. (2004). Delineating the character of the entrepreneurial university. *Higher Education Policy, 17,* 355-370.

Coenen, L., Davidson, K., Frantzeskaki, N., Grenfell, M., Hakansson, I., & Hartigan, M. (2020). Metropolitan governance in action? Learning from metropolitan Melbourne's urban forest strategy. *Australian Planner, 56*(2), 144-148.

Coenen, L. (2007). The role of universities in the regional innovation systems of the North East of England and Scania, Sweden: providing missing links? *Environment and Planning C: Government and Policy, 25*(6), 803-821.

Cohen, W. M., Nelson, R. R., & Walsh, J. P. (2002). Links and impacts: The influence of public research in industrial R&D, *Management Science, 48*(1), 1-23.

Compagnucci, L., & Spigarelli, F. (2020). The third mission of the university: A systematic literature review on potentials and constraints. *Technological Forecasting and Social Change, 161*.

Cooke, P., & Morgan, K. (1998). *The associational economy*. Oxford University Press.

Cooke, P. (2001). Regional innovation systems, clusters and the knowledge economy. *Industrial and Corporate Change, 10*(4), 945-974.

Cooper, D. (2011). *The university in development: Case studies of use-oriented research*. HSRC Press.

Creswell, J. W., Hanson, W. E., Plano, V. L. C., & Morales, A. (2007). Qualitative research design: Selection and implementation. *The Counseling Psychologist, 35*(2), 236-264.

Davies, S., Michie, R., & Vironen, H. (2012). Can peripheral regions innovate? In M. Danson & P. de Souza (Eds.), *Regional development in Northern Europe: Peripherality, marginality and border issues* (pp. 118-133). Routledge.

De Boer, H., Enders, J., & Leisyte, L. (2007). Public sector reform in Dutch higher education: The organizational transformation of the university. *Public Administration, 85*(1), 27-46.

D'Este, P., & Patel, P. (2007). University-industry linkages in the UK: What are the factors underlying the variety of interactions with industry? *Research Policy, 36(*9), 1295-1313.

D'Este, P., & Perkmann, M. (2011). Why do academics engage with industry? The entrepreneurial universities and individual motivations. *The Journal of Technology Transfer, 36*, 316-339.

Diario de Republica (2007). Regimo Juridico das Institutiçoes de Ensino Superior. [Legal Regime of Higher Education Institutions]. https://dre.pt/application/conteudo/640339

DiMaggio, P. J. & Powell, W. W. (1991). Introduction. In P. J. DiMaggio & W. W. Powell (Eds.), *The new institutionalism in organizational analysis* (pp. 1-40). University of Chicago Press.

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review, 48*(2), 147-160.

Donina, D., & Hasanefendic, S. (2019). Higher education institutional governance reforms in the Netherlands, Portugal and Italy: A policy translation perspective addressing the homogenous/heterogeneous dilemma. *Higher Education Quarterly, 73*(1), 29-44.

Dosi, G., & Nelson, R. R. (2010). Technical change and industrial dynamics as evolutionary processes. In B. H. Hall & N. Rosenberg (Eds.), *Handbook of the economics of innovation* (pp. 51-127). Elsevier.

Dubois, A. (2015). Business networks and the competitiveness of small manufacturing firms in Sweden's northern periphery. *Norwegian Journal of Geography, 69*(3), 135-151.

Dutch Parliament (2016). *Rapport: Kosten en opbrengsten van saldoverbeterende maatregelen 2011-2016; Zicht op zes jaar bezuinigen en lasten verzwaren. [Report: Cost and revenues of balance-improving measures 2011-2016; Outlook on six years of cutbacks and heavier burdens].* https://www.tweedekamer.nl/kamerstukken/detail?id=2016D36897&did=2016D36897

Eder, J. (2019). Innovation in the periphery: A critical survey and research agenda. *International Regional Science Review, 42*(2), 119-146.

Edwards-Schachter, M. (2018). The nature and variety of innovation. *International Journal of Innovation Studies, 2*(2), 65-79.

Elder-Vass, D. (2010). *The causal power of social structures: Emergence, structure and agency*. Cambridge University Press.

Enders, J., & de Boer, H. (2009). The mission impossible of the European university: Institutional confusion and institutional diversity. In A. Amaral, G. Neave, C. Musselin & P. Maassen (Eds.), *European integration and the governance of higher education and research* (pp. 159-178). Springer.

Evers, G. (2019). The impact of the establishment of a university in a peripheral region on the local labor market for graduates. *Regional Studies, Regional Science, 6*(1), 319-330.

Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university-industry-government relations. *Research Policy, 29*(2), 109-123.

Etzkowitz, H., & Webster, A. (1998). Entrepreneurial science: The second academic revolution. In E. Etzkowitz, A. Webster & P. Healey (Eds.), Capitalizing knowledge: New intersections of industry and academia (pp. 21-46). SUNY Press.

Etzkowitz, H. (2013). Anatomy of the entrepreneurial university. *Social Science Information, 52*(3), 486-511.

Etzkowitz, H. (2001). The second academic revolution and the rise of the entrepreneurial science. *IEEE Technology and Society Magazine, 20*(2), 18-29.

Fitjar, R. D., & Rodriguez-Pose, A. (2011). Innovating in the periphery: Firms, values and innovation in the Southwest Norway. *European Planning Studies, 19*(4), 555-574.

Fitjar, R., Benneworth, P., & Asheim, B. (2019). Towards regional responsible research and innovation? Integrating RRI and RIS in European innovation policy. *Science and Public Policy, 46*(5), 772-783.

Fleetwood, S. (2001). Causal laws, functional relations and tendencies. *Review of Political Economy, 13*(2), 201-220.

Florida, R., Mellander, C., & Stolarick, K. (2008). Inside the black box of regional development: Human capital, the creative class and tolerance. *Journal of Economic Geography, 8*(5), 615-649.

Fonseca, L., Cinar, R., da Pires, A. R., & Rodrigues, C. (2021). Evolutionary analysis of a university's engagement in a less-developed region: The case of the

University of Aveiro. In D. Charles, R. Ahoba-Sam & S. A. M. Garzon (Eds). *Entrepreneurial universities in regional innovation* (pp. 131-151). Ashgate Publishing. (in press).

Fonseca, L. (2019). Designing regional development? Exploring the University of Aveiro's role in the innovation policy process. *Regional Studies, Regional Science, 6*(1), 186-202.

Foray, D. (2009). Understanding smart specialization. In D. Pontikakis, D. Kyriakou & R. Van Bavel (Eds.), *The question of R&D specialization: Perspectives and policy implications*. European Commission.

Freeman, C. (1991). Networks of innovators: A synthesis of research issues. *Research Policy, 20*(5), 499-514.

Frenkel, A., & Leck, A. (2017). Spatial aspects of education-job matching in Israel. *Regional Studies, 51*(7), 1063-1076.

Friedland, R., & Alford, R. R. (1991). Bringing society back in: Symbols, practices and institutional contradictions. In W. W. Powell & P. J. DiMaggio (Eds.), *The new institutionalism in organizational analysis* (pp. 232-267), University of Chicago Press.

Fuenfscilling, L., & Truffer, B. (2014). The structuration of socio-technical regimes-Conceptual foundations from institutional theory. *Research Policy, 43*(4), 772-791.

Geddes, M., & Newman, I. (1999). Evolution and conflict in local economic development. *Local Economy, 13*, 12-25.

Geiger, R. L., & Sa, C. (2008). *Tapping the riches of science: Universities and the promise of economic growth*. Harvard University Press.

Gertler, M. S. (2010). Rules of the game: The place of institutions in regional economic change. *Regional Studies, 44*(1), 1-15.

Gertler, M. S. (2004). *Manufacturing culture: The institutional geography of industrial practice*. Oxford University Press.

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational Research Methods, 16(*1), 15-31.

Goddard, J., Hazelkorn, E., Kempton, L., & Vallance, P. (2016). *The civic university: Policy and leadership challenges*. Edward Elgar.

Goedegebuure, L. C. J., Kaiser, F., Maassen, P., & de Weert, E. (1994). International perspectives on trends and issues in higher education policy. In L. C. J. Goedegebuure, F. Kaiser, P. Maassen, L. Meek, F. Van Vught & E. de Weerts

(Eds.), *Higher education policy. An international perspective* (pp. 315-348). Pergamon Press.

Gong, H., & Hassink, R. (2020). Context sensitivity and economic-geographic re-theorizing. *Cambridge Journal of Regions, Economy and Society, 13*(3), 475-490.

Greenwood, R., Raynard, M., Kodeih, F., Micelotta, E. R., & Lounsbury, M. (2011). Institutional complexity and organizational responses. *The Academy of Management Annals, 5*(1), 317-371.

Guerrero, M., & Urbano, D. (2012). The development of an entrepreneurial university. *The Journal of Technology Transfer, 37*, 43-74.

Guerrero, M., Herrera, F., & Urbano D. (2019). Strategic knowledge management within subsidized entrepreneurial university-industry partnerships. *Management Decision, 57*(12), 3280-3300.

Gunasekara, C. (2006). Reframing the role of universities in the development of regional innovation systems. *The Journal of Technology Transfer, 31*, 101-113.

Hardy, C., & Maguire, S. (2008). Institutional entrepreneurship. In R. Greenwood, C. Oliver, K. Sahlin & R. Suddaby (Eds.), *The Sage handbook of organizational institutionalism* (pp. 198-219). Sage.

Harrison, J., & Turok, I. (2017). Universities, knowledge and regional development. *Regional Studies, 51*(7), 977-981.

Hogan, J. (2006). Remoulding the critical juncture approach. *Canadian Journal of Political Science/ Revue Canadienne de Science Politique, 39*(3), 657-679.

Hood, C. (1991). A public management for all seasons. *Public Administration, 69*(1), 3-19.

Horta, H. (2010). The role of the state in internationalization of universities in catching-up countries: An analysis of the Portuguese higher education system. *Higher Education Policy, 23,* 63-81.

Isaksen, A., & Karlsen, J. (2016). Innovation in peripheral regions. In R. Shearmur, C. Carrincazeaux & D. Doloreux (Eds.), *Handbook of the geographies of innovation* (pp. 277-285). Edward Elgar.

Isaksen, A., & Trippl, M. (2017). Exogenously led and policy-supported new path development in peripheral regions: analytical and synthetic routes. *Economic Geography, 93*(5), 436-457.

Jasanoff, S., Markle, G., Petersen, J., & Pinch, T. (1994). *Handbook of science and technology studies*. Sage.

Jakobsen, S. E., Floysand, A., & Aarstad, J. (2020). "På den grønne eng – hvilke bedrifter introduserer grønne innovasjoner?" In L. Longvanes & T. Årethun (Eds.), *Bærekraftig verdiskaping* (pp. 41-56). Fagbokforlaget.

Jakobsen, S. E., Floysand, A., & Overton, J. (2019). Expanding the field of Responsible Research and Innovation (RRI) – from responsible research to responsible innovation. *European Planning Studies, 27*(12), 2329-2343.

Karsten, S. (1999). Neoliberal education reform in the Netherlands. *Comparative Education, 35*(3), 303-317.

Kempton, L. (2015). Delivering smart specialization in peripheral regions: the role of universities. *Regional Studies, Regional Science, 2*(1), 489-496.

Kickert, W. J. M. (1997). Public governance in the Netherlands: An alternative to Anglo-American managerialism. *Public Administration, 75*(4), 731-752.

Kickert, W. (1995). Steering at a distance: A new paradigm of public governance in Dutch higher education. *Governance, 8*(1), 135-157.

Kitagawa, F., Marzocci, C., Sanchez-Barrioluengo, M., Uyarra, E. (2021). Anchoring talent to regions: the role of universities in graduate retention through employment and entrepreneurship. *Regional Studies*, epub ahead of print.

Kitagawa, F. (2005). Entrepreneurial universities and the development of regional societies: a spatial view of the Europe of knowledge. *Higher Education Management and Policy, 17*(3), 65-89.

Kline, S. J., & Rosenberg, N. (1986). An overview of innovation. In R. Landau & N. Rosenberg (Eds.), *The positive sum strategy: Harnessing technology for economic growth* (pp. 275-304). National Academy Press.

Kosmutzky, A., & Nokkala, T. (2020). Towards a methodology discourse in comparative higher education. *Higher Education Quarterly, 74*(2), 117-123.

Laredo, P. (2007). Revisiting the third mission of universities: Toward a renewed categorization of university activities? *Higher Education Policy, 20*(4), 441-456.

Lawson, T. (1997). *Economics and reality*. Routledge.

Lazzeretti, L., & Tavoletti, E. (2005). Higher education excellence and local economic development: The case of the entrepreneurial University of Twente. *European Planning Studies, 13*(3), 475-493.

Lundvall, B. A. (2002). *National systems of innovation: Towards a theory of innovation and interactive learning*. Pinter Publishers.

Mahoney, J. (2000). Path dependence in historical sociology. *Theory and Society, 29*(4), 507-548.

Marinova, D., & Philimore, J. (2003). Models of innovation. In L. V. Shavinina (Ed.), *International handbook on innovation* (pp. 44-53). Elsevier.

Martin, R., & Sunley, P. (2006). Path dependence and regional economic evolution. *Journal of Economic Geography*, *6*(4), 395-437.

Martin, R. (2000). Institutional approaches in economic geography. In E. Sheppard & T. J. Barnes (Eds.), *A companion to economic geography* (pp. 77-94). Blackwell Publishing.

Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology, 83*(2), 340-363.

Moghadam-Saman, S. (2019). *How do mechanisms' 'tendency' within critical realism influence our understanding of structure-agency relations?* Runin Project. https://runinproject.eu/results/working-paper-series/

Morgan, K., & Neuwalers, C. (1999). *Regional innovation startegies: The challenge for less-favoured regions*. Routledge.

Morgan, K. (2004). Sustainable regions: governance, innovation and scale. *European Planning Studies, 12*(6), 871-889.

Moulaert, F., & Mehmood, A. (2010). Analysing regional development and policy: A structural-realist approach. *Regional Studies, 44*(1), 103-118.

Mowery, D. C., Nelson, R. R., Sampat, B. N., & Ziedonis, A. A. (2001). The growth of patenting and licensing by U.S. universities: An assessment of the effects of the Bayh-Dole act of 1980. *Research Policy, 30*(1), 99-119.

Nieth, L., & Benneworth, P. (2020). Challenges of knowledge combination in strategic regional innovation processes-the Creative Science Park in Aveiro. *European Planning Studies, 28*(10), 1922-1940.

Nieth, L. (2019). Understanding strategic 'black hole' in regional innovation coalitions. Reflections from the Twente region, eastern Netherlands. *Regional Studies, Regional Science, 6*(1), 203-216.

Organisation for Economic Cooperation and Development (2018). *Oslo manual. Guidelines for collecting, reporting and using data on innovation*. OECD.

Organisation for Economic Cooperation and Development (1999). *Boosting innovation: The cluster approach*. OECD.

Owen, R., Macnaghten, P., & Stilgoe, J. (2012). Responsible research and innovation: From science in society to science for society, with society. *Science and Public Policy, 39*(6), 751-760.

Perkmann, M., Tartari, V., McKelvey, M., Autio, E., Brostrom, A., D'Este, P., Fini, R., Geuna, A., Grimaldi, R., Hughes, A., Krabel, S., Kitson, M., Llerena, P., Lissoni, F., Salter, A., & Sobrero, M. (2013). Academic engagement and

commercialization: A review of the literature on university-industry relations. *Research Policy, 42*(2), 423-442.

Petrov, A. (2011). Beyond spillovers: Interrogating innovation and creativity in the peripheries. In H. Bathelt, M. P. Feldman & D. Kogler (Eds.), *Beyond territory: Dynamic geographies of knowledge creation, diffusion and innovation* (pp. 149-167). Routledge.

Pike, A., Rodriguez-Pose, A., & Tomaney, J. (2007). What kind of local and regional development and for whom? *Regional Studies, 41*(9), 1253-1269.

Pinheiro, R., Langa, P. V., & Pausits, A. (2015). One and two equals three? The third mission of higher education institutions. *European Journal of Higher Education, 5*(3), 233-249.

Pinheiro, R., & Stensaker, B. (2014). Designing the entrepreneurial university: The interpretation of a global idea. *Public Organization Review, 14*, 497-516.

Pinto, H., Fernandez-Esquinas, M., & Uyarra, E. (2015). Universities and knowledge-intensive business services (KIBS) as sources of knowledge for innovative firms in peripheral regions. *Regional Studies, 49*(11), 1873-1891.

Pollitt, C., & Bouckaert, G. (2000). *Public management reform. A comparative analysis*. Oxford University Press.

Powell, W. W., & Bromley, P. (2015). New institutionalism in the analysis of complex organizations. In J. D. Wright (Ed.), *International encyclopedia of the social and behavioral sciences*. Elsevier.

Reay, T., & Hinings, C. R. (2009). Managing the rivalry of competing institutional logics. *Organization Studies, 30*(6), 629-652.

Richter, R. (2019). Rural social enterprises as embedded intermediaries: The innovative power of connecting rural communities with supra-regional networks. *Journal of Rural Studies, 70*, 179-187.

Rodrigues, C., & Teles, F. (2017). The fourth helix in smart specialization strategies: The gap between discourse and practice. In S. Monteiro & G. Carayannis (Eds.), *The quadruple innovation helix nexus* (pp. 205-226). Palgrave Macmillian.

Rodriguez-Pose, A. (2020). Institutions and the fortune of territories. *Regional Science, Policy and Practice, 12*(3), 371-386.

Rodriguez-Pose, A. (2013). Do institutions matter for regional development? *Regional Studies, 47*(7), 1034-1047.

Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions rule: The primacy of institutions over geography and integration in economic development. *Journal of Economic Growth, 9*(2), 131-165.

Rothwell, R., & Zegveld, W. (1985). *Reindustrialization and technology*. Longman Group.

Rothwell, R. (1994). Towards the fifth-generation innovation process. *International Marketing Review, 11*(1), 7-31.

Ruegg, W. (2004). *Universities in the nineteenth and early twentieth centuries (1800-1945)*. Cambridge University Press.

Sanchez-Barrioulengo, M., & Benneworth, P. (2019). Is the enterprenuerial university also regionally engaged? Analysing the influence of university's structural configuration on third mission performance. *Technological Forecasting and Social Change, 141*, 206-218.

Santiago, R., Carvalho, T., Amaral, A., & Meek, V. L. (2006). Changing patterns in the middle management of higher education institutions: The case of Portugal. *Higher Education, 52*(2), 215-250.

Sayer, A. (1981). Abstraction: A realist interpretation. *Radical Philosophy, 28*, 6-15.

Schot, J., & Steinmueller, W. E. (2018). Three frames for innovation policy: R&D, systems of innovation and transformative change. *Research Policy, 47*(9), 1554-1567.

Scott, W. R. (2008). *Institutions and organizations. Ideas, interests and identities*. Sage.

Scott, A., Steyn, G., Geuna, A., Brusoni, S., & Steinmuller, E. W. (2002). *The economic returns to basic research and the benefits of university-industry relationships: A literature review and update of findings*. Report for the Office of Science and Technology. SPRU, University of Sussex.

Scott, W. R. (1987). The adolescence of institutional theory. *Administrative Science Quarterly, 32*(4), 493-511.

Selznick, P. (1957). *Leadership in administration*. Harper & Row.

Shearmur, R. (2012). Are cities the font of innovation? A critical review of the literature on cities and innovation. *Cities, 29*(2), 9-18.

Shearmur, R. (2015). Far from the madding crowd: Slow innovators, information value and the geography of innovation. *Growth and Change, 46*(3), 424-442.

Sotarauta, M. (2018). Smart specialization and place leadership: dreaming about shared visions, falling into policy traps? *Regional Studies, Regional Science, 5*(1), 190-203.

Stake, R. E. (2006). *Multiple case study analysis*. The Guilford Press.

Stilgoe, J., Owen, R., & Macnaghten, P. (2013). Developing a framework for responsible innovation. *Research Policy, 42*(9), 1568-1580.

Storper, M. (1999). The resurgence of regional economies: ten years later. In T. J. Barnes & M. S. Gertler (Eds.), *The new industrial geography: Regions, regulation and institutions* (pp. 23-53). Routledge.

Suchman, M. C. (1995). Managing legitimacy: strategic and institutional approaches. *Academy of Management Review, 20*(3), 571-610.

Teichler, U., Arimoto, A., & Cummings, W. K. (2013). *The changing academic profession. Major findings of a comparative survey*. Springer.

Teixeira, P. N., Rocha, V., Biscaia, R., & Cardoso, M. F. (2012). Competition and diversity in higher education: an empirical approach to specialization patterns of Portuguese institutions. *Higher Education, 63,* 337-352.

Teles, N. (2015). *Financialisation and neoliberalism: The case of water provision in Portugal.* Working Paper Series. FESSUD, University of Coimbra. https://estudogeral.uc.pt/bitstream/10316/40969/1/Financialisation%20and%20neoliberalism%20the%20case%20of%20water%20provision%20in%20Portugal.pdf

Thelen, K. (1999). Historical institutionalism in comparative politics. *Annual Review of Political Science, 2,* 369-404.

Thomas, E., & Pugh, R. (2020). From 'entrepreneurial' to 'engaged' universities: social innovation for regional development in the Global South. *Regional Studies, 54*(12), 1631-1643.

Thornton, P. H., Ocasio, W., & Lounsbury, M. (2012). *The institutional logics perspective. A new approach to culture, structure and process.* Oxford University Press.

Thornton, P. H., & Ocasio, W. (2008). Institutional logics. In R. Greenwood, C. Oliver, K. Sahlin & R. Suddaby (Eds.), *The Sage handbook of organizational institutionalism* (pp. 99-129). Sage.

Thornton, P. H., & Ocasio, W. (1999). Institutional logics and the historical contingency of power in organizations: Executive succession in the higher education publishing industry, 1958-1990. *American Journal of Sociology, 105*(3), 801-843.

Thornton, P. H. (2004). *Markets from culture: Institutional logics and organizational decision in higher education publishing*. Stanford University Press.

Tolbert, P. S., & Zucker, L. G. (1999). The institutionalization of institutional theory. In S. Clegg & C. Hardy (Eds.), *Studying organizational theory and method* (169-184). Sage.

Torre, A., & Rallet, A. (2005). Proximity and localization. *Regional Studies, 39*(1), 47-59.

Uyarra, E. (2010). Conceptualizing the regional roles of universities, implications and contradictions. *European Planning Studies, 18*(8), 1227-1246.

Virkkala, S. (2007). Innovation and networking in peripheral areas - A case study of emergence and change in rural manufacturing. *European Planning Studies, 15*(4), 511-529.

Von Schomberg, R. (2013). A vision of responsible innovation. In R. Owen, M. Heintz & J. Bessant (Eds.), *Responsible innovation* (pp. 51-74). Wiley.

Von Schomberg, R. (2011). *Towards responsible research and innovation in the information and communication technologies and security technology fields*. European Commission.

Watson, D., Hollister, R. M., Stroud, S. E., & Babcock, E. (2011). *The engaged university: International perspectives on civic engagement*. Routledge.

Weerts, D. J. (2014). State funding and the engaged university: Understanding community engagement and state appropriations in higher education. *The Review of Higher Education, 38*(1), 133-169.

Wetgevingsnotitie (2005). *Naar een nieuwe Wet op het hoger onderwijs en onderzoek. [Towards a new higher education and research act].* Ministry of Science and Education. The Hague, The Netherlands.

World Bank (2009). *World development report 2009: Reshaping economic geography*. World Bank.

Yin, R. K. (2003). *Case study research. Design and methods*. Sage.

Youtie, J., & Shapira, P. (2008). Building an innovation hub: A case study of the transformation of university roles in regional technological and economic development. *Research Policy, 37*(8), 1188-1204.

Zwart, H., Landeweerd, L., & van Rooji, A. (2014). Adapt or perish? Assessing the recent shift in the European research funding arena from 'ELSA' to 'RRI'. *Life Sciences, Society and Policy, 10*(11).

Zukauskaite, E., Trippl, M., & Plechero, M. (2017). Institutional thickness revisited. *Economic Geography, 93*(4), 325-345.

APPENDIX A

Model	Knowledge "factory"	Relational university	Entrepreneurial University	Systemic University	Engaged University
Main role of universities	Production of scientific knowledge	Exchange of knowledge	Active commercialisation role	Boundary spanning role	Developmental role
Main unit of analysis	Innovation outputs	Linkages	Intermediaries (e.g., TTOs)	Systems /networks	Spaces of governance
Main partners beneficiaries	High tech firms located in proximity to universities	Large manufacturing firms	Large manufacturing firms Spin-off firms	Regional clusters Regional SMEs	Regional stakeholders
Directionality of engagement	Unidirectional (implicit)	Bi-directional (implicit)	Bi-directional (explicit)	Triple helix (universities, industry and government)	Responsive
Dominant methodology	Industrial surveys	Industrial surveys	Surveys of university TT managers	National and regional innovation surveys Case studies	Case studies
Key factors influencing impact	Citation count Production function analysis Research intensity/inputs Geographical proximity	Structural factors (size of firm, age, sector and R&D intensity) Innovation strategy	Organisational structures/forms Managerial practices Faculty behaviour/incentives	Regional system configuration	Number and synergies between universities
Policy implications	Co-location of firms and universities Increased funding for research	Some links should be promoted vis-à-vis others	Intermediaries and organisational arrangements/ incentives are needed to ensure links	Regional policy Institutional capacity of universities Institutional arrangements are important to ensure linkages	University leadership. Joined up policies/ incentives Joining up of universities' missions and other policies at different levels

Source: Uyarra (2010, p. 1230)

PART II: ARTICLES

CHANGING CONCEPTUALIZATION OF INNOVATION IN THE EUROPEAN UNION AND ITS IMPACT ON UNIVERSITIES: CRITICAL JUNCTURES AND EVOLVING INSTITUTIONAL DEMANDS

Abstract

Ridvan Cinar[a,b], Paul Benneworth[a,c], Lars Coenen[a]

a: Mohn Center for Innovation and Regional Development, Western Norway University of Applied Sciences, Bergen, Norway

b: Department of Social, Political and Territorial Sciences, University of Aveiro, Aveiro, Portugal

c: Center for Higher Education Policy Studies, University of Twente, Enschede, the Netherlands

This paper addresses the antecedents of changing conceptualization of innovation in the European Union (EU) and their impact on institutional demands upon European universities. We consider this change to be triggered or accelerated by political, social, economic and/or technological developments taking place at the macro level, ultimately permeating the institutional field of innovation in the EU. We mobilize the theoretical concept of critical junctures, drawing on historical institutionalism, to explore significant periods that have affected understanding of innovation in the EU and institutional expectations from universities. Through an analysis of European policy corpus relating to innovation, we identify three distinct periods, 1983-1986, 1995-2000 and 2008-2012 that have considerably contributed into broadening the conceptualization of innovation and then demonstrate the way these periods shaped institutional expectations from universities. We argue that this broadening has resulted in growing tensions between different conceptualizations of innovation and these underlying tensions make it increasingly difficult for universities to meet all the demands simultaneously.

1. Introduction

Innovation is widely recognized to be an underpinning element of economic growth and the basis for constructing competitive advantage. This is acknowledged by a range of public policy-makers who have increasingly placed supporting innovation at the heart of national competitiveness strategy (Cantwell, 2004). The European Union (EU), in particular, has historically been active in its pursuit of spurring innovation across the member states (Borras, 2003) and universities have been placed at the centre of its innovation agenda since the 1980s (Arbo & Benneworth, 2007). As such, there have been several innovation-related institutional demands upon universities over the past four decades.

Innovation-related institutional demands, originating from the policy sphere, have multiplied and diversified. While throughout the 1980s and 1990s, the primary emphasis was on investing in science and technology driven innovation (Patel & Pavitt, 1987; Siegel, Veugelers & Wright, 2007), universities have recently been expected to go beyond this (Goddard, Hazelkorn & Vallance, 2016) and also contribute into other types such as social innovation (EC, 2018) and eco-innovation (EC, 2013). Increasing recognition of such emerging types, while the emphasis on science and technology driven innovation still persists, results in multi-layered institutional expectations. This enlarges the scope of innovation-related third mission activities universities are expected to engage. Enders and de Boer (2009, p. 160) characterize the situation as 'mission stretch' referring to the policymakers' constantly formulated new innovation-related demands, which can be contradictory with each other, without the fading emphasis on the old ones.

Meanwhile, what is expected from innovation itself has also evolved. A new role has been cast for innovation, particularly in the European Union: solving complex grand societal challenges (Mazzucato, 2018; Kuhlman & Rip, 2018). Innovation policies and strategies are now expected to go beyond fostering economic growth and assume other tasks such as tackling climate change and addressing challenges of ageing and food security (Coenen, Hansen, & Rekers, 2015). While it has been argued that there has been a significant change in our conceptualization of innovation, particularly in Europe (Edwards-Schachter, 2018), what influenced and accelerated this change, its specificities and how exactly it has shaped institutional demands upon universities

remains unexplored. To better understand the characteristics of changing conceptualization of innovation in the EU and the exact roles universities are expected to play within it, we should first explore the antecedents. In this paper, therefore, we seek to map out significant periods, entailing socioeconomic, political and/or technological developments that have influenced the conceptualization of innovation within the EU and then reflect on how this in turn have shaped innovation-related demands upon European universities.

As a first step, we lay out our theoretical framework with which we periodise conceptualization of innovation in the EU over the last four decades. In doing so, we use the concept of critical juncture, which draws upon historical institutionalism and allows a distinction of different periods within the life cycle of a field. We then further set out our methodology, a structured review and analysis of the European policy corpus relating to innovation. Following this, we map out three distinct periods entailing significant developments, 1983-1986, 1995-2000 and 2008-2012 that have considerably contributed into broadening the conceptualization of innovation and then demonstrate the way these periods shaped institutional expectations from universities. We conclude by contending that this broadening has resulted in growing tensions between different conceptualizations of innovation and these underlying tensions make it increasingly difficult for universities to meet all the demands simultaneously.

2. Insight from historical institutionalism: critical junctures

In this paper, we aim to identify the main periods during which changes in the understanding of innovation within the EU started to take place, thereby drawing temporal boundaries on the basis of which there has been greatest internal consistency and qualitative difference from other periods. To do this, we draw on the critical juncture concept that emerged in historical institutionalism, an approach of historical explanation that seeks to deal with the issues of the path dependency of institutional structures and the way field level actors' choices shape institutional development (Peters, 1999). The basis of historical institutionalism is that institutions functioning in a domain constitute a field, and the lifecycle of these fields is characterised by periods of "business-as-usual" (normal periods) and 'critical junctures' where significant changes in belief systems, shared meanings, and/or policies take place

(Gorges, 2001). Critical junctures are periods during which a choice is made among alternatives and institutional fields realign in respond to those choices (Mahoney, 2000). They may either be sudden, taking place over short periods of time, or more gradual involving accumulation of various developments (Mahoney, 2001).

Hogan (2006, p. 664) argues that critical junctures should fulfil two fundamental criteria; a) *'generative cleavage'* and b) *'significant, swift and encompassing change'*. Generative cleavage refers to the emergence of tensions that create the rationale for response leading to the critical juncture. This may be outside the field, such as a social crisis demanding an urgent political response, or it may emerge through a gradual accretion the consequences of a long-term internal secular shift. Scholars of historical institutionalism traditionally considered large-scale incidents such as revolutions, economic crisis, and coup d'état, generating cleavage in institutions and institutional fields (Cortell & Peterson, 1999), thereby triggering change. Likewise, steady secular shifts such as class differences and rural/urban divide can gradually increase and also lead to tipping points where quantitative changes have a qualitative effect on the way that society functions, thereby creating an urgency for response (Hogan, 2006).

There is no singular definition for a significant change in historical institutionalist approach. Nevertheless, one can still set some standards for it to portray the desired extent: there is a shift in institutional arrangements that changes the 'rules of the game' leading to qualitatively different outcomes. A new concept, paradigm or idea goes in a relatively short period of time from being a fringe novelty to being ubiquitous in the institutional field (Hogan, 2006). The institutions that change may be formal (such as government ministries, executive agencies), or they may be informal (such as belief sets or shared meanings). A substantive change may see substantive powerful new organisations emerging or even new kinds of formal institutions. It may also involve a shift in informal institutions, in terms of values, norms, shared meanings and ways of working (Hogan & Doyle, 2007). These shifts together constitute a qualitatively different environment in which hitherto improbable results are realised whilst more traditional outcomes gradually fade out.

As for the remaining elements of the second criteria, Hogan (2006) argues that "significant change must take place quickly" and the encompassing change "must

have an impact on all, or most of those who have an interest in the institutions or institutions it is impacting upon" (p. 666). Any claim for a critical juncture in an institutional field should therefore be able to point to these characteristics, namely new actors/dynamics, new outcomes, a wide range of impacted individuals/entities and rapid developments alongside the fading out of the other available alternative.

3. Methodology

This paper seeks to map out critical junctures in the institutional field of innovation within the EU, here defined to cover various strategies, input from multiple policy domains, and different approaches towards innovation, affected by external and internal conditions under which innovation takes place. We characterize innovation in the EU as a field in which various readings of "innovation" are used and aim to explore the antecedents of these various readings. Our analysis has two elements. The first is to identify distinct phases (critical junctures) within the evolution of this particular field, to gain insights into the kind of developments that has become increasingly accentuated in innovation debates. The second element is to scrutinize the impact of these distinct phases on the conceptualization of innovation and innovation-related demands upon universities.

In our analysis, we define the boundaries of critical junctures by examining and comparing the institutional patterns evident in the historical evolution of the field and distinguish them from the rest. We adopt here an inductive approach, gathering information from which to map institutional patterns across time and then analysing those patterns in terms of within- and between-period similarity to identify the critical junctures. We mapped the structure of innovation concept as articulated in policy documents, which we assume to reflect the underlying institutional domain. We identify critical junctures as points where there are substantial shifts in the underlying conceptualization of innovation. To map these substantial shifts, we construct domain ontologies following the Gioia methodology (Gioia, Corley and Hamilton 2013). This begins by identifying "1st order concepts" in innovation discourses as expressed in policy documents, which then interrelate to "2nd order themes" and "3rd order aggregate dimensions". This allows construction of an overall domain ontology (see section 6), which then can be compared to identify how understanding of innovation has changed in these documents.

The domain ontologies are constructed from historical documents related to innovation at European level. We consulted the document register of the European Commission and the publication office of the European Union. We consider innovation in its broadest sense ranging from product and service innovation to social and technological innovation and more. The overarching keyword for the search was thus "innovation", and because the working language of these institutions has overwhelmingly been in English, we have selected only English data in our search. Lastly, we have opted for only pdf file documents; they constituted a large majority of documents and they were exhaustive with specific dates of publication and intact. At the time of gathering the data, during 2019, the last year we included in our document search was 2018. Our search within the European Union database for documents dated prior to 31.12.2018 yielded 3066 documents. The same filtered search in the European Commission database yielded 128 publicly available documents making it 3194 overall.

Since we intended to gain insights particularly on the conceptualization of innovation (and institutional demands upon universities within these conceptualizations), we filtered these documents applying a number of criteria to eliminate those, which did not express any regulatory/institutional perspective towards the understanding of innovation. We did this through a preliminary analysis on abstracts, executive summaries and/or table of contents. Documents were removed if they fulfilled one or more of these thirteen conditions; a) documents in other EU languages, b) single country reports, c) innovation output of candidate countries, d) posters, e) executive summaries of full documents, f) conference proceedings sponsored by the European Commission g) duplicate versions of documents in both databases, h) documents outlining rules, monitoring and results of participation of third countries in EU framework programs, i) evaluation of Horizon 2020 and other European Commission funded projects, j) documents in which the use of the word innovation is unrelated to social or economic development processes (typically indicating either reform or change) k) documents published by Directorate-General of Innovation and Research which do not otherwise deal with innovation itself, l) documents focusing on other regions (i.e. Latin America). This filter process reduced the data set to 346 documents.

It should be noted that search outcome related to algorithm are subject to change over time (Goldman, 2006), which was the case for the publication database of the European Union we consulted. Exactly the same search with exactly the same criteria made in March 2020 resulted in 4 more documents that were not available in the previous search conducted in January 2019, while 7 documents that had been yielded before did not reappear. In this sense, the data carries a limitation. Nevertheless, we argue that the difference is too small to change the overall picture of the field, hence the results. The number of documents dated in each year is shown in figure 1.. As it can be observed, the number of innovation documents has dramatically increased since 2012, which we think, is due to the growing recognition and importance of innovation in addressing regional economic development and other complex societal challenges at the European level.

In order to start a coding process, we first skimmed the documents and searched the keywords of "innovation/innovate" and "university(ies)" / "higher education" within these individual documents. We then analysed the sentences with these keywords in each document, thereby generating codes for them. When generating a code only by analysing an individual sentence entailing above-mentioned keywords was not sufficient, we took either the preceding/subsequent sentences or the entire paragraph within which sentences are embedded into consideration to arrive at meaningful codes. Furthermore, when sentences with "innovation/innovate" were very similar semantically and in terms of institutional domain they represent in a single document, we coded only one of them. To illustrate, when there was 6 definitions of social innovation in a single document, we coded only one of them; as "definition of social innovation" in the form of 1st order concept. Other sentences in these groups were coded only if they focus on a different institutional domain (i.e. the role of civil society in social innovation).

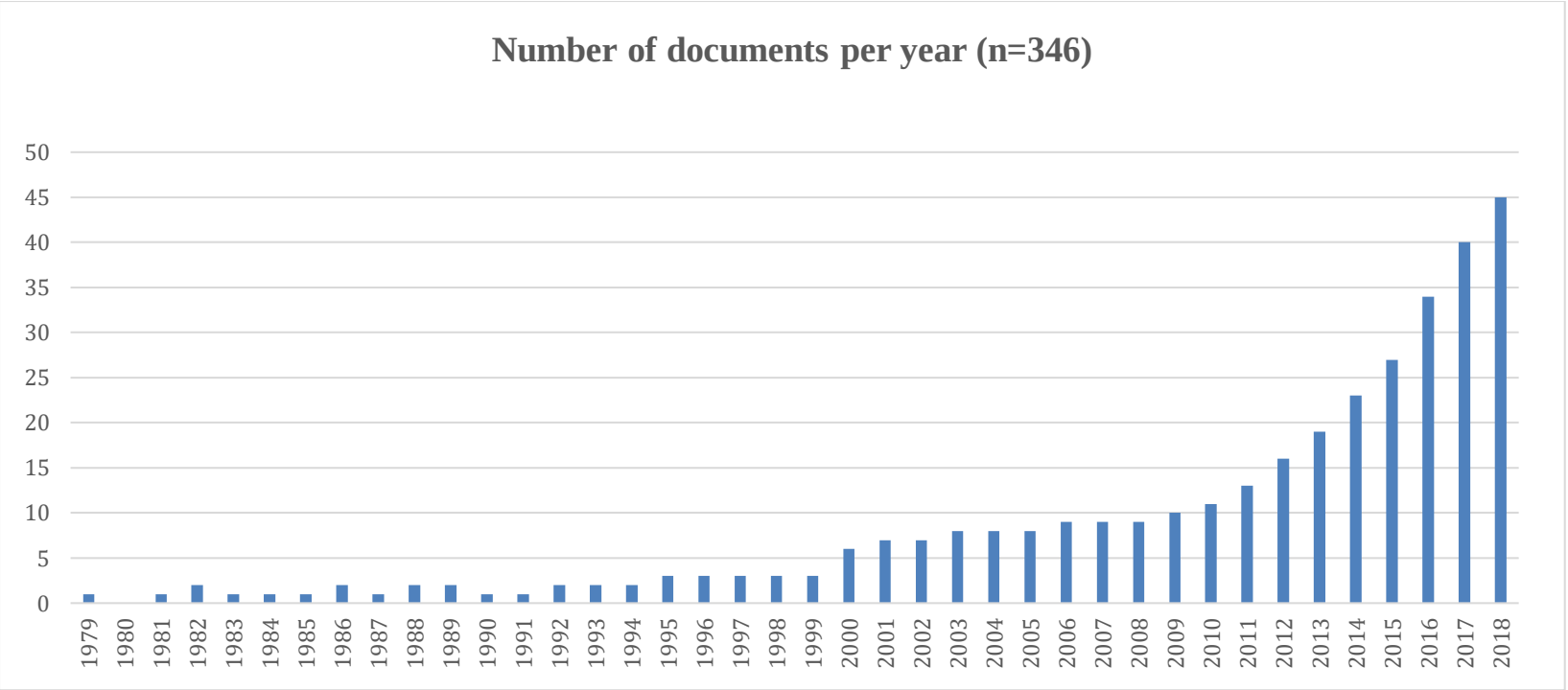

Figure 1. Distribution of analysed policy documents over the years

Overall, we constructed 3237 1st order concepts finding home in 62 2nd order themes. The 2nd order themes were then clustered in 5 aggregate dimensions: a) *towards a single marker and technological progress*, b) *towards an information (and knowledge society)*, c) *towards a place-based approach*, d) *changing conceptualization of innovation* and e) *evolving role of universities in fostering innovation*. We undertook the coding process manually. The application of the methodology developed by Gioia et al. (2013) including coding process into our policy documents is visualized in the table below.

Table 2

Application of methodology developed by Gioia et al. (2013) in analysing innovation documents

	1st order analysis (concepts)	**2nd order analysis (themes)**	**3rd order analysis (aggregate dimensions)**
Objective	Coding directly from the discourse of innovation documents	Organising 1st order concepts into themes	Organising 2nd order themes into aggregate dimensions
Frequency of iterations	2	2	4
Final number of concepts, themes and aggregate dimensions respectively	3237	62	5

Source: Own elaboration based partly on Germain-Alamartine and Moghadam-Saman (2019)

A representative sample of how our coding process ended up organized as 1st order concept, 2nd order theme and 3rd order aggregate dimension is provided in the table below drawing on four quotations that were coded.

Table 3

Coding process through representative quotes

Representative quotation	**1st order concept**	**2nd order theme**	**3rd order aggregate dimension**
'The foundation of STCELA arose from an awareness that innovation is often hampered not by technical factors but rather by market conditions, particularly where the market is excessively fragmented.' (CEC 1985, p. 6)	Market Fragmentation	Generative Cleavage	Towards a Single Market and Technological Progress
'Innovation can be defined at a number of levels. … A broader definition may be 'the necessary steps, managerial, commercial, technical and financial, to introduce a new, or an improved product or process into the market and place'. (EU 1997, p. 15).	Innovation at a Number of Levels	Innovation as a Non-linear and User-Involved Process	Changing Conceptualization of Innovation
'The aim of this [Flagship Initiative: Innovation Union] is to re-focus R&D and innovation policy on the challenges facing our society, such as climate change, energy and resource efficiency, health and demographic change.' (EC 2010, p. 10)	Re-focus of R&D and Innovation Policy	Innovation to Tackle Complex Societal Challenges	Changing Conceptualization of Innovation
'Universities are transformative spaces and have a particularly important role to play in social innovation development producing new knowledge or skills development in the disruptive social innovation domain.' (EC, 2018, p. 9)	Universities and Social Innovation	Contribution into Innovation as a Social and Environment Sensitive Concept	Evolving Role of Universities in Fostering Innovation

Having completed the coding, the codes for the individual documents were then arranged in time sequence to highlight their 1st order concepts and 2nd order themes. Critical junctures were identified by boundary processes in which their relative distance of items (in terms of these 1st order concepts and 2nd order themes) to their near neighbours were determined. Boundaries were then placed to reduce as far as possible the distance between the elements within a period; they were periods where the 1st order concepts and thus 2nd order themes were changing most quickly. On that basis, we identified three periods that we are interpreting as critical junctures, namely 1983-86 (economic, social and political integration of Europe), 1995-2000 (a shift from emphasizing industrial to information society), and 2008-2012, (the emergence of place based approaches). In the following sections, we elaborate on the process leading up to drawing boundaries to determine the critical junctures. We then turn to

provide a stylised overview of these critical junctures, and their impact on conceptualization of innovation and institutional demands upon universities.

4. Drawing boundaries between critical junctures and normal periods

Upon coding the documents, we identified the periods within the lifecycle of institutional field of innovation in which there was a sudden increase of emphasis on a particular concept/perspective. The identification of a period as a critical juncture thus starts with the year that involves the first rapid increase of codes attributed to a particular concept/perspective and ends with the year in which there is the first signs (codes) of finalizing ongoing debates over available alternatives and institutionalization of the chosen alternative. While it is expected that the number of codes would evidently rise due to an increase in the number of documents over the years, not all the increasing codes become institutionalized in the field, nor do they all end an ongoing debate between alternative options. This observation has allowed us to draw boundaries to determine critical junctures.

The first critical juncture, the period between 1983-1986, relates to the shifting economic, social and political integration of Europe. Prior to 1983, the number of related codes, mostly in the form of a need for a common market in the European Community, were 6. In the following four years, this number rises to 17, 19, 24, and 33 respectively (see figure 2), making it 93 codes overall for the critical juncture period. The last year, 1986, is also the year for which a code is attributed to sealing economic, social and political integration of Europe, namely that of Single European Act, for the first time.

The second critical juncture, the period between 1995 and 2000 concerns the transition from industrial to information society, which involves sub-dimensions of knowledge economy and knowledge society. Before 1995, the number of codes attributed to the need/implication for such a transition was around 28. For the following six years, the number of such codes increased to 22, 25, 27, 32, 34 and 37 respectively, (see figure 3) making it 177 overall. The year 2000 includes the first codes attributed to finalization of the debate and formalization of the chosen alternative, namely that of the Lisbon Strategy (drafted in 2000).

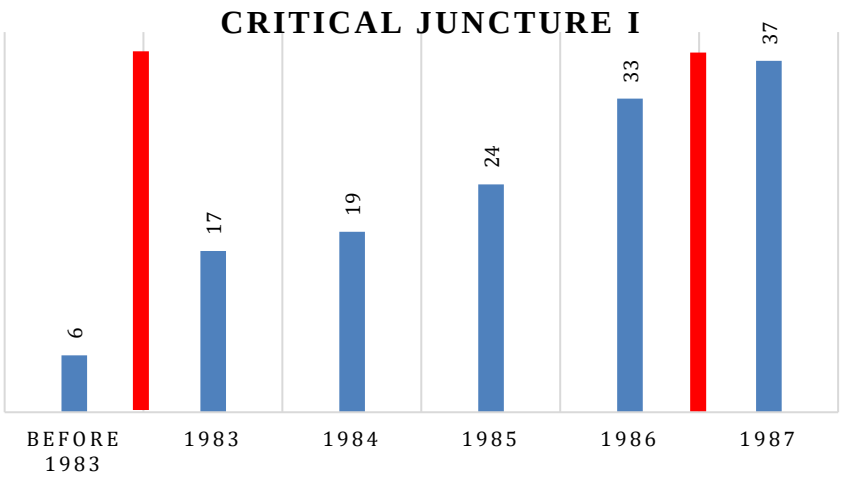

Figure 2. Critical Juncture I as demonstrated by the increasing number of related codes over the years

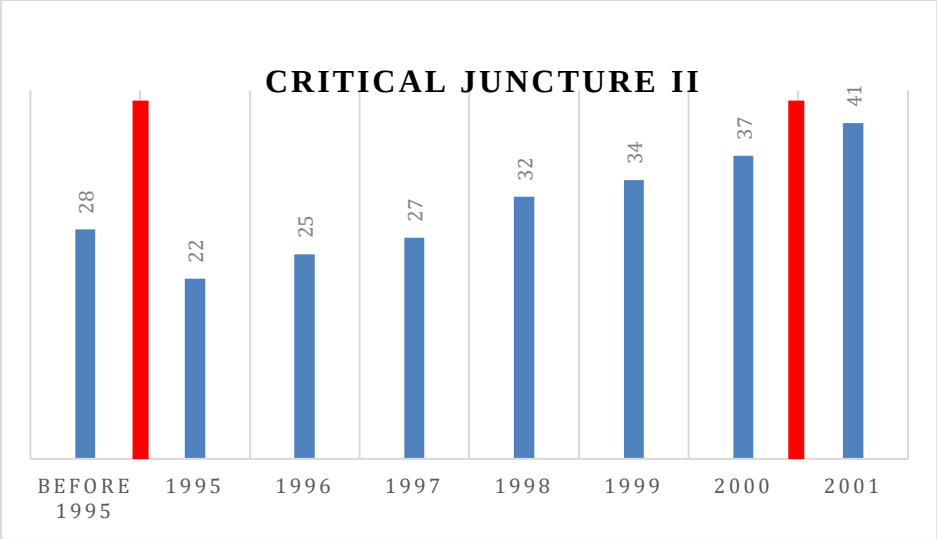

Figure 3. Critical Juncture II as demonstrated by the increasing number of related codes over the years

The third critical juncture, (2008-12) relates to the shift towards a place-based approach within the field. In the 28 years explored to 2008, the number of codes that address/imply place-based approach towards innovation were around 73. For the succeeding five years, the number of such codes were 18, 26, 35, 51 and 55 respectively, (see figure 4) totalling to 185 overall. The debate about place-neutral versus place based innovation policies finalized formally in 2012 with the publication of a manual guide to implementing smart specialization strategies (RIS3) and

inauguration of a Joint Research Centre on smart specialization in Seville-Spain, thereby attempting to institutionalize the shift towards the latter.

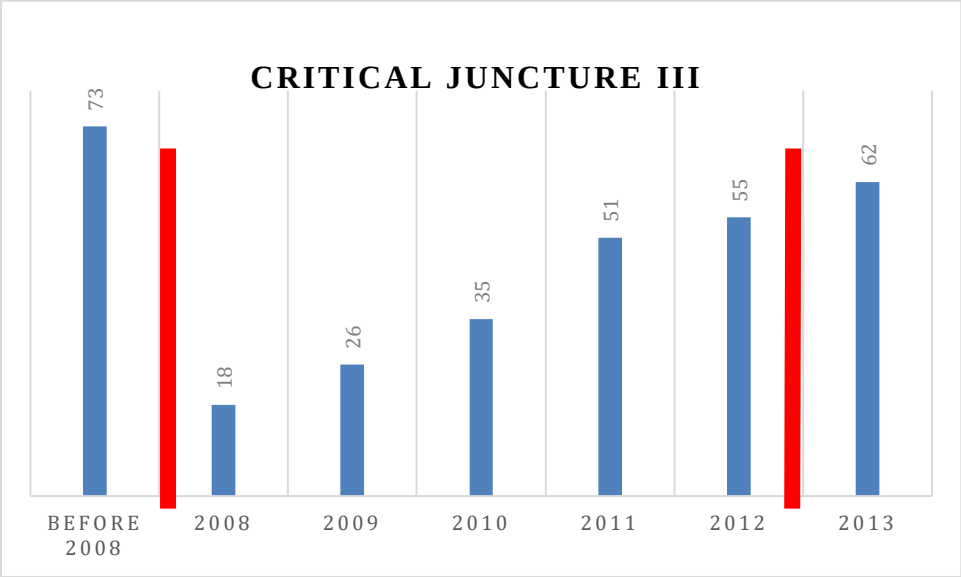

Figure 4. Critical Juncture III as demonstrated by the increasing number of related codes over the years

5. Critical junctures, changing conceptualization of innovation and impact on universities

5. 1. Critical juncture I (1983-1986): economic, social and political integration of Europe

The first critical juncture for European innovation was the point at which a group of policy actors constructed the domain as a field requiring European competence. The starting point of innovation debates was the prevalent feeling that Europe fell behind the developed world such US and Japan in R&D expenditure, productivity output, research commercialization, technology transfer and other relevant indicators (CEC 1982). European firms did not perform well in innovation compared to their transatlantic counterparts despite increasing purchasing power per capita at the time and the diagnosis was that Europe lacked economies of scale, had market fragmentation and significant shortcomings in infrastructure, all of which hampered innovation. As early as 1979, Commissioner Davignon had mandated leading IT firms to devise a research programme to raise European IT competitiveness, leading to the €12m pilot ESPRIT programme (Sharp, 1990). SPRINT (Strategic Program for Innovation and Technology Transfer) was created in 1984 to encourage technology transfer to small and medium sized enterprises (see subsequent paragraph), and the

First Framework Programme launched in 1984 to fund research to strengthen competitiveness.

In parallel with this, this period also witnessed significant wider developments at the European level, most notably the accession of Spain and Portugal (1986), and the agreement of the Single European Act (1986). In tandem with market fragmentation, and low performance indicator in innovation outputs compared to USA and Japan, these generated a cleavage opening windows for change of directionality in innovation discussions, as this document sets out:

> European industries can no longer do without the economies of scale, which are possible in this context. An innovation which would not be viable on the national market of 10 or 50 million possible buyers may well become so when the market size is 320 million, as may potentially be the case in Europe." (CEC 1986, p. 4)

Although the causes of low innovation capacity in Europe were visible since the late 1970s, as the Davignon Roundtable suggested, in this critical juncture the possibility of significant change for the future of Europe started to be discussed based on increasing the intensity of knowledge activity. The two most obvious choices at that point were accelerating economic, social and political integration of Europe, or maintaining the EEC as a Customs Union. The Customs Union option would have precluded the creation of new competencies, and the choice to create the single market created the opportunity for new competencies in support of the market, to which the Framework programme, SPRINT and ESPRIT corresponded. Prior to this critical juncture, innovation had been a scientific, economic, industrial and technological concept. Whilst these labels did not vanish or lose their frequency in policy discussions, 'market innovation' started to gain more emphasis and quickly became another source of innovation in late 1980s and early 1990s thanks to the move towards a common market and European enlargement.

Even though it took 7 years for the single market to be established in 1993, the moment of change from the perspective of innovation came in 1986 when the member states committed to creating a new institutional space for the European Union, with additional competencies and institutions to underpin this single market. Despite the lengthy negotiations, the immense scale of the change and its ramifications on social,

economic and political sphere, the 3 years between 1983-1986 during which the fundamentals for change were laid, can be considered as a relatively short period of time accommodating developments taking place rapidly.

The change was utterly encompassing in the sense that common market meant free movement of goods, capital, services and labour. The Framework Programme created the notion of European added value, in that support was only to be given for projects that demonstrably could not be achieved by individual research teams in national research systems. Following the critical juncture, innovation discussions generated some strategies that were very much in line with the change. One of the most illustrative examples was SPRINT as a strategy. The initiative aimed at improving the competitiveness of European firms and products, mitigating market fragmentation, building capacity at regional level, fostering transnational cooperation between member states and investing in infrastructure. Between 1983-1988, SPRINT was in its pilot phase whilst there were discussions regarding its appropriateness and effectiveness. In 1989 April, the Council approved its continuation into main phase (1989-1993) and increased its funding.

5.1.1. Impact of Critical Juncture I on conceptualization of innovation and institutional demands upon universities

The critical juncture had a significant impact on our understanding of innovation at European level and institutional demands upon universities. We demonstrate this in Table 2 and Table 3 respectively below through our analysis of most frequent 1st order concepts and the 3rd order aggregate dimension to which they are related during this critical juncture.

Table 2

Most frequent 1st order concepts and related 3rd order aggregate dimension during Critical Juncture I

1st Order Concept	3rd Order Aggregate Dimension
• The need for a common market • Market fragmentation • Technological investment • Falling behind USA & Japan • Technological upgrading • Lack of economies of scale • Investing in infrastructure • The need for transnational knowledge flow	Towards a Single Market and Technological Progress
• Technological innovation • Innovation as an economic and commercial concept • Scientific innovation • Market innovation • Single market as an opportunity for innovation • Industrial innovation	Changing Conceptualization of Innovation

During the first critical juncture and onwards, the notion that innovation is a research and technology driven process pulled by market opportunities in Europe was consolidated. While scientific and economic conceptualization of innovation persisted, technological conceptualization of innovation got strengthened and market emerged as a significant dimension. These changes taking place within the field started to gradually permeate universities as well. As such, what was expected from higher education institutions were engagement focusing primarily along these lines: technology transfer, research commercialization, assisting regional firms to take advantage of new market opportunities in Europe, and investing in patenting, licensing, and science parks, and assisting transnational inter-firm collaboration (see table 5). These demands seem to be based on a technology and market driven economic growth logic. Universities were thus considered as actors that are supposed to invest in technological innovation and research commercialization, and collaborate primarily with industry.

Table 5

Most frequent 1st order concepts regarding institutional demands upon universities and the aggregate dimension to which they relate) during critical juncture I

1st Order Concepts	3rd Order Aggregate Dimension
• Research commercialization • Investing in technology transfer • Investing on patenting and licensing • Establishing science parks • Assisting regional firms to take advantage of new market opportunities • Assisting trans-national inter-firm collaboration	Evolving Role of Universities in Fostering Innovation

5. 2. Critical Juncture II (1995-2000): transition from industrial to information society

The second critical juncture was a point at which significant developments at the global scale interacted with the embryonic European innovation policy that began via several small-scale experiments, which in the 1990s were slowly becoming more important and visible as a policy domain. By the mid 1990s, the Single Market was fully operational, there was increasing globalisation with the fall of the Iron Curtain and the emergence of Asian tigers. There was a further enlargement to 15 members, and ideas were emerging for a single European currency. It was a decade during which the notion was consolidated that innovation is driven by science and technology and pulled by dynamic markets. In parallel were the first signs that digital technologies were beginning to function as general platform technologies with the potential to create new business practices and fields.

These diverse pressures came together to generate a cleavage, which we refer here as critical juncture II. An archetypal Commission document at the start of the period summarized it thus:

> The advent of the information society is a major event for innovation. It is creating new occupations and innovative products, such as distance learning services and remote services in medicine or the development of new software and applications. (CEC, 1995, p. 11).

In this period, the percentage of Internet users in the developed world rose from around 10% in 1994 to 31% in 2000. (International Telecommunication Union, 2015). Globalization of technologies, markets and knowledge was accelerating, partly due to the rise of digital technologies and the new media.

What can be observed here is that the initial discourse that opened the window of opportunity was the idea of the information society. Just as the IT industry via the Davignon Roundtable had opened the window of opportunity for the first critical juncture, this information society discourse acknowledged the need to increase the uptake and access to information and information technologies, and was sufficiently attractive to achieve purchase within the existing institutional framework. In this critical juncture, we observe that the "Information Society" notion was gradually infiltrated with the idea of the "Knowledge Society", where the application of knowledge capital drives productivity growth and welfare gains.

We argue that there is an interaction between the discourses of the information society and the knowledge society even though the former ultimately evolved into the latter, accompanied and facilitated by the contemporaneous globalization. Although the notion evolved in the subsequent decade to accommodate the knowledge economy, at this critical juncture there was a clear shift in the conceptualization. Innovation became seen as something more than just the preserve for a few high technology companies, but something with implications for European society as a whole. Before this critical juncture, it could have plausibly remained the domain of small instruments and interventions such as ESPRIT, but this juncture saw innovation morph into something demanding a more general policy response. In the previous period, there was an acceptance that the benefits of innovation would flow to the most successful regions, whilst in this period much more emphasis was placed on ensuring that all regions were equipped to deal with these changes.

In addition, there are two related phenomena here; information society and globalization. What was being referred to here with globalization was an alternative in which distance was no longer an obstacle for business and innovation and globalization of world economies through digital technologies was a phenomenon to be possibly capitalized upon. Information society was perceived as a concept through which a transition from innovation being confined to high tech businesses and only to few individuals to innovation for everyone and all businesses could be realized. The two together offered a serious alternative path for the innovation in Europe of which policymakers decided to choose. The change was rapid as shown by the dramatic

increase in the number of internet users in just few years. This was accompanied with equally swift globalization strategies at many levels: globalization of firms, globalization of capital markets, globalization of production techniques, and globalization of financial markets (CEC, 1995).

Structuration of the change across the field was relatively high; new units were established with special responsibility for the information society; new instruments were created, the Regional Information Society Initiative, to mobilise new regional partnerships to identify the necessary steps to build the information society in their regions. The DG for Agriculture sought to encourage the development of information society strategies for rural regions to protect them during the secular shift to the information (and later knowledge) society. Information society discourses became the dominant departure point in innovation discussions. Member states were encouraged to develop national strategies to react to the changes driven by this discourse. Several member states developed talent attraction schemes in order to capture exogenous knowledge. Education policy was revised to be in line with the demands of a knowledge society: to nurture highly skilled, mobile individuals.

5.2.1 Impact of Critical Juncture II on conceptualization of innovation and institutional demands upon universities

The second critical juncture has also left a significant footprint on our understanding of innovation and what is expected from universities. A table summarizing most frequent 1st order concepts and 3rd order aggregate dimensions to which they relate during this critical juncture is provided below.

Table 3

Most frequent 1st order concepts and related 3rd order aggregate dimensions during critical juncture II

1st Order Concept	3rd Order Aggregate Dimension
• The rise of information society • Supporting knowledge-based economy • The rise of digital technologies • Globalization of world economies and labour market • Investing in digital technologies • Towards knowledge based society • Investing in ICT • Investing in talent and skills	Towards and Information (and Knowledge) Society
• Knowledge and digital technologies as driver of innovation • Innovation as a systemic process • Innovation as a regional process • Digital innovation	Changing Conceptualization of Innovation

During this period and onwards, there was a greater recognition that innovation is rather a systemic process driven by knowledge and information/digital technologies and facilitated by ongoing globalization. Intense interaction between government, industry and academia was seen necessary to foster innovation in various regions. National innovation systems ad regional innovation systems became increasingly accentuated. In addition, knowledge economy/society narrative meant that innovation was seen to be not only for some regions with advanced economy and successful sectors but for all regions and societies. Accordingly, the role of universities has likewise evolved in a similar direction. Universities started to be seen as actors that could channel exogenous knowledge to the geographies in which they are located, mediate between government and industry, attract and retain talent for the knowledge economy and collaborate with the then emerging ICT sector as well as non-high technology sectors. Furthermore, they were expected to play an important role in establishing inter-regional partnerships and mobilize their capacity to spur regional innovation. A table summarizing most frequent 1st order concepts and the related 3rd order aggregate dimension during the critical juncture II is provided below.

Table 6

Most frequent 1st order concepts regarding institutional demands upon universities and the aggregate dimension to which they relate during critical juncture II

1st Order Concepts	3rd Order Aggregate Dimension
Institutional Demands of Critical Juncture I + • Increasing collaboration with government and industry • Facilitating diffusion of knowledge and information technologies • Supporting regional innovation • Supporting start-ups and spin-offs • Attracting and retaining talent • Assisting internationalization and globalization of firms' innovation strategies • Supporting local and regional (IT/ICT) clusters • Supporting interregional partnerships	Evolving Role of Universities in Fostering Innovation

The underlying logic of these demands seems to be based on the notion that innovation is a systemic and regional process driven by knowledge, information technologies and talent with the expectation of economic returns. Universities therefore have inevitably become a key actor in the realisation of these aspirations.

5. 3. Critical Juncture III (2008-2012): the shift towards a place-based approach

The 2000s witnessed a significant evolution of innovation debates, following the directions set in the critical juncture II, a shift in emphasis from infrastructure provision to stimulating new kinds of behaviours to use ICT infrastructures. Knowledge became understood as the most important driver of innovation and a stream of policy documents emerged aimed at transforming Europe into a dynamic, knowledge-based economy. In this period, the Lisbon strategy was formulated creating a mechanism to increase (business) R&D spending per member state, changing the mechanisms from one of enabling activities and strategies to open coordination towards common goals. Towards the end of the decade a shift in discourse emerged, particularly regarding the R&D deficit between Europe and its transatlantic counterparts:

> The EU's deficit in R&D expenditures vis-à-vis the United States is one that primarily reflects a shortfall in EU R&D spending in the production of IT goods and services…. In short, the R&D deficit appears to be a symptom rather than the cause, of weakness in the EU's capacity to innovate. The cause is rather the structure and dynamics of the region's enterprises and industries (EC, 2009, p. 13).

A critical shift was the increasing emphasis on regional characteristics and structure of industries across various geographies, reflecting an accumulation of persistent problems such as growing territorial disparity and innovation gap within EU and the uneven consequences of austerity that were reinforcing those disparities. There was a realisation that the information society may have offered a level playing field to all regions but this did not lead to building knowledge exploitation capacity in all regions. Together with the 2008 economic crisis and its constraining impact on innovation budgets, these factors ultimately generated this cleavage, leading to a renewal of local focus and efficient use of financial resources in innovation agenda.

The ongoing contemporaneous discussion regarding place-neutral versus place-based economic development policies shifted inexorably towards the latter, and indeed multiple place-based approaches emerged. Although the origins of place-based approaches can be traced back to 1990s and early 2000s with small instruments such as RIS (Regional Innovation Strategies), and RITTS (Regional Innovation and Technology Transfer Strategies and Infrastructures), it was during this critical juncture that it was largely debated and an increasing consensus on it emerged. A group of experts working with Directorate of Regional and Urban Policy came up with the concept of 'constructed regional advantage': an expert group working for the Directorate of Research and Innovation invented the concept of 'smart specialization'. Smart specialization was the fashioned version of place based approach and was quickly embraced by the Directorate of Regional and Urban Policy.

Steps to institutionalize the chosen alternative came early and rapidly. It took only few years from the formulation of smart specialization concept in 2009 to it being made ex-ante condition for regions to access structural funds in 2014 and onwards. The year 2012 was also significant in the sense that Directorate for Regional and Urban Policy and Directorate for Research and Innovation assembled expert teams with the task of monitoring formulation of RIS3 strategies in EU countries. In 2011, a Smart

Specialization Platform to support and guide regions in formulating, monitoring and implementing RIS3 was established within the European Commission Joint Research Center in Sevilla, Spain and in 2012 it was inaugurated. It has assisted EU regions in several areas ranging from providing peer review for their smart specialization strategies to monitoring, expertise and advice to policymakers. The advent of smart specialization into the institutional field was so swift that it has been a 'perfect example of policy running ahead of theory' (Foray, David and Hall 2011, p. 1).

One striking change was that the formulation of the entrepreneurial discovery process (EDP). This concept suggested that the region's strategy should be decided collectively by giving opportunity to participate in decision-making process to not only central government but also regional authorities, entrepreneurs and other interested actors (Foray David & Hall, 2011). The change was intended to allow regions to move beyond picking generic one-size-fits-all strategies for specific sectors such as nanotechnology or ICT, to identify their own real strengths. This turn towards place-based innovation policies has been one of the most encompassing change introduced to the institutional field, considering all the institutions, organizations and individuals affected either directly or indirectly.

5.3.1. Impact of Critical Juncture III on conceptualization of innovation and institutional demands upon universities

Since the third critical juncture, the concept of innovation has broadened tremendously while expectations on universities have soared. A summary of the most frequent 1st order concepts and the related 3rd order aggregate dimensions during this critical juncture is provided in the table below.

Table 4

Most frequent 1st order concepts and related 3rd order aggregate dimensions during critical juncture III

1st Order Concept	3rd Order Aggregate Dimension
• Emergence of grand societal challenges • Smart specialization • 2008 economic crisis • Fostering innovation in all regions • Growing territorial disparity and innovation gap within the EU • Supporting regional and local actors • Entrepreneurial discovery process • Benefiting from regional and local strengths • Supporting regional renewal and diversification • Greater mobilization of structural funds for innovation • A new approach towards understanding R&D deficit in Europe	Towards a Place-Based Approach
• Place-based innovation • Innovation as a territorial, and local process • Innovation to address grand societal challenges • Innovation as an inclusive and multi-actor process • Social innovation • Eco-innovation • Green innovation • Frugal innovation • Responsible innovation • Quadruple helix	Changing Conceptualization of Innovation

What the third critical juncture brought was the perspective that both innovation and grand societal challenges were increasingly localized manifesting differently throughout the continent. The importance of local actors and capabilities in transformative innovation ecosystems has increased. Policymakers started to expect innovation manifest in every region including peripheral and rural areas. Furthermore, other actors such as regional authorities, entrepreneurs, non-governmental organizations, and citizens have been perceived as important contributors into innovation process. There has also been a discourse that innovation should go beyond economic growth and address grand challenges. Innovation has thus started to be seen

as a social, environmental, mission-oriented concept, increasingly entailing regional and local participatory process. As such, the demands upon universities have also evolved along these lines and become multilayered. Universities have since then been expected to contribute into other types of innovation as well and tackle societal challenges with these innovations, collaborate with non-industry partners and broader societal groups, and guide entrepreneurial discovery process within the context of smart specialization. The following table summarizes the institutional demands upon universities during this period.

Table 7

Most frequent 1st order concepts regarding institutional demands upon universities and the aggregate dimension to which they relate to during critical juncture III

1st Order Concepts	**3rd Order Aggregate Dimension**
Institutional Demands of Critical Juncture I and II + • Addressing grand societal challenges through innovation • Playing an active role in smart specialization strategies • Benefiting from research and innovation to tackle global challenges • Increasing social impact of research and innovation • Involve public/users in innovation process • Increasing collaboration with local actors • Contributing into social innovation • Assisting entrepreneurial discovery process • Contributing into eco-innovation and green innovation • Collaborating with other societal partners (i.e. ngo) • Contribute into well-being of local communities	Evolving Role of Universities in Fostering Innovation

The overarching aim of these demands seem to be encouraging universities to go beyond the triple helix of regional interaction and entrepreneurial university model and embark on a trajectory that would lead to greater engagement with broader societal partners, fostering different types of innovation, collaborating with regional

and local stakeholders, contributing into different part of the innovation processes and through these, address grand societal challenges (Uyarra, 2010).

6. Domain ontologies regarding overall conceptualization of innovation and institutional demands upon universities

Over the years, the institutional field of innovation in Europe has evolved significantly, to the extent that it now accommodates different understandings of innovation with a different degree of influence as well as numerous actors involved in the innovation process. We developed a domain ontology based on 2nd order themes that relate to the aggregate dimension of "changing conceptualization of innovation" to demonstrate this diversity and reflect on tensions and compatibility between these divergent approaches towards innovation. An overview of the current characteristics of the field can be seen in the figure below.

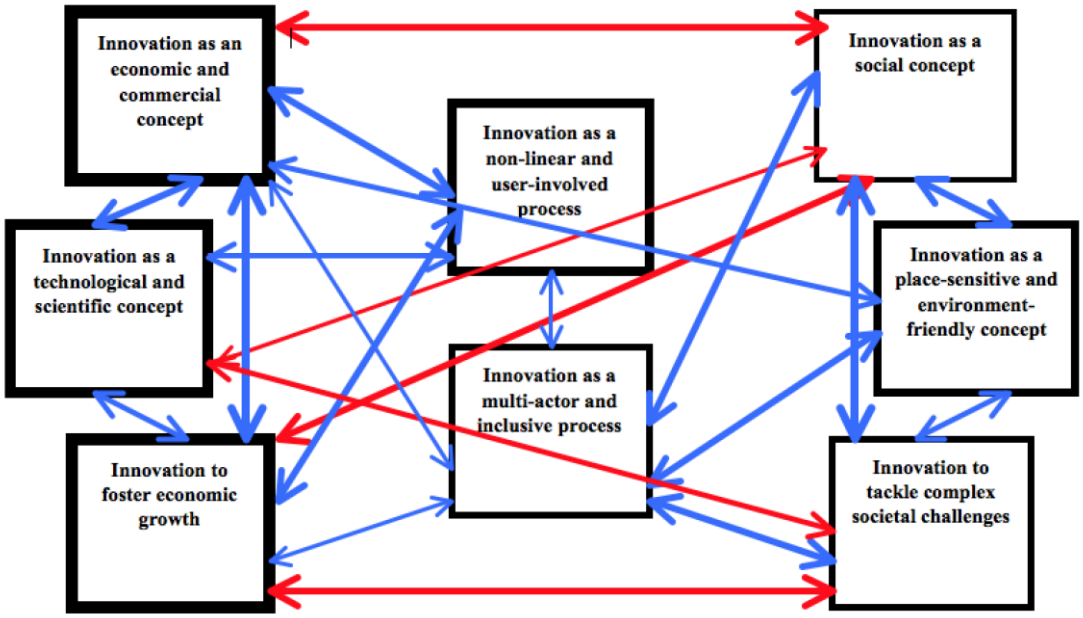

Figure 5. Map of domain ontology regarding overall conceptualization of innovation. Darker frames represent greater coverage within the field as shown by the number of codes finding home in this particular theme while red and blue arrows indicate primarily tensions and compatibility respectively between different conceptualizations, as interpreted by the authors.

The field is now occupied with different approaches towards innovation that do not necessarily possess compatible underlying logics and therefore reflect emerging tensions. We argue that one tension exists between economic, commercial, scientific and technological conceptualization of innovation and approaching to innovation as a social process with societal impact. To illustrate, a technological innovation with significant commercial value may not necessarily remedy a societal challenge. Social innovation might instead offer some solutions for alleviation of this problem without generating much of an economic value or requiring implementation of a novel technology, however, it is still not equally powerful within the field as shown by the number of codes. Similarly, whether innovation should primarily foster economic growth or tackle complex societal challenges is another important tension as the latter may not necessarily involve or lead to economic growth. On the other hand, underpinnings of some approaches towards innovation seem to work well together. For instance, economic, scientific, technological and commercially conceptualized innovation serves to the logic of fostering economic growth. Furthermore, prescribing the role of tackling complex societal challenges to innovation involves recognition of innovation first as a social concept and process. Overall, we observe two main clusters here as can be seen in the figure, left and right, that seem to be compatible among each other while place-sensitive and environment friendly concept of innovation may potentially bridge this divide in the future.

Similar underlying tensions and compatibility is likewise reflected on institutional demands upon universities. We developed another domain ontology based on 2nd order themes that relate to the aggregate dimension of "evolving role of universities in fostering innovation" to reflect the full spectrum of innovation-related demands upon universities and indicate tensions as well as compatibility among them. An overview of the range of institutional demands upon universities within the field is presented in the figure below.

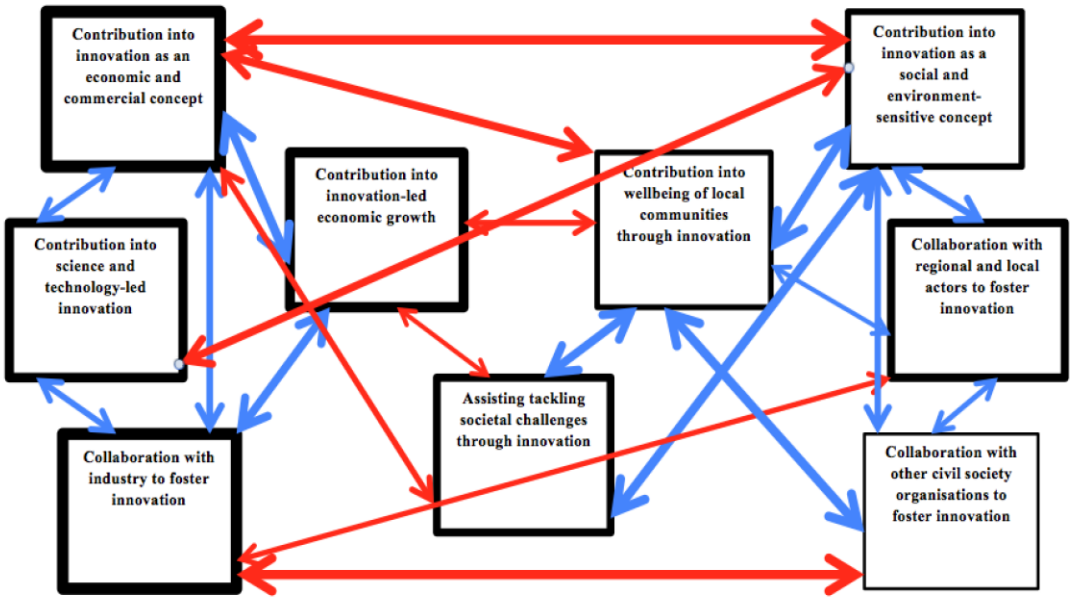

Figure 6. Map of domain ontology regarding overall innovation-related institutional demands upon universities. Darker frames represent greater emphasis on the demands within the field as shown by the number of codes finding home in this particular theme while red and blue arrows indicate primarily tensions and compatibility respectively between the demands within university setting, as interpreted by the authors.

Similar tensions, partly stemming from the different conceptualization of innovation can be found here as well. The first one is between innovation demands with economic, commercial, scientific, or technological underpinnings and those with a social and environment-sensitive background. One difficult choice, for instance, would be whether a university should establish a science park or social incubator, or both. A similar dilemma exists for another related tension: should a university organize itself in a way to collaborate intensively with industry to contribute to regional innovation or should it engage in a different organizational arrangement process to better collaborate with other civil society sector such as non-government organizations and cooperatives to address societal challenges through innovation? Within the university context, each preference would require a different process of organizational design, institutional arrangements, and mobilization of financial and academic resources. We again observe two clusters here, left and right, with different underlying rationales. On both sides, the demands seem coherent between each other and relatively easier for a university to make necessary organizational arrangements as each one serves fulfilling

another within the same cluster. Furthermore, it is also important to note that despite the multiplicity of demands and greater emphasis on social/environmental related contributions and collaboration with other actors, economic/scientific/technological related contributions and collaboration with industry to foster economic growth are still the most articulated demands within the field.

7. Discussion and conclusion

In this paper, we have sought to gain insights into the critical junctures within the history of innovation in the EU and how they impacted conceptualization of innovation as well as institutional demands upon universities. We have firstly characterised the European innovation field as having been affected by three moments of fairly fundamental shift, namely economic, social and political integration of Europe through single market, a transition from industrial to information society and directionality towards place-based approach. We then analysed how these shifts influenced the conceptualization of innovation and expectations upon universities demonstrating that these critical junctures have significantly broadened understanding of innovation and this broadening have resulted in emergence of multi-layered demands upon universities.

The innovation discourse in the field emerged from a very narrow frame, namely improving the competitiveness of Europe's Information Technology champions, (Sharp, 1990). Innovation has since then broadened across many dimensions simultaneously to be a ubiquitous element of several European policies, ensuring welfare and cohesion, and requiring action and consent from citizens and civil society. The earliest version of innovation discourse was almost a static conception of the deployment of knowledge within particular firms to improve efficiency; these firms would then disproportionately thrive and hence improve Europe's economic performance (Sharp, 1990). Since then, there have been modifications to the approach to innovation that reflect quite different perspectives on innovation, and involve different actors and objectives in these conceptualisations.

The first is that there has been a shift towards an increasingly dynamic understanding of innovation, away from orthodox static economic readings to more heterodox, evolutionary readings (Dosi et al., 1988; Nelson & Winter, 1982). In these

perspectives, innovation leads to shifting economic trajectories; economic trajectories shift slowly over time with places future potential being affected by past performance. The second is that there is more emphasis on the role of agency in innovation process, and on the role that agency plays in affecting dynamism (Uyarra et al., 2017); but agents are not purely economically rational actors, and are not always exclusively concerned with stimulating innovation. Organisational structures affect knowledge management capacities and not all organisations have structures that are intended to stimulate all types of innovation. The third is the recently articulated new objective of innovation: addressing tackling societal challenges (Mazzucato, 2018; Kuhlman & Rip, 2018). This requires a departure from purely economic and technological conceptualisation of innovation but not all actors involved in innovation process are institutionally prepared, supported and capacitated for such a shift. In addition, although tackling complex societal challenges requires greater input from social sciences and humanities (SSH) and involvement of public sector, the European Commission has so far prioritized mainly the impact of SSH on private sector in ex-ante evaluation of Horizon 2020 grant applications in the Societal Challenges category (de Jong & Muhonen, 2020). While there have been alternative schemes to capture the societal impact of research and innovation SSH disciplines have to offer (Muhonen, Benneworth & Olmos-Penuela, 2020), they have neither yet fully permeated European universities, nor have they so far been institutionalized across member states and the EU.

The fourth is the increasing importance of place in affecting economic development processes (Martin and Sunley, 2007). This brings in the issue of geography, and from a geographical perspective, a similar process may operate quite differently in different places because of the nature of that place; one cannot assume for example from this perspective that smart specialisation can operate similarly in dissimilar places (Grillitsch, 2016). The final element is the issue of civil society, its role in innovation process and the need for societal consent over the policies stimulating innovation and research. This is most recently manifested in the emergence of concerns around "Science with and for Society" in the flagship Horizon 2020 programme as well as increasing concern with the ethical, legal and social aspects of innovation, elevated by the debate around the need for responsible research and innovation (Fitjar, Benneworth and Asheim, 2019).

In some areas, those different conceptualizations can be reasonably resolved with each other; dynamism and geography have come together in the notion of evolutionary economic geography that purports to explain the role that places play in structuring their own longer term change trajectories. But in other areas, those conceptualizations may conflict with each other and create contradictions, particularly between those models with an economic grounding in which economic processes have primacy and other modes of explanation. These underlying contradictions ultimately affect universities as they are increasingly expected to contribute into diverse set of innovation processes. One fundamental contradiction already starting to become evident is between economic and social conceptualisations of agency around the role of universities in supporting innovation (Cinar & Benneworth, 2020). Policymakers envisage universities as important actors fostering social innovation, but at the same time, universities are not social innovation development agencies whose only concerns are with stimulating social innovation. They have other strategic priorities that are also based on economic and technological grounding and achieving successful alignment of those priorities simultaneously is an extremely complicated process. Furthermore, universities are not monotype organizations: they have evolved to have different identities (e.g. entrepreneurial, comprehensive, technical etc.). As such, their transition trajectory to meet all these demands will also be different and thus requires different set of incentives.

At the time of writing, Covid-19 was declared to be a pandemic and it triggered economic recession in almost all countries. While we are certain that the European innovation field has entered into another critical juncture as Covid-19 related developments fulfil the necessary criteria to be classified as such, we argue that it is too early to make predictions about how it would impact innovation and universities as the process still evolves. However, we expect greater emphasis and channelling of resources into health-related innovations, a change in the geography of production systems and a new set of demands upon universities particularly on the realm of societal impact of research and innovations due to the sociological nature of the pandemic.

In this paper, we are therefore keen to assume a teleological extrapolation from the past and present into the future in that this increasing diverse conceptualization of innovation in Europe will continue. Indeed, it is the growing tensions between these different conceptualizations and difficulty it creates for universities, which strikes us as being the most significant finding in this paper. In the past, conceptualizations of innovation have been sufficiently coherent to allow this broadening without these tensions becoming obvious in implementation. But now, there are so many versions of innovations and actors involved, with so many potentially incompatible academic underpinnings, that this might affect the ultimate viability of the innovation and universities' ability to deliver it. This conceptual diversity is a great strength for innovation, allowing it to become ubiquitous, but at the same time we may now be facing a turning point where that very conceptual diversity and richness becomes a source of weakness and simultaneously paralyze universities' ability to contribute into innovation and generate broader societal impact.

REFERENCES

Arbo, P. & Benneworth, P. (2007). Understanding the regional contribution of higher education institutions: A literature review. OECD, Directorate for Education, Working Paper N. 9, (1), 1-78.

Borras, Susana. (2003). *The Innovation policy of the European Union: From government to governance*. Edward Elgar Publishing.

Cantwell, J. (2004). Innovation and competitiveness. In Fagerberg, J., Mowery, D., Nelson, R. (Eds.), *Handbook of Innovation*, pp. 541-567. Oxford University Press.

Cinar, R. & Benneworth, P. (2020). Why do universities have little systemic impact with social innovation? An institutional logics perspective. *Growth and Change*. 10.1111/grow.12367

Coenen, L., Hansen, T., & Rekers, J. V. (2015). Innovation policy for grand challenges: An economic geography perspective. *Geography Compass, 9*(9), 483-496.

Commission of the European Communities (1982). *Concerning a plan for the transnational development of the supporting infrastructure for innovation and technology transfer (1983-1985).* Communication from the Commission to the Council and proposal for a Council decision. (COM 82 251). Final. Brussels: Belgium.

Commission of the European Communities (1985). *Plan for the transnational development of the supporting infrastructure for innovation and technology transfer*. (COM 85 274). Final. Brussels: Belgium.

Commission of the European Communities (1986). *Extension and revision of the 'Plan for the Transnational Development of the Supporting Infrastructure for Innovation and Technology Transfer (SPRINT Programme).* Communication from the Commission to the Council and proposal for a Council decision. COM (86) 483. Final. Brussels: Belgium.

Commission of the European Communities (1995). *Green paper on innovation*. COM (95) 688. Final. Brussels: Belgium.

Cortell, A. P. & Peterson, S. (1999). Altered states: Explaining domestic institutional change. *British Journal of Political Science, 29*(1), 177-203.

De Jong, S. P. L., & Muhonen, R. (2020). Who benefits from ex-ante societal impact evaluation in the European funding arena? A cross country comparison of societal impact capacity in the social sciences and humanities. *Research Evaluation, 29*(1), 22-33.

Dosi, G., Freeman, C., Nelson, R., Silverberg, G., and Soete, L. (1988). *Technical Change and Economic Theory*. Pinter.

Edwards-Schachter, M. (2018). The nature and variety of innovation. *International Journal of Innovation Studies, 2*(2), 65-79.

Enders, J. & de Boer, H. (2009). The mission impossible of the European University. Institutional confusion and institutional diversity. In A. Amaral, G. Neave, C. Musselin, & P. Maassen (Eds.), *European Integration and Governance of Higher Education and Research*. Springer.

European Commission (2009). *Knowledge for growth. Prospects for science, technology and innovation.* Brussels: Belgium.

European Commission (2010). *Europe 2020. A European strategy for smart, sustainable and inclusive growth*. Brussels: Belgium.

European Commission (2013). *Developing new markets for eco-innovation with a special focus on water*. 13th European Forum on Eco-Innovation. Brussels: Belgium.

European Commission (2018). *A European ecosystem for social innovation*. Luxembourg.

European Union (1997). *Practical guide to regional innovation actions. Regional innovation strategies (RIS), Regional innovation and technology transfer strategies (RITTS)*. Luxembourg.

Fitjar, R. D., Benneworth, P., & Asheim, B. (2019). Towards regional responsible research and innovation? Integrating RRI and RIS3 in European innovation policy. *Science and Public Policy, 46*(5), 772-783.

Foray, D. David, P. A., & Hall, B. (2011). *Smart specialization: From academic idea to political instrument, the surprising career of a concept and the difficulties involved in its implementation.* MTEI Working Paper. <https://infoscience.epfl.ch/record/170252> accessed 13 Feb 2019.

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational Research Methods, 16*(1), 15-31.

Goddard, J., Hazelkorn, E., & Vallance, P. (2016). *The civic university. The policy and leadership challenges*. Edward Elgar Publishing.

Goldman, E. (2006). Search engine bias and the demise of search engine utopianism. *Yale Journal of Law and Technology, 8*, 188-200.

Gorges, M. J. (2001). The new institutionalism and the study of the European Union: The case of the social dialogue, *West European Politics, 24*(4), 152-168.

Grillitsch, M. (2016). Institutions, smart specialization dynamics and policy. *Environment and Planning C: Government and Policy, 34*(1), 22-37.

Hogan, J. (2006). Remoulding the critical junctures approach. *Canadian Journal of Political Science/Revue Canadienne de Science Politique*, 39(3), 657-679.

Hogan, J. & Doyle, D. (2007). The importance of ideas. An a priori critical juncture framework. *Canadian Journal of Political Science/Canadienne de Science Politique, 40*(4), 883-910.

International Telecommunication Union (2015). *Internet Users per 100 Inhabitants 1997 to 2007.* < http://www.itu.int/ITU-D/ict/statistics/ict/> accessed 26 Apr 2019.

Kuhlman, S. & Rip, A. (2018). Next-generation innovation policy and grand challenges. *Science and Public Policy, 45*(4), 448-454.

Mahoney, J. (2000). Path dependence in historical sociology. *Theory and Society, 29*(4), 507-548.

Mahoney, J. (2001). Path-dependent explanations of regime change: Central America in comparative perspective. *Studies in Comparative International Development, 36*(1), 111-141.

Martin, R. and Sunley, P. (2007). Complexity thinking and evolutionary economic geography. *Journal of Economic Geography,* 7(5), 573-601.

Mazzucato, M. (2018). Mission-oriented innovation policies: challenges and opportunities. *Industrial and Corporate Change, 27*(5), 803-815.

Muhonen, R., Benneworth, P., & Olmos-Penuela, J. (2020). From productive interactions to impact pathways: Understanding the key dimensions in developing SSH research societal impact. *Research Evaluation, 29*(1), 34-47.

Nelson R. R. & Winter, S. G. (1982). *An Evolutionary Theory of Economic Change*. Harvard University Press.

Patel, P. & Pavitt, K. (1987). Is Western Europe losing the technological race? *Research Policy, 16*(2-4), 59-85.

Peters, B. Guy. (1999). *Institutional Theory in Political Science: The New Institutionalism*. Pinter.

Sharp, M. (1990). The single market and European policies for advanced technologies. In Crouch, C. and Marquand, D. (Eds.), *The Politics of 1992: Beyond the Single European Market*. Blackwell.

Siegel, D. S., Veugelers, R., & Wright, M. (2007). Technology transfer offices and commercialization of university intellectual property: performance and policy implications. *Oxford Review of Economic Policy, 23*(4), 640-660.

Uyarra, E. (Conceptualizing the regional roles of universities, implications and contradictions. *European Planning Studies, 18*(8), 1227-1246.

Uyarra, E., Flanagan, K., Magro, E., Wilson, J., & Sotarauta, M. (2017). Understanding regional innovation policy dynamics: Actors, agency and learning. *Environment and Planning C: Politics and Space, 35*(4), 559-568.

UNIVERSITIES' CONTRIBUTION TO CULTURE AND CREATIVITY-LED REGIONAL DEVELOPMENT: CONFLICTING INSTITUTIONAL DEMANDS AND HYBRID ORGANIZATIONAL RESPONSES

Abstract

Ridvan Cinar[a,b] and Lars Coenen[a]

[a]Mohn Centre for Innovation and Regional Development, Western Norway University of Applied Sciences, Bergen, Norway.

[b]Department of Social, Political and Territorial Sciences, University of Aveiro, Aveiro, Portugal.

Universities are increasingly recognized for playing a proactive role in supporting culture and creativity-led regional development. Meanwhile, they are also expected to distinguish themselves in their core activities via mission differentiation. Often these two demands are pitched against each other while little attention has been paid to the way universities can manage them. Drawing on 29 semi-structured interviews carried out with key actors, this article examines the way a public university located in a peripheral region in the Netherlands navigated such a complex institutional environment. The findings suggest that the university formulated a hybrid response strategy, engaging in both institutional demands simultaneously while prioritizing collaboration with cultural and creative industries and talent attraction over other sub-demands. More importantly, we demonstrate that organizational identity, which itself is influenced by peripheral characteristics as well as other institutional factors, plays a significant role in formulation of a hybrid response strategy. We therefore argue that universities' contribution to culture and creativity-led regional development is not only dependent on their resource capacity – as often suggested in the literature - but also how they envision their organizational identity, that is, the type of institutional profiling they want to pursue.

Keywords: culture and creativity; conflicting demands; mission differentiation; peripheral region; institutional complexity; organizational identity.

1- Introduction

Culture and creativity have recently become increasingly influential tenets of regional economic development strategies and sources of innovation (Markusen and Gadwa, 2010). The notion that culture and creativity can be utilized as an instrument through which economic growth can be spurred and societal challenges can be addressed has rapidly resonated with policymakers and urban planners. Over the past decades, various regional development models incorporating culture and creativity has emerged: culture for tourism promotion, culture for urban regeneration, cultural and creative industries (CCI), culture for attracting talent namely the *creative class* and culture for well-being of local residents (Sacco, Ferilli and Blessi, 2014). Although these models are based on two different yet interrelated concepts of culture and creativity, they have been used interchangeably (Throsby, 2010). In order to accommodate all these different models under one framework; we refer them as culture-led regional development (CRD) hereafter. In tandem with these emerging models, demands on universities to contribute into CRD have likewise become diversified. Universities, especially those located in peripheral regions, are now expected not only to embed culture and creativity in their regional contribution agenda but also play a role in all these models.

The literature on the nexus of universities and CRD has largely focused on their contribution to cultural and creative industries (e.g. Powell, 2007) and mainly on linkages with their host cities through creative graduates (e.g. Comunian and Faggian, 2011). Another (indirect) commonly found contribution is talent attraction (e.g. Cadorin et al., 2017). However, universities are organizations that possess a broad spectrum of knowledge capacity that can and has already been mobilized for the

remaining CRD models as well (Cross and Pickering, 2008). While they have the ability to assume a proactive role in supporting all models simultaneously, the resource constraints they face and internal organizational dynamics might influence them to make strategic decisions and be selective.

Universities are based in complex institutional environments in which they are held accountable to multiple demands such as mission differentiation (Van Vught, 2008). In addition to playing an active role in the regional development of their localities, they are also required to differentiate their organizational identity and programs from their peers nationally and internationally. Enders and de Boer (2009: 160) argue that such proliferation of demands have resulted in 'mission stretch' whereby universities are increasingly expected to act on multiple domains. Such a situation, characterized as institutional complexity entailing conflicting demands, can be difficult to navigate (Greenwood et al., 2011). The conflict relates to the long-standing dilemma whether a university should aim to be world-class or regionally relevant, two options that might require fundamentally different organizational arrangements. In this respect, how such universities- particularly those in peripheral regions- decide on which CRD models to support and what kind of organizational responses they formulate to meet various demands has so far been little understood. In this paper, we aim to contribute to these debates. Therefore, we ask the following research question: *when facing conflicting institutional demands of contribution into culture and creativity-led regional development and mission differentiation, what type of organizational responses do universities located in peripheral regions formulate? We first present characteristics of CRD models and peripheries, and reflect on different missions of universities. We then* mobilize a literature on conflicting institutional demands to highlight the factors affecting the way organizations navigate complex institutional environments.

Following that, we present a case study of a public research university in the Netherlands, which is located in a peripheral region and has recently undergone such a process. Our analysis demonstrates that internal dynamics and external place-specific factors make it difficult and risky for the university to ignore satisfying any of the demands which in turn lead to formulation of a hybrid response strategy to engage – at least partially - both in contributing to CRD and mission differentiation simultaneously. We conclude by arguing that contribution of universities in peripheries into CRD is not only dependent on their resource capacity (i.e. relevant human capital and physical infrastructure) but also how they envision their organizational identity, that is, the type of institutional profiling they want to pursue.

2. CRD Models, Peripheries and Universities

2.1. Type of CRD Models

One of the original CRD models dating back as early as 1960s is culture for tourism promotion (Scott, 2004). While not framed under the cultural economy concept back then, exploiting cultural potential of cities to attract tourists into areas that were stagnating was seen as a promising strategy (Richards, 1996). In this model, commonly referred as cultural tourism, the aim is to attract both domestic and foreign tourists that are interested in lifestyle, arts, cuisine and cultural heritage of local residents (OECD, 2009).

From 1980s and onwards, another model has started to gain traction, namely culture for urban regeneration (Graham, Ashworth and Tunbridge, 2000). Strategies rooted in this model aim to transform, usually, one neighborhood of an urban area into artistic and cultural center to attract foreign investment and a variety of corporations, and to a

lesser extent, tourists (Scott, 2004). This has been pursued mostly through big investments in physical infrastructure of cultural and artistic scenery.

In early 1990s, a shift of focus on CRD strategies commenced. This shift turned attention from place branding to local tangible and intangible products, namely cultural and creative industries. Scott (2004: 465) characterizes it as a new model "directed less to the selling of places in the narrow sense than to the physical export of local cultural products to markets all over the world". Cultural and creative industries are defined as 'activities whose principal purpose is production or reproduction, promotion, distribution or commercialization of goods, services and activities of a cultural, artistic or heritage-related nature' (UNESCO, 2015: 11). They cover various sectors ranging from advertising and gaming to performing arts, film and architecture.

By early 2000s, Florida's (2002) concept of creative class appeared within CRD debates. In brief and rather simplified manner, the theory suggests that highly skilled individuals namely the creative class who engage in cultural and creative labor, prefer locations that provide them with the 3T; (high level of) technological development, (high concentration of) talent, and tolerance (towards all aspects of an individual's life) (Florida, 2002). The model implies that attracting the creative class is the underlying element for innovation, competitiveness and CRD. Despite the criticism directed towards its insufficient empirical evidence (Hoyman and Faricy, 2009) and lack of sociological basis to use the term 'class' to refer to a heterogeneous group of highly skilled individuals (Sacco, Ferilli and Blessi, 2014), creative class model has also rapidly permeated regional policy field including the peripheries (Petrov, 2007) .

One last model that has recently emerged as a reaction to the challenges brought by previous models is culture for wellbeing of local residents. The previous four CRD models have resulted in significant socioeconomic challenges ranging from gentrification and rent seeking behavior to overcrowded cities and pressure on public services (Sacco, Ferilli and Blessi, 2014). This has renewed the interest in culture for the benefit of citizens and put the focus on wellbeing of local residents themselves. Increasing active cultural participation of local residents is an important aim of this particular model. The underlying logic is that an increase in cultural participation can result in an increase in individuals' wellbeing, skills and creativity, which then transform these individuals from being simply cultural consumers to be cultural producers as well (Sacco, Ferilli and Blessi, 2014).

2.2. Characteristics of Peripheries and Different Missions of Universities

Studies delving into the CRD have traditionally focused on core regions and cities over the past decades (e.g., Bayliss, 2007; Cox and O'Brien, 2012). Nevertheless, there has recently been a gradually growing body of work exploring CRD within peripheral regions demonstrating that CRD can lead to path creation in such regions (Petrov, 2007), but this is a complex process largely influenced by place-specific factors such as interaction between individual and organizational actors (Comunian, 2011). An efficient coordination between different organizations working towards a common vision, which has recently been framed under the term place leadership, therefore becomes a catalyst in driving regional development within these areas (Sotarauta, Kulihka and Kolehmainen, 2021).

Although peripheral regions have lately received more attention within the innovation and regional development literature in general, there is still not a consensus on what the term "periphery" refers to. Eder's (2019: 131) literature review revealed that the term has been associated with a number of weaknesses such as lack of economic activity and human capital, and low innovation rate. Others have argued against the deficit framing that still dominates the debate and identify advantageous aspects to peripherality for innovation and creativity (Grabher, 2018). Nevertheless, it is because of aforementioned weaknesses of peripheries that universities are expected to play a more proactive role in such regions to contribute into innovation and regional development. Likewise, due to these characteristics, policymakers have increasingly started to perceive CRD as a means by which such regions can be economically and socially revived.

Universities are able to play a significant role in all of the five CRD models: hosting museums and/or collaborating with them, mobilizing their resources to guide urban regeneration projects, collaborating with firms in cultural and creative industries, attracting and retaining talent through their science parks and incubators, and developing solutions to societal challenges such as aging and climate change by incorporating cultural elements and creativity. Nevertheless, it is likely that they would find playing all these roles simultaneously quite difficult due to resource constraints and different university missions.

Although their two main missions were teaching and research respectively, universities have, since early 1980s, been conceptualized as important actors contributing to innovation process, which later was termed as third mission (Laredo, 2007; Sormani et al., 2021). The third mission has experienced a heightened emphasis

due to the growing discourse on knowledge economy over the past two decades and universities have been expected to mobilize their resources for a variety of regional innovation activities (Arbo and Benneworth, 2007; Sjoo and Helström, 2019). Contribution to CRD has recently emerged as one such third mission activity. Whilst expectations on the third mission have become diverse and multiple, the demands on the first two missions, teaching and research, did not vanish. On the contrary, universities have also been expected to increase the quality of teaching and research simultaneously (Enders and de Boer, 2009) and position themselves distinctively in a competitive higher education landscape through mission differentiation (Van Vught, 2008). These multiple institutional demands within the realms of the first, second and third mission may conflict. This seem to indicate a prima-facie case that universities may face a two-layered organizational conundrum: how to respond to institutional demands of contribution to CRD and mission differentiation and in particular, which CRD models to prioritize. Insights from institutional theory on conflicting institutional demands can help us delve into this process.

3. Sources and Process of Conflicting Institutional Demands

Institutional demands from multiple actors may exert incompatible templates on organizational arrangements. Oliver (1991) argues that when neither of the demands can be neglected, organizations follow a *compromise* strategy whereby they try to satisfy all demands at least partially. Pache and Santos (2010) propose the following dimensions to better understand sources and processes of conflicting institutional demands: a) *type of field* (fragmented vs. unified), b) *the degree of centralization* (highly centralized, moderately centralized, decentralized), c) *nature of demands* (goal level vs. means level), and d) *internal representation* (group dynamics). They

argue that conflicting institutional demands are more likely to arise in fields that are *fragmented*. Fragmentation here refers to existence of multiple actors in a field, their respective logics and their activities that are not necessarily concerted (Meyer, Scott and Strang, 1987). Some fields entailing organizations that depend on and are accountable to multiple actors in decision-making are highly fragmented while other fields in which organizations rely on only few constituents in shaping their activities, are unified (Pache and Santos, 2010).

Pache and Santos (2010: 457) further argues that centralization 'characterizes a field's power structure and accounts for the presence of dominant actors at the field level that support and enforce prevailing logics'. These powerful actors can exert influence on organizations through resource-dependent relationships and by reinforcing/questioning their legitimacy. They range from regulatory authorities (Holm, 1995), to funding providers (Ruef and Scott, 1998) and more. Highly centralized fields usually entail one central actor whose authority is formally, socially and culturally recognized by other organizations in the field (Meyer, Scott and Strang, 1987). Such actors have the necessary attributes to resolve disagreements between other organizations and exert relatively coherent demands (Pache and Santos, 2010). On the contrary, decentralized fields lack dominant actors that can resolve tensions, the pressure on demands are weak and institutional prescriptions can be challenged or ignored as the source of the demands have little authority to enforce them (Pache and Santos, 2010). In between lies the moderately centralized fields that are the most institutionally complex due to the '…competing influence of multiple and misaligned players whose influence is not dominant yet is potent enough to be imposed on organisations' (Pache and Santos, 2010: 458).

Intensity of conflicting institutional demands experienced by organizations also depends on their nature. More precisely, the conflict can be experienced by organizations at the goal level; exerting influence on what goals an organization should pursue or at the means level- determining the kind of organizational arrangements needed to meet the demands (Oliver, 1991). Goal-level conflicts increase the intensity of tensions whereas means-level conflicts tend to be more open to negotiation (Pache and Santos, 2010).

Lastly, the way organizations respond to conflicting demands are also affected by the internal representation of these demands (Pache and Santos, 2010). Internal representation depends on whether organizational members have been socialized into a logic mirroring any of the demands (Friedland and Alford, 1991) and 'the extent to which the different sides of the conflict are represented internally' (Pache and Santos, 2010: 461). When conflicting institutional demands are only externally represented and do not necessarily find resonance among members, organizations display a reluctant and disinterested commitment (Greenwood and Hinings, 1996). When only one of the conflicting demands is internally represented, organizational members explicitly adhere to one side of the conflict and defend it (Pache and Santos, 2010). In situations where both conflicting demands are internally represented, member groups compete with each other and mobilize resources to assure that their organization responds to the demands the way they favor (Greenwood and Hinings, 1996).

3. Introduction to the Case Study and Methods

We utilize this framework to address the research question and then adopt qualitative exploratory approach using single case study to elaborate on a circumstance of

conflicting institutional demands surrounding a public university located in a peripheral region. In particular, we explore how a public university responded to conflicting demands of contribution into CRD and mission differentiation. For a variety of reasons that we detail in the following paragraph, we selected University of Twente (UT) in the Netherlands to do this.

UT is one of the four public technical universities in the Netherlands. It was found in 1961 and is located in Twente Region, eastern part of the country bordering Germany. The region has approximately 630.000 inhabitants with Enschede being the major city where UT is located. Compared to innovation heartlands of the Netherlands, particularly the Randstad conurbation including major central and western cities, Twente is characterized as a peripheral region within Dutch context (Benneworth and Pinheiro 2017). Until 1960s, textile sector dominated the industrial structure, then accounting for a significant of jobs in the region. With the gradual decline of the textile industry, the region structured its economic activities around ICT and services over the past decades. Regional and national authorities aim to provide further diversification via cultural and creative economy.

Since its establishment, the university has had a close relationship with the region, frequently interacting with the industry and other regional stakeholders. Similar to many regions across the world, culture and creativity discourse in innovation and regional development has started to prevail here as well, partly due to national and regional aspirations. Universities are expected to assume a proactive role in realizing these aspirations. Meanwhile, Dutch higher education policy has likewise been quite dynamic particularly since 2010, casting several demands upon universities, one of which is to differentiate its mission. UT has recently been under immense pressure

economically, socially and politically to satisfy both demands, which makes it a highly relevant and suitable case to delve into.

We did two field-works, conducting 29 semi-structured interviews with rectors (2), academic staff (14), administrative staff and executive board members (5), regional policymakers (4) science park employees (2), and personnel engaging with cultural affairs (2) between early 2018 and late 2019. The interviewees were selected after a desktop search of academic and professional expertise of employees (cultural and creative economy, cultural studies, creative cities and higher education studies), followed by a snowball sampling. The interviews lasted between 35 to 80 minutes; they were anonymous. They entailed questions on how the university has interpreted demands of CRD and mission differentiation, how it has responded to these demands and the impact of regional and national actors on formulated responses. Later, the interviews were recorded, transcribed and analyzed with a content analysis approach. In addition, relevant documents such as strategic plan of the UT, website content as well as culture and creativity related national and regional policy documents were also analyzed in order to better understand the institutional environment.

4. Institutional Environment of UT and Emergence of Conflicting Demands

4.1. Actors within the Institutional Environment

UT is located in an institutional environment, which is composed of several organizational actors with varying degree of power and influence. These actors range from the Dutch government ministries (mainly Ministry of Education, Culture and Science and Ministry of Economic Affairs and Climate Policy) and regional

authorities (Overijssel Province and Regio Twente) to firms, municipalities and broader societal groups (i.e. non-governmental organizations) They have had several regional development related expectations from UT. One such expectation lies within the realm of culture and creativity-driven regional contribution. Furthermore, the city of Enschede also hosts two other higher education institutions, namely Saxion University of Applied Sciences and ArteZ University of the Arts with which UT occasionally collaborates.

4.2. Emergence of CRD-related Demands

In 2011, the Dutch government designated cultural and creative industries (CCI) as one of the top nine sectors in its national enterprise policy, providing further funding for innovation and regional development related initiatives for CCI and placed paramount importance on the role of knowledge institutes in supporting them (MEAII, 2011). Since then, the discourse on culture and creativity-led innovation and regional development has grown at the national level and new organizational units were formed (e.g., Dutch Creative Council in 2012). The expectations from universities to play a proactive role in fostering creative industries within their geographic vicinities have increasingly been articulated:

> In order to exploit the power of the creative industry to our advantage, we need to get the education sector, knowledge institutions and the authorities working with the creative sector….The aim is for that sector to turn the Netherlands into the most creative economy of Europe by 2020. (MECS, 2016: 30).

Nevertheless, the political discourse on the role of culture in innovation and regional development has already gone beyond CCIs. In 2013, the policy memorandum titled *Culture Moves: The Meaning of Culture in a Changing Society* has started a debate on the meaning and value of culture for the Dutch territories (MECS, 2013). Driven by

the motivation to mobilize culture to tackle complex societal challenges, the scope of Dutch cultural policy has been widened to encompass social and artistic value in addition to economic one. Following these debates, the Dutch government set 6 priority areas within the cultural policy to find a balance between the artistic, social and economic spheres: a) *cultural education and participation in cultural life*, b) *talent development*, c) *the creative industries*, d) *digitization*, e) *entrepreneurship*, f) *internationalization, regionalization and urbanization* (MECS, 2016: 29). In parallel with national cultural policy, there has been a similar dynamism at the regional and local level as well. To illustrate, the Enschede municipality has drafted a vision to profile the city as a "*technological, innovative and creative city"*. (Enschede Municipality, 2020). The policy documents and interviewees suggest that there is a strong interest to 'push universities to align with these expectations to realize national, regional and local aspirations'.

4.3. Emergence of Mission Differentiation-related Demands

The foundations of another institutional demand, mission differentiation, have been laid down during the 2010s by the Veerman Committee. In their analysis of the Dutch higher education system, the committee concluded that the profile of universities is too similar and made the following recommendations: a) multi-level differentiation in degree programs, university profiles, and overall structure of the higher education system, b) greater specialization in teaching and research, c) increase in quality of education and research, and d) greater focus on talent generation and attraction at both national and international level (Veerman Committee, 2010). Based on this differentiation policy, performance and mission-based funding agreements have been signed between universities and the ministry in December 2011. Through these agreements, universities agreed for a greater differentiation and stronger institutional

profiling (de Boer et al., 2015). As one interviewee stated, ‘mission differentiation and institutional profiling has been very important in determining university strategies’.

5. Characteristics of the Conflicting Institutional Demands and UT’s Organizational Responses

5.1. Higher Education as an Increasingly Fragmented and Moderately Centralized Field

Traditionally, the main stakeholders of universities were education and research related ministries, agencies as well as the broader public. Since early 1980s, universities have started to engage with industry, and focus on entrepreneurship, innovation, licenses, and start-ups, raising the number of relevant stakeholders. This has been the case for UT as well.

Starting through early 1980s, UT has pursued an entrepreneurial university profile. During this period, new actors such as firms, industrial groups, the science park emerged. The influence of these new stakeholders on UT has been significant, shaping the direction of its third mission activities. Since 2010, UT’s engagement with regional actors has also grown while entrepreneurship and innovation has continued to be a solid institutional profiling simultaneously. Likewise, regional actors have also started to articulate their expectations from UT and developed several partnerships. This has created a new wave of relevant stakeholders in addition to the industry: the municipalities, regional development agencies, provincial government, regional cooperatives, associations and non-governmental organizations. Currently, the primary actors that influences UT are Ministry of Education, Culture and Science,

Ministry of Economic Affairs and Climate Policy, Overijssel Province, Regio Twente, Enschede municipality, the Kennispark (science and technology park), regional industry and citizens. As argued by an interviewee, 'there is no full coordination among these actors' and their expectations as well as priorities differ significantly, which designates the field UT is part of - higher education - as fragmented.

The actors have varying relationships with UT based on political, social and economic basis. Ministries provide policy objectives for directionality and extra public funding in return for pursuing and achieving these objectives. They further stipulate the rules, settled mutually in performance-based agreements, to receive such extra funding. Therefore, the power of these actors and basis of their relationship with UT are primarily political and economic. Industry is the source of significant amount of external income UT is increasingly expected to generate. The influence of the industry on UT is strong and the character of the relationship is mainly economic. Regional actors such as the provincial government, the municipalities, and regional development agency has less economic resources to offer but their political power, though much less compared to ministries, and representative nature of their agency can be strong enough to occasionally mobilize dynamics within UT as expressed by several interview partners. They can question the regional relevance of UT in a rather peripheral location. Thus, the basis of such relationships are political, social and, to a lesser extent, economic. Lastly, other societal groups, such as non-governmental organizations, associations and citizens offer very limited economic resources but their power lies in the social realm: 'when they feel their interests are not represented within the university, they can question the legitimacy of the public status of the UT', which can also compel UT to take internal actions to reclaim its legitimacy and public

relevance. In this respect, such relationships are mainly based on social contracts. Overall, all these actors have some sort of power they can exert to influence UT but none of them is dominant force alone to mediate the complex relationships, which makes the field moderately centralized.

5.2. Nature of Demands: Means Level Pressures

As a public university, UT has traditionally engaged with the regional actors quite considerably to meet their expectations and co-shape regional development trajectory. One such recent example is its involvement in the Agenda Voor Twente, a multistakeholder consortium entailing relevant partners including UT to formulate public policies to shape the regional development trajectory of Twente. As such, contribution to CRD, an expectation that is fundamentally about assisting regional development, is not an unfamiliar demand at the meso level. Regional engagement is already ingrained in UT's organizational identity. We therefore, argue that the nature of this particular institutional demand lies at the means level.

Being a public university has required UT to develop economic and political ties with the different segments of the Dutch government. Institutional profiling related demands have occasionally emerged in the past in different forms and 'it is already UT's goal to differentiate itself within the higher education landscape both nationally and globally' as articulated by interviewees. In fact, 'the differentiation process is seen as part of re-constructing organizational identity'. In this sense, the recent mission differentiation related demands are not novel to UT either and their nature also lay at the means level. There is a difference in this case though: the scope of both demands is much broader which means that there are important negotiations to be made.

5.3. An Unbalanced Internal Representation of the Demands

Mission differentiation is a kind of institutional demand that interests many organizational members in UT. It is 'at the very core of constructing organizational identity process'. As such, this particular demand was largely represented internally within UT. The majority of the organizational members at the time seemed having been socialized into technology-oriented logic. In other words, their interests and professional comfort zones laid in UT adopting a technology-oriented institutional profiling. As a result, mission differentiation was largely represented and shaped by such organizational members.

Contribution to CRD, on the other hand, is a type of institutional demand that would primarily interest organizational members who have been socialized into cultural and creativity science oriented logic. Although such members exist in UT, they do not constitute a significant majority. UT does not have a department of culture, cultural studies related research center, departmental chair or degree program. Cultural and creativity science oriented members are mainly scattered within the departments of Communication Science, and Design, Production and Management. Their internal influence is limited. Even though some of them express discontent with the UT's growing technological institutional profiling, they do not necessarily engage in competing with the technology-oriented members. Interviewees laid out mainly two reasons for this: a) technology oriented members constitute a group which is too big to compete with b) cultural and creativity science oriented members have also developed socialization with regard to technological institutional profiling over the years, which gave them the ability to adapt to a changing organizational environment.

Ultimately, what we observe is an unbalanced internal representation of the two demands within UT with quite minimal to none competition between the groups.

5.4. Compromise as a Hybrid Organizational Response

Both of the institutional demands has permeated UT at a time when it already accommodated significant discussions on what its organizational identity is and the kind of vision it should adopt. The technology-oriented actors in the field have perceived the mission differentiation as an institutional demand that grants legitimacy to their future vision of UT and as an opportunity through which this vision can be manifested. The basis of this vision was that UT should embrace its roots- that is, 'situating itself as a research-intensive technical university with digital technologies at the core of organizational identity'. The fact that this particular demand emerged out of the Dutch government and was even further formalized through performance agreements facilitated their cause. However, the scope of mission differentiation was quite broad. As such, it was clear that despite the great mobilization of organizational dynamics, some subordinate demands within mission differentiation might still not be fully met. A compromise thus emerged as a natural strategy. As a response, UT has defined itself as a research-intensive technical university with technology at the core of its identity as branded in its Vision 2030: 'We are a university of technology'(UT 2020, 9). While UT has been able to distinguish itself to a great extent globally and partly at the national level with this strategy, it is not clear how its institutional profiling differs from the other technical universities, namely Eindhoven University of Technology (TUe) and Delft University of Technology (TUDelft), within national context. To illustrate, psychology degree programs and research cluster in both UT and TUe focus on the same theme, namely psychology of human-technology interaction. Furthermore, we can find several commonalities within the research

clusters of UT and TUDelft (i.e. use of sensors and robots in health technology as a main theme within the medical sciences research cluster). In this regard, differentiation in university profile and degree programs has so far only partly been realized.

There are however contextual and regional factors, while allowing other technical universities to distinguish themselves, prevents UT to achieve full differentiation and develop a fully distinct identity. TuDelft is located in the city of Delft, part of the Rotterdam-Delft-The Hague metropolitan area. It receives significant investments from maritime and Dutch defense industry, and many multinational enterprises. Such an environment allows TUDelft to differentiate itself via such clusters among the technical universities. Likewise, TUe is located in the city of Eindhoven, which is part of Brabandstad metropolitan area involving such cities as Eindhoven and Tilburg. In particular the city-region, Eindhoven, entails a fruitful innovation ecosystem known as Brainport Eindhoven. It is one of the most innovative and economically dynamic regions of the country and is also known as the Dutch capital of design and creativity thanks to strong collaboration with industry giants such as Philips and hosting the annual Dutch Design Week, one of the biggest design events in Europe. This has also enabled TUe distinguish itself from TUDelft and UT along these lines. In comparison, UT is located in a rather institutionally thin environment, geographically remote to the economic heartlands of the country. The region's 'global connectedness is not equally developed and lacks a leading industrial sector'. This makes it rather difficult for UT to develop an organizational identity based on regional strengths and distinguish itself.

As for increasing the quality of teaching and research, UT's efforts lie in keeping the student numbers around ten to twelve thousand to maintain student/academic ratio, and increasing the number of international students and academic staff. In addition, UT has recently introduced a new teaching model titled as *Twente Education Model*, which divides a bachelor degree into 12 thematic modules (15 credits each) to increase interdisciplinarity and mobilize this presumably newly synthesized student knowledge to help tackling regional complex societal challenges (UT 2020).

Investing in talent is another subordinate demand of mission differentiation to which UT has tried to address. However, there seems to be a discrepancy of volume between efforts within this theme. More specifically, UT's efforts in this area largely focus on talent attraction rather than talent generation/retention. By hiring international academic staff and recruiting international students in its degree programs, UT argues that it is already bringing new knowledge to the region. The main institutional-wide strategy to keep the talent within the region or invest in it is to encourage students and academics to establish new firms with the support of its affiliated science park, Kennispark Twente and securing limited internship positions within the industry. In this respect, we observe a rather restrictive commercial-academic conceptualization of what talent is. An overview of mission differentiation related subordinate demands and the extent of responses by UT is provided in the table below.

Table 1

Mission differentiation related subordinate demands and the extent of organizational responses

Subordinate demands	**To what extent has it been met by UT?**
Differentiating university profile	Partly
Differentiating degree programs and research themes	Partly
Increasing quality of teaching and research	Largely
Investing in talent attraction	Largely
Investing in talent generation and retention	Minimal

UT's response to the demand of contribution into CRD mirrors similar organizational strategy. There are some subordinate demands upon which more emphasis has been placed while some others have received less attention. Mobilizing culture for tourism promotion for instance has not caused development of an institutional wide strategy. The response to this particular demand is highly dependent on individual academic initiatives. One example to this is the collaboration between some academic staff and a local museum on how to increase the number of both domestic and international tourists. Although the museum expected the collaboration take place in many areas, the contribution from the academic staff 'was reduced to automated text recognition to produce transcripts of archive files', which demonstrates that the contribution is characterized by its relevance to the UT's organizational identity. Similarly, contributions to culture-led urban regeneration processes materialize when such processes accommodate transition to smart city and/or smart region topics. Moreover, there seems to be an assumption within UT as pointed out by an academic that 'it is Saxion University of Applied Sciences and ArteZ that should contribute into cultural tourism and culture and art driven urban regeneration in the region'.

Collaboration with cultural and creative industries and attracting the creative class are two subordinate demands that have received the most attention. There are two reasons for this as expressed by many interviewees: a) collaboration with cultural and creative industries fits very well with the entrepreneurial spirit ingrained in the organizational identity since early 1980s, b) attracting the creative class overlaps with the talent demands of mission differentiation. There is a wide array of institutional support mechanisms established to encourage academics and students to contribute into these

two areas. Kennispark provides the needed support to form linkages with firms in the creative and cultural industry and for the establishment of start-ups/spin-offs within this sector. In addition, UT seems to have a strategy to attract the creative class (talent) to the region by recruiting international students including in design related degree programs at different levels.

The support to mobilize culture for wellbeing of residents also lacks institutional wide strategy but there is a growing dynamism in this area. UT has increased the number of cultural and art events that are also open to public. In addition, at the time of writing, it was making preparations to move some of these events and other related activities to the city center so that it is more accessible to the public. In sum, we observe a similar compromise strategy to prioritize some subordinate demands over others and shape the expected organizational response around it. An overview of contribution into CRD related subordinate demands and the extent of responses by UT are provided in the table below.

Table 2

Culture-led regional contribution related subordinate demands and the extent of organizational responses

Subordinate demands	**To what extent has it been met by UT?**
Mobilizing culture for tourism promotion	Minimal
Contributing to culture-led urban regeneration	Minimal
Collaborating with cultural and creative industries	Largely
Attracting the creative class	Largely
Utilizing culture for well-being of residents	Partly

6. Discussion and Conclusion

In this paper, we explored how a public university located in a peripheral region responded to conflicting demands of contribution into CRD and mission differentiation. Our study revealed when neither of the demands could be ignored, the

university engaged in a hybrid response strategy to satisfy subordinate elements of both institutional demands with a varying degree of organizational support. Organizational identity played an important role in formulation of a hybrid response strategy, thereby concurring with previous studies that highlighted its significance in navigating complex institutional environments (e.g., Kodeih and Greenwood, 2014). However, different to these studies, we further demonstrate that organizational identity and responses to CRD pressures are influenced by place as well as broader institutional environment. In particular, we observe three factors at play: i) peripheral character of the region and national higher education landscape, ii) lack of place leadership and iii) interpretive flexibility and use of culture and creativity.

The first issue relates to the peripherality of Twente region compared to other relatively more affluent parts of the Netherlands and the composition of Dutch higher education landscape. In order to catch up with more successful regions of the country, the regional authorities and other actors have resorted to two particular drivers of regional development; technology and creativity/culture. This has substantially influenced UT, leading to a strong emphasis on technological core of organizational identity and a prioritization of creativity over culture due to this technological feature. Both the region and UT monitor developments in other places and universities with a similar profile in order to strengthen links with them. Interestingly, this monitoring is not geared towards implementing one-size-fits-all type regional development strategies that have been quite common in peripheral regions over the past decades (Todtling and Trippl, 2005), but rather is an attempt by the region and UT to position themselves closely with the other two regions and universities possessing (perceived) similar characteristics while achieving a distinctive identity from the rest

simultaneously. In terms of higher education, this is illustrated by UT becoming a member of 4TU- a federation of Dutch technical universities aiming to increase collaboration among them. These developments suggest that regional actors and organizations, despite being in a periphery and absence of concerted efforts regarding CRD, are still able to exert influence on the organizational identity of a public university.

Secondly, and on a related note, while regional actors and organizations has established a vision regarding CRD, neither of them has so far mobilized their agency to coordinate the related activities. There is an absence of place leadership, under which such an agency is mobilized to ensure concerted efforts and avoid fragmentation between different actors (Sotarauta, 2018). This is exemplified by UT's perception of distribution of roles among other universities in the region. There is an assumption that Saxion University of Applied Sciences and ArteZ, are mainly responsible for meeting cultural tourism and culture-led urban regeneration sub-demands, however, there has not been a meeting/platform in which such a distribution of roles were decided and communicated. This is an outcome of what Sotarauta (2018: 195) characterize as "mobilization trap", albeit in a different form: regional actors may establish a common vision and each might still work towards contributing into it and yet none of them might show strong interest to take action in coordinating and monitoring the related efforts.

Thirdly, the prioritization of creativity dimension over culture stems also from a proliferation of sub-demands, which have become too many to meet simultaneously, within CRD over the past decades. This relates to a global trend, namely the

broadening scope of cultural policy in which culture and creativity has been used interchangeably with interpretive flexibility (Throsby, 2010). This provides legitimacy for regional actors and organizations in prioritizing some sub-demands such as creativity over culture, and yet enables arguing that they are working towards culture-led regional development. We thus contend that greater nuance is needed in formulation of CRD policy objectives as well as specific expectations from each regional actor if these actors including universities are expected to contribute into both culture and creativity.

Lastly, our research is an intensive single case study of a technical and research university located in a peripheral region in Europe. There might be other factors influencing universities' contribution into CRD in comprehensive universities as well as higher education institutions located in core regions or other parts of the world. CRD related expectations, for instance, might have to be situated against other potential conflicting demands upon universities. While the factors at play in other contexts and geographies might be different, the main implications in applying our findings into other universities are context sensitivity and organizational identity. We therefore conclude by arguing that future studies should pay greater attention into these two particular dimensions in order to better understand the way universities respond to the demand of contributing into culture and creativity-led regional development.

REFERENCES

Arbo P and Benneworth P (2007) Understanding the regional contribution of higher education institutions: a literature review. Paris, OECD.

Bayliss D (2007) The rise of the creative city: culture and creativity in Copenhagen. *European Planning Studies* 15(7): 889-903.

Benneworth, P and Pinheiro R (2017) Involving universities in regional upgrading in the periphery: lessons from Northern Europe. In: Fonseca M and Fratesi U (eds) *Regional Upgrading in Southern Europe*. Dordrecht: Springer, pp. 299-321.

Cadorin E, Johansson SG and Klofsten M (2017) Future developments for science parks: attracting and developing talent. *Industry and Higher Education* 31(3): 156-67.

Comunian R and Faggian A (2011) Higher education and the creative city. In: Anderson DE, Anderson AE and Mellander C (eds) *Handbook on Cities and Creativity*. Cheltenham: Edward Elgar, pp. 187-210.

Comunian R (2011) Rethinking the creative city: The role of complexity, networks and interactions in the urban creative economy. *Urban Studies* 48(6): 1157-1179.

Cox T and O'Brien D (2012) The 'scouse wedding' and other myths: reflections on the evolution of a 'Liverpool Model' for culture-led urban regeneration. *Cultural Trends* 21(2): 93-101.

Cross E and Pickering H (2008) The contribution of higher education to regional cultural development in the North East of England. Paris, OECD.

De Boer H, Jongbloed B, Benneworth P, Cremonini L, Kolster R, Kottman A, Lemmens-Krug K, and Vossensteyn H (2015) Performance-based funding and performance agreements in fourteen higher education systems. Report for the Ministry of Education, Culture and Science, 13 January. https://research.utwente.nl/en/publications/performance-based-funding-and-performance-agreements-in-fourteen-

Eder J (2019) Innovation in the periphery: A critical survey and research agenda. *International Regional Science Review* 42(2): 119-46.

Enders J and De Boer H (2009). The mission impossible of the European University: Institutional confusion and institutional diversity. In Amaral A, Neave G,

Musselin C and Maassen P (eds) *European Integration and the Governance of Higher Education and Research.* Dordrecht: Springer, pp. 159-178.

Enschede Municipality (2020) Technologie, innovatie, en creativiteit centraal in geactualiseerde, citymarketingvisie Enschede. Available at: www.enschede.nl/nieuws/technologie-innovatie-en-creativiteit-centraal-in-geactualiseerde-citymarketingvisie-0 (accessed 19 January 2021).

Florida, R (2002) *The rise of the creative class.* New York: Basic Books.

Friedland R and Alford RR (1991) Bringing society back in: symbols, practices and institutional contradictions. In: Powell WW and DiMaggio PJ (eds) *The New Institutionalism in Organizational Analysis.* Chicago: University of Chicago Press, 232-263.

Grabher G (2018) Marginality as strategy: leveraging peripherality for creativity. *Environment and Planning A: Economy and Space* 50(8): 1785-1794.

Graham B, Ashworth G and Tunbridge J (2000) *A geography of heritage: Power, culture and economy*. London: Arnold Publishers.

Greenwood R and Hinings CR (1996) Understanding radical organizational change: Bringing together the old and the new Institutionalism. *Academy of Management Review* 21(4): 1022-1054.

Greenwood R, Raynard M, Kodeih F, Micelotta EF, and Lounsbury M (2011) Institutional complexity and organizational responses. *Academy of Management Annals* 5(1): 317-371.

Holm P (1995) The dynamics of institutionalization: transformation process in Norwegian fisheries. *Administrative Science Quarterly* 40(3): 398-422.

Hoyman M and Faricy C (2009) It takes a village: A test of the creative class, social capital and human capital theories. *Urban Affairs Review* 44(3): 311-333.

Kodeih F and Greenwood R (2014) Responding to institutional complexity: The role of identity. *Organization Studies* 35(1): 7-39.

Laredo P (2007) Revisiting the third mission of universities: toward a renewed categorization of university activities? *Higher Education Policy* 20(4): 441-456.

Markusen A and Gadwa A (2010) Arts and culture in urban or regional planning: A review and research agenda. *Journal of Planning Education and Research* 29(3): 379-391.

Meyer J, Scott WR and Strang D (1987) Centralization, fragmentation and school district complexity. *Administrative Science Quarterly 32*(2): 186-201.

Ministry of Economic Affairs, Agriculture and Innovation (2011) To the top: towards a new enterprise policy. Available at: https://www.government.nl/documents/parliamentary-documents/2011/02/04/to-the-top-towards-a-new-enterprise-policy (accessed at 4 February 2021).

Ministry of Education, Culture and Science (2013) Culture moves: The meaning of culture in a changing society. Letter by the Netherlands' Minister of Education, Culture and Science to the Lower House of the Parliament. The Hague.

Ministry of Education, Culture and Science (2016) Culture at a first glance. Available at: https://www.government.nl/documents/publications/2017/04/21/culture-at-a-first-glance (accessed at 21 April 2021).

Oliver C (1991) Strategic responses to institutional processes. *Academy of Management Review* 16(1): 145-179.

Organisation for Economic Cooperation and Development (2009). *The impact of culture on tourism*. Paris: OECD.

Pache AC and Santos F (2010) When worlds collide: The internal dynamics of organizational responses to conflicting institutional demands. *Academy of Management Review* 35(3): 455-476.

Petrov A (2007) A look beyond metropolis: exploring creative class in the Canadian periphery. *Canadian Journal of Regional Science/Revue Canadienne des Sciences Régionales* 30(3): 451-74.

Powell J (2007) Creative universities and their creative city-regions. *Industry and Higher Education* 21(6): 323-335.

Richards G (1996) *Cultural tourism in Europe.* Wallingford: CBA International.

Ruef M and Scott WR (1998) A multidimensional model of organizational legitimacy: hospital survival in changing institutional environments. *Administrative Science Quarterly* 43(4): 877-904.

Sacco P, Guido F and Tavano B (2014) Understanding culture-led local development: A critique of alternative theoretical explanations. *Urban Studies* 51(13): 2806-2821.

Scott AJ (2004). Cultural-products industries and urban economic development: Prospects for growth and market contestation in global context. *Urban Affairs Review* 39(4): 461-490.

Sjoo K and Hellström, T (2019) University-industry collaboration: A literature review and synthesis. *Industry and Higher Education* 33(4): 275-285.

Sormani E, Baaken T and Van Der Sijde P (2021) What sparks academic engagement with society? A comparison of incentives appealing to motives. *Industry and Higher Education*, epub ahead of print.

Sotarauta M, Kurikka H and Kolehmainen J (2021) Patterns of place leadership: institutional change and path development in peripheral regions. In: Sotarauta M and Beer A (eds) *Handbook on City and Regional Leadership*, 203-225. Cheltenham: Edward Elgar, pp. 203-225.

Sotarauta, M (2018) Smart specialization and place leadership: Dreaming about shared visions, falling into policy traps? *Regional Studies Regional Science* 5(1): 190-203.

Throsby D (2010) *The economics of cultural policy*. Cambridge: Cambridge University Press.

Todtling F and Trippl M (2005) One size fits all? Towards a differentiated regional innovation policy approach. *Research Policy* 34(8): 1203-1219.

United Nations Educational, Scientific, and Cultural Organization (2015) Cultural Times: The First Global Map of Cultural and Creative Industries. Paris: UNESCO.

University of Twente. 2020. "Shaping 2030: Mission, vision and strategy." Accessed 22 July 2020. https://www.utwente.nl/en/organisation/about/shaping2030/documents/shaping2030-fulldocument.pdf

University of Twente (2020) Twente education model (TOM). What is TOM? Available at: https://www.utwente.nl/en/tom/whatistom/ (accessed at 22 January 2021).

Van Vught F (2008) Mission diversity and reputation in higher education. *Higher Education Policy* 6(1): 151-174.

Veerman Committee (2010) Threefold differentiation. For the sake of quality and diversity in higher education. Recommendations of the Committee on the future sustainability of the Dutch higher education system. The Hague: Ministry of Education, Culture and Science.

Received: 6 June 2019 | Revised: 22 January 2020 | Accepted: 27 January 2020

DOI: 10.1111/grow.12367

SPECIAL ISSUE

growth and change WILEY

Why do universities have little systemic impact with social innovation? An institutional logics perspective

Ridvan Cinar[1] | **Paul Benneworth**[2,3]

[1]Department of Social Political and Territorial Sciences, University of Aveiro, Aveiro, Portugal

[2]Department of Business Administration and Social Sciences, Western Norway University of Applied Sciences, Bergen, Norway

[3]Center for Higher Education Policy Studies, University of Twente, Enschede, the Netherlands

Correspondence
Ridvan Cinar, Department of Social Political and Territorial Sciences, University of Aveiro, Aveiro, Portugal.
Email: rcinar@ua.pt

Funding information
H2020 Marie Skłodowska-Curie Actions, Grant/Award Number: 722295

Abstract

Social innovation has been increasingly regarded as an instrument through which transformative structural change, necessary to address grand societal challenges can be achieved. Social innovations are encouraged by the emergence of innovation systems that support changes not exclusively driven by a techno-economic rationality. In the context of this special issue, there has been both little understanding of social innovation systems within mainstream innovation ecosystem approaches and little analysis of the roles played by universities in social innovation systems. We here focus on the institutional complexity of universities and their field-level dynamics as serving as a potential break on the institutionalisation of social innovation. To deepen our understanding of this, we utilise a literature around institutional logics to foreground characteristics of organisational fields with regard to social innovation. Drawing on empirical data gathered in two public universities located in different countries, we show that in one case the potential of social innovation is undermined by two dominant institutional logics, in the other its permeation across the organisational field is seriously challenged by a more powerful dominant logic. The institutional logic approach is useful to highlighting the barriers to building productive innovation ecosystems incorporating social considerations, and helps to explain the persistent difficulties in reframing ecosystems approaches to reflect wider societal dynamics.

1 | INTRODUCTION

Societies globally face pressing problems including climate change, income inequality, and demographic changes commonly referred as "grand challenges" and now subsumed within the United Nations Sustainable Development Goals (SDGs). These challenges are highly complex and solving them requires new collaborative approaches, organisational forms and perspectives to resource use (Ackoff, 1999). Solutions demand structural changes in societal systems at the level of organisations (related to products or markets) and regulatory frameworks (for processes and services). Social innovation is a recent approach to ensure new products, markets, processes, and services can drive structural change (Avelino et al., 2017; Mulgan, 2007). Academic and policy research has thus become increasingly interested in social innovation (Moulaert, Mehmood, MacCallum, & Leubolt, 2017). Policy makers, particularly in Europe, have made social innovation a central demand in their calls for universities to better contribute to society:

> *Universities are transformative spaces and have a particularly important role to play in social innovation development producing new knowledge or skills development in the disruptive social innovation domain…. Against a general commitment to social responsibility, proactive measures can be undertaken such as creation of Social Innovation Chairs, explicit rewarding of contributions to social innovation in academic promotion….*
>
> *(European Commission, 2018, p. 9)*

However, university engagement often focuses on creating new technologies (Göransson, 2017), partly because universities do not understand particularities of social innovation systems sufficiently. Universities may not distinguish different innovation mechanisms, and create policies (such as technology transfer offices) that prioritise technological innovation over social innovation. The assumption that social innovation systems are similar to regional innovation systems has increasingly been critiqued (Asheim & Isaksen, 1997; Barkley, Henry, & Nair, 2006; Kleverbeck, Mildenberger, Schröer & Terstriep, 2019). This paper contributes to these debates by creating a framework for understanding university engagement with social innovation systems in the context of increasing pressures to address societal challenges.

We consider social innovation system as an interesting manifestation of non-technological innovation systems. Fulgencio and Lefever (2016, p. 12) define it as "an inter-connection of things or actors in developing, diffusing and utilising innovation targeting social issues or needs … on an institutional, organizational or societal level." Universities could potentially be significant within social innovation systems, but the evidence suggests that they have not yet systematically engaged in supporting social innovation (McKelvey & Zaring, 2018). Howaldt, Kaletka, Schröder, Rehfeld, and Terstriep (2016) found that out of 1,005 social innovation cases, universities participated in just 15% and primarily as partner (rather than leader). Universities are not development agencies primarily mandated to support innovation systems, but rather organisations with knowledge potentially relevant to innovation activities (Arbo & Benneworth, 2007; Benneworth & Cunha, 2015; Perkman et al., 2013).

Given universities have mainly focused upon supporting technological innovation in recent decades, this paper explores the conditions under which universities may support social innovation. This is essential in this special issue's context to understand the full range of universities' contributions to innovation systems, incorporating both technological and social innovation dimensions. We draw on universities' property of being institutions comprised of very diverse knowledge communities held together by common norms, values and practices, stable over the long-term and resistant to short-term demands for change (Weick, 1976). We ask following research question: to what extent can we characterise universities' responses to external demands to support social innovation using existing

frameworks developed for technological innovation systems? We conceptualise this via organisational dynamics and institutional logics literatures (Thornton & Ocasio, 2008), highlighting the potential for clashes of institutional logics either encouraging or hindering (individual) embedded agency within institutions (Section 2). We present case studies of two public universities' involvement in social innovation (Section 3), identifying the two universities' dominant institutional logics (Section 4) and the institutional challenges for individual social innovators raised by putatively mismatching institutional logics (Sections 5 and 6). The analysis highlights two mechanisms by which institutional logics may constrain social innovation, firstly excluding social innovation as an acceptable institutional logic, and secondly damping the effects social innovation may achieve when mobilised as an institutional logic (Section 7). Section 8 reflects on the ways these "exclusion" and "damping" mechanisms constrain how universities may contribute to social innovation systems. We conclude by arguing that system approaches to innovation should "move outside of their comfort zone" to better differentiate social innovation systems from technological and regional innovation systems and thereby better capture university contributions in the round.

2 | SOCIAL INNOVATION'S PLACE IN HIGHER EDUCATION INSTITUTIONS: AN INSTITUTIONAL LOGIC PERSPECTIVE

2.1 | Social innovation as a response to grand challenges

Social innovation fits with Schumpeter's (1931) notion that innovation involves identifying both an unmet need and a change pathway to satisfy that need, with Schumpeterian entrepreneurs mobilising resources to make new combinations that deliver those changes. Although Schumpeter did not specify that innovations need exclusively be economic, since the 1970s, ideas of innovation and entrepreneurship have become increasingly restrictively defined, around technological innovation driven by commercial entrepreneurship (Benneworth & Cunha, 2015). Innovation systems arise when networks of users and producers become formalised to acquire systemic properties in particular territories (Asheim & Isaksen, 1997; Lundvall, 1988). Cooke (2005) characterised universities' roles within innovation systems as contributing to the knowledge production subsystem then used by the knowledge exploitation sub-system (firms). Universities have since the 1980s developed infrastructures and mechanisms to support these efforts (Popp Berman, 2012), and creating technology transfer offices helped to institutionalise university innovation system input around technological innovations (Benneworth & Cunha, 2015).

Social innovation emerged as a distinct academic and policy interest in the 1980s (Moulaert et al., 2017). The increasing visibility of societal challenges demanded multi-institutional and multi-actor solutions, which further increased the centrality of social innovation within innovation policy (Kuhlman & Rip, 2018). The European Commission responded quickly, accelerating research resources made available to study and expand social innovation research and practice since 2007 (Van der Have & Rubalcaba, 2016). Social innovations are "innovative activities and services … motivated by the goal of meeting a social need and … predominantly developed and diffused through organizations whose primary purposes are social" (Mulgan, 2007, p. 11). It is not easy to produce a singular definition of social innovation (Benneworth et al., 2015), but Caulier-Grice et al.'s (2012) typology is useful in clarifying the concept's main elements (see Table 1).

TABLE 1 Types and examples of social innovation

Types	Examples
New products	Assistive technologies developed for people with disabilities
New services	Mobile banking
New processes	Peer-to-peer collaboration and crowdsourcing
New markets	Fair trade or time banking
New platforms	New legal or regulatory frameworks or platforms for care
New organisational forms	Community interest companies
New business models	Social franchising, or just in-time models applied to social challenges

Source: Caulier-Grice et al. (2012).

2.2 | Universities' societal contributions

Universities contribute to societal development in various ways, reflecting different modes of internal organisation but also different visions of universities' roles and the place of societal contributions in these. Uyarra (2010) outlines five archetypes of university societal engagement; distinguishing knowledge factories (focused on technology knowledge for industry), relational universities (working interactively with industry), entrepreneurial universities (exploiting their knowledge via patents and spin-offs), systemic universities (building collective innovation assets) and engaged universities (improving regional policy frameworks). Each orientation allows social innovation a different institutional freedom; engaged and entrepreneurial university approaches are potentially supportive of social innovation (at least not indifferent to it), whilst the other models frame university knowledge in ways that potentially makes social innovation invisible. Uyarra's typology reflects institutional autonomy to determine regional mission, but this implies that universities' regional missions in turn are shaped by the role played by regional partners in their regional knowledge activities.

The regional innovation system literature is increasingly recognising the shortcomings of conceiving universities as knowledge producers for technological innovation. But an alternative critique is this notion that universities are centralised institutions within singular missions and goals, endowed with strategic actorhood, typically deployed by senior managers. Universities' regional roles are determined by these managers, which are then executed uncritically by their employees (Goddard & Vallance, 2013). This ignores the fact that universities' RIS agency typically comes through operational staff (Van den Broek, Benneworth, & Rutten, 2019) and does not always straightforwardly correspond with senior managers' strategic promises (Benneworth, Pinheiro, & Karlsen, 2017). Foregrounding university agency in RIS processes misframes the locus of university agency, and the importance of academic staff in determining universities' contributions (cf. Uyarra, Flanagan, Magro, Wilson, & Sotarauta, 2017).

A related problem is that social innovation is seldom a university's most urgent mission. Universities face intense pressure to improve teaching and research quality, to internationalise and create excellence, facing what Enders and de Boer (2009, p. 173) characterize as "mission overload." Different missions may interfere with each other. Universities' strategic choices reflect simply what is achievable given those pressures and restrictions. Universities are knowledge communities, creating societal contributions through their core teaching and research activities. Universities do have some strategic

autonomy to choose their own priorities, and Hazelkorn (2011) notes the roles played by rankings in shaping university missions and priorities. Rankings have singularly failed to capture universities social contributions thoroughly including the recent Times Higher Education's University Impact Rankings by SDGs (Greatrix, 2019).

2.3 | University strategic management, institutional logics and embedded agency

There suggests a clear prima facie case that universities might either strategically or operationally find social innovation not a "useful" activity, leading to its exclusion in practice as an institutional goal. Universities reflect diverse socio-economic and political environments. Even within one university, different forms of behaviour reflect disciplinary heterogeneity such as epistemological scientific traditions and external engagement (Pinheiro, Langa, & Pausits, 2015). Different units may seek to achieve very different overall goals (Thornton & Ocasio, 2008) reflecting material differences in the knowledge communities' knowledge practices (such as teaching, research, and public engagement) most relevant to these disciplines.

This significance of contradictory practices and different belief systems within institutions is addressed by Friedland and Alford's (1991) "institutional logics" approach. Institutional logics are "socially constructed, historical patterns of material practices, assumptions, values, beliefs and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their social reality" (Thornton & Ocasio, 1999, p. 804). An organisational field may be constructed by a dominant institutional logic (Scott, 2008; Thornton, Ocasio, & Lounsbury, 2012), but two or more institutional logics may also co-exist within a single institution for lengthy periods (Reay & Hinings, 2009). Reay and Hinings (2009, p. 646) posit that "when competing logics co-exist in an organisational field, actors guided by different logics may maintain strong separate identities and engage in collaborations that result in mutually desirable outcomes and thus sustain the co-existing logics." How these logics play out and interact strongly shapes institutional performance.

An institutional logic approach thus provides a possible means to understand the conditions under which universities might contribute to social innovation. Institutional logics perspective contends that individuals' values, norms, beliefs and interests are shaped by their wider institutional context, reflecting both individual intensions and decisions alongside what is possible within the institutional context (Friedland & Alford, 1991; Thornton & Ocasio, 2008). Institutional logics shape which individuals and organisations achieve status, prestige, and competitive advantage (Sewell, 1992), and those who are able to exercise initiative and achieve change, something termed as "embedded agency." Embedded agency reflects three elements. Individuals, organisations and institutions possess partial autonomy in their actions (Battilana, 2006; Friedland & Alford, 1991); individuals engage in contests and mediation, while organisations and institutions are fields of conflicts and contradictory practices (Thornton & Ocasio, 2008). All three are mutually interdependent, and this interplay both constrains and enables individual/organisational action; these interplays determine institutional outcomes and provide a lens for exploring universities' limited engagement with social innovation.

Universities have since the 1970s experienced demands to be more societally useful, driving mission differentiation and organisational branding as "entrepreneurial universities" or "innovative universities". Most recently, civic and socially oriented regional contributions have been added to these expectations (Goddard, Hazelkorn, & Vallance, 2016; Uyarra, 2010). Imposing social innovation missions onto universities represents imposing new expectations and goals onto institutions. But

universities have existing (deeply embedded) logics, in the case of external engagement often focused around economic and technological engagement. This risks turbulence between these different logics, disrupting and thwarting efforts to deliver social innovation. This suggests a heuristic for the weak uptake of social innovation, namely that deeply embedded techno-economic logics has exerted agency which hinders efforts to undertake social innovation. We propose three kinds of dominant beliefs that may correspond with that embedded agency, namely:

1. university engagement should exclusively relate to industry collaboration (Lendel & Qian, 2017; Motoyama & Mayer, 2017),
2. to professional and academic identities that regard social innovation negatively, as inferior or as a threat (Brundenius, Göransson, & Mello, 2017) or indeed,
3. a reliance upon commercial income generated by technological innovation and commercialisation activity (McKelvey & Zaring, 2018; Perkman et al., 2013).

This in turn prevents social innovation from building up its own institutional logic, leaving it fragmented and not sufficiently institutionalised rather than systematically embedded within universities.

3 | METHODOLOGY

To address the research question with this framework, we adopted an exploratory research design using multiple case studies. A case study methodology is premised upon emphasising a deeper understanding of context and allows exploring causation (Yin, 2003). We explore universities' engagement with social innovation to reveal challenges faced by individual academics, an under-researched topic in the literature despite the growing popularity of universities' societal contributions as a research theme (Benneworth & Fitjar, 2019). We selected universities in national systems where universities have a duty to make some kind of socio-economic contribution. We chose two universities that actively promoted themselves as being outwardly oriented, stimulating entrepreneurship and innovation and claiming to generate social innovations, but where social innovation was weakly institutionalised at the organisational level compared to technological innovation. They are both universities where societal engagement features as an important strategic institutional mission: the University of Twente (UT, the Netherlands) and the University of Aveiro (UA, Portugal). Both are relatively young, technical universities in declining industrial regions, facing strong regional stakeholder pressure to actively engage in regional development.

Our approach involved key actor interviews with university members (faculty, rectors, administrative personnel, and practitioners) who had either contributed to a social innovation initiative or had academic and practical expertise on social innovation and/or higher education research. Relevant informants were selected by a combination of criterion and snowball sampling, yielding in 36 semi-structured interviews (19 in UT and 17 in UA). Descriptive information regarding the interviews and informants is presented in the Table 2. The data were transcribed and coded inductively and analysed thematically (Fereday & Muir-Cochrane, 2006).

The analysis explores how institutional logics operated, and whether dominant institutional logics could exert embedded agency that restricted social innovation activities and creating a stable social innovation logic. We sought to identify potential obstacles hindering the emergence of social innovation around three mechanisms; (a) a belief in the importance of commercialisation, (b) professional identities being threatened by social innovation, and (c) economic models demanding rates of return that excluded social innovation activities. The case studies firstly set out the two institutions' dominant

TABLE 2 Descriptive information regarding interviews and informants

Universities	Interview period	Interview duration	Expertise	Gender information
University of Twente	First: 11/2017 Last: 04/2018	Minimum: 33 min Maximum: 76 min	12 Social innovation 7 Higher education	14 Male 5 Female
University of Aveiro	First: 05/2018 Last: 10/2018	Minimum: 42 min Maximum: 80 min	13 Social innovation 4 Higher education	6 Male 11 Female

institutional logics with regard to social innovation, and then explore how these three mechanisms affected social innovation's institutionalisation.

4 | THE DOMINANT INSTITUTIONAL LOGICS OF UT AND UA

4.1 | UT, "high technology" and "global excellence"

The Twente region, in the eastern Netherlands, is part of Overijsel Province, bordering Germany to the east with a population of some 630,000. Its dominant textile industry declined in the 1960s, leaving regional unemployment rate exceeding the national average. More recently challenges included: (a) a loss of population and relative loss of tax base and services, (b) arrival of Syrian refugees and their socio-economic integration, and (c) an ageing population. Regional residents already have a long tradition of self-organisation known locally as "noaberschap," derived from high levels of historical interdependence of village residents in this agriculturally infertile region, a kind of social innovation *avant-la-lettre*. Noaberschap manifested itself institutionally as a willingness by organisations to work constructively together to solve these regional problems.

The UT is a technical university located in Enschede, the Netherlands, founded in 1961. It was created to revive regional fortunes firstly by working with textiles, subsequently stimulating entrepreneurship, creating many high-technology start-up companies, profiling itself as the Netherlands' most entrepreneurial university (cf. Benneworth & Hospers, 2007), and more recently claiming that it is contributing to social development. From 2010, a distinct institutional logic emerged around the slogan "high tech, human touch" (HTHT), reflecting UT's two disciplinary cores, technology and social sciences. The HTHT slogan became institutionalised: proposed activities were required to be justified in terms of how they conformed with HTHT. But at the same time, the emphasis on high technology was much stronger than human touch requirement reflecting the relative dominance of technological over social sciences faculties. One manager noted: "It is very important for us to brand ourselves as 'high tech-human touch'. We consider this as something that differentiates us from others" (Administrative staff, 14).

Regional partners supported this high technology logic as part of their efforts to promote region's "high-tech" profile to attract new investment. Another UT administrator noted: "I think the high tech profile of this region is important. This region used to have a tech profile (textile) and production industry. It is still technical but transitioning to high-tech image and identity" (Administrative staff, 2).

A parallel logic emerged alongside HTHT, "global excellence," driven by the rise of rankings and increasing pressures for excellence in research funding regimes. The UT had a number of extremely expensive scientific infrastructures (such as a nanotech laboratory) whose viability depended on global excellence. Employees were pressured to generate large-scale research grants to support those technological infrastructures, and this led to a hardening of the UT's attitude towards external engagement, one academic noting:

> *This university says it is innovative, says it contributes to the region which it does but it is less successful now as far as I see, than 20 years ago. The university now sees itself, in geographical sense, as an engine for development of larger area than only the region, with a global attitude, which is due to global competition.*
>
> *(Academic staff, 4)*

One academic described a situation where "we have so much pressure to publish and go up in the rankings that I cannot see how a university can do that without focusing on excellent research and turn global" (Academic staff, 15). The global excellence logic was particularly popular amongst the more technological disciplines such as nanotech with high potential to generate external funding, and where it easily elided with the HTHT logic.

UT did create a DesignLab to stimulate a design thinking form of social innovation, but the DesignLab infrastructure was so expensive that it became dependent on the presence of willing sponsors (such as municipalities, companies, foundations or the Province) to cover those costs. At the time of writing, it had become a site where technical research projects sought to drive acceptation of their inventions rather than sites of social innovation.

4.2 | UA, competing logics of "engineering" and "design"

The Aveiro region, in central-coastal Portugal, includes 11 municipalities with approximately 370.000 inhabitants. The region historically depended on agriculture, fisheries, forestry, and clay industries until the early 1970s: currently 60% of the economy comprises chemical, non-metallic minerals, agro-food, metallurgical, ceramics and advanced forestry sectors (Rodrigues & Teles, 2017). Aveiro's key regional challenges include population decline, particularly in rural areas, post-crisis austerity (particularly for public services) and demographic ageing. Aveiro's policy makers expect social innovation to address these challenges.

The University of Aveiro (UA) was established in 1973, a time of Portuguese higher education expansion. Since its creation, several roles have been casted mainly for sciences and engineering staff to contribute to the region via increased industrial collaboration, and tackling the long-contaminated Aveiro Lagoon's environmental problems (Dias, Lopes, & Dekeyser, 1999; Rodrigues & Teles, 2017). Science and engineering departments have always played significant roles in shaping UA's regional engagement. 9 of UA's 16 departments offer engineering degrees at bachelor, master or doctoral level, and many academic staff in non-engineering departments (including social, political & territorial sciences, and communication sciences) have an undergraduate or postgraduate education in engineering. These academic staff with an engineering background (admittedly a heterogeneous group due to sub-disciplines) has held many of UA's most senior management positions. The Rectory team at the time of writing (12 vice-rectors/pro-rectors in total) has 5 engineers, and one each from sciences, mathematics, educational sciences and psychology, accounting, and health sciences. UA has had 8 rectors and 6 had a background in sciences, 1 in humanities and 1 from the engineering.

UA's "engineering logic" mostly manifested itself in terms of UA understanding "societal contributions" as involving contract research, industrial collaboration, and student internships, kind of tasks many engineers feel to be appropriate to a university. This logic frames how UA has focused on more recent challenges. One academic interviewee noted: "We should be more active in [tackling the grand challenges]. We should put more effort on cooperating with firms and helping them to be competitive. Also arrange more internships for students and keep them here after graduation." (Academic staff, 7). Nevertheless, several engineers did articulate a desire to go beyond traditional commercialisation engagement (see Section 6).

The other logic originates with academic staff specialising in design and design thinking, primarily within UA's Department of Communication and Art (DECA). Their approach became visible within UA because of their claimed capacity to tackle societal challenges from 2007 and onwards. The 2008 financial crisis drove all Portuguese universities to reach out to civil society, creating an opportunity for DECA staff to introduce social innovation as a concept to UA via "design thinking" approaches. A majority of projects involved DECA staff members as leaders or partners, although several other departments did participate in social innovation.

Their design logic approach was characterised by particular set of beliefs and material practices that effectively tackling grand challenges requires designing a new structure, process, habit or state of mind that produce a systemic change. One senior academic noted:

> *We (academic staff in design department) think that social innovation has great potential to solve them (grand challenges). Most of them are about changing a structure, way of doing things, people's mind etc. … The starting point for all of these is design. That is why we think design should be at the heart of every social innovation project. (Academic staff, 4)*

DECA staff sought to push the design logic into UA's institutional environment, creating a research group (Design for Social Innovation and Sustainability) within the Research Institute for Design, Media and Culture, convincing the rectory team to appoint a designer to manage the Design Factory, and starting workshops on social innovation within the Design Factory. Some projects involved collaboration between engineers and designers on social innovation exemplified by a project developing furniture from cork waste products, whereby each discipline was able to follow their own approach to creating regional contributions, not challenging professional identities. Engineers could undertake traditional knowledge transfer activity, whilst designers collaborated to change UA's attitude towards the circular economy and design modules to raise students' awareness about the subject matter.

5 | THE INSTITUTIONAL SPACE FOR SOCIAL INNOVATION IN THE UNIVERSITY OF TWENTE

In Twente, the two dominant logics of high technology and global excellence appeared to undermine any social innovation activities that did not entail applying high technology solutions. An academic working on social innovation project on rural citizen empowerment inside the Netherlands and beyond noted:

> *We were working with farmers in rural areas and their business ideas were about agribusiness… There was another one (idea) to establish something like a consultancy firm but for local community organizations … for the university perspective, this is not very interesting. Because, well, … nothing is high tech at all. All the innovation related to social organization and how they organize business models in such a way that this business*

creates social and environmental value is not a topic that is relevant to the university. (Academic staff, 8)

This illustrates the multiple mechanisms by which the high technology logic restricted social innovation activities. Firstly, the team were repeatedly asked whether the social innovation initiative fitted with high technology, and when the team responded that they neither had nor needed a high technology dimension, their departmental head and several colleagues reminded them of the UT's "HTHT" organisational identity. The team took those comments to mean that despite the project's intrinsic merits, their project was not legitimate in terms of UT's desired culture. Another team member added:

They (head of departments and vice rectors) do not go as far as to forbid you engaging with the initiative. They just do not support you, stay neutral and leave you alone. What happens then is that you realize a single person or a couple of academics cannot initiate a social innovation without organizational support, and the initiative fades away. (Academic staff, 13)

The HTHT identity did fit well with the UT's older notion of commercialisation as creating new high-technology spin-offs using university intellectual property and with an obvious UT technological input. What this effectively meant was that individual academics within UT faced a whole set of unwritten criteria related to these organisational identity perceptions that had to be met for their social innovation to be deemed legitimate. The individual agency was constrained by the embedded agency produced by the institutional logic of "high tech." The dominant high tech logic did not *block* the social innovation but rather generated resistance via an illegitimating critique experienced by those engaged in social innovation.

The interviews revealed less direct embedded agency exerted by global excellence, although we here highlight three issues (a) the social sciences had lost their own research institution to facilitate a drive for excellent science (b) English has become the almost exclusive medium of education (c) internal promotion emphasised winning large-scale research funding from a very limited set of sources. Interviewees reported feeling that "excellence" was regarded as being exclusively reserved to the technical faculties, partly because technical faculties could attract substantial external funding but also the technological sciences publication patterns (many multi-authored journal articles) looked more impressive than the social sciences. Interviewees expressed discontent regarding the instrumental treatment of social sciences:

If technological faculties here even consider working with us, they do so in a very very instrumental fashion by saying we got new technologies and we all the time discover there is societal resistance. Can you come up with the tools to persuade these people? That is very much the dominant type of thing whereas our impact on society would be far greater if we did not start with technological knowledge but we start with societal challenges in this region.

(Academic staff, 19)

Another faculty member observed:

It is not really like a rule or regulation. When you start working here, you slowly realise this (developing social innovation initiatives) is not a culture here and other things like external funding, publications and start-ups are more important.

(Academic staff, 11)

The high technology and global excellence logics did intertwine: global excellence presupposes greater deployment of resources for publications and pure excellent research, channelling resources to technological sciences which in turn delivers the high tech logic via commercialisation. These two strong logics marginalise social innovation, which can only contribute to legitimate institutional goals in a limited way. Social innovation thus cannot find a mechanism for its own logics to be institutionally embedded.

6 | THE INSTITUTIONAL SPACE FOR SOCIAL INNOVATION IN THE UNIVERSITY OF AVEIRO

The institutional space for social innovation at UA was determined by competing logics between academic staff with engineering background and the designers, around the value of design and social innovation and the appropriate methods to tackle grand challenges. Engineers and their belief system were long established within UA and their logic remained dominant as design logic emerged in parallel in contributing social innovation through the 2010s. Designers' international collaborations with other partners was important in supporting and sustaining the design logic, as was noted around one critical juncture:

> *We knew that they (the management) always wanted to appoint an engineer for the Design Factory. We invited designers from very prestigious universities in Europe for a very important meeting here. In their conversation, I think one of them told "I can not imagine of an engineer becoming head of the Design Factory." I think it was that moment when they (rectory team) realized it would be very awkward to assign an engineer instead of a designer.*
>
> *(Academic staff, 5)*

Designers acknowledged engineering's contribution for both the region and UA, identifying opportunities to initiate interdisciplinary collaboration with them to contribute social innovation for regional benefit. However, they regarded design skills and their capacity to tackle social challenges was undervalued in UA as a result of the engineers' organisational domination. An academic employee noted, "I think they (engineers) do not realize the importance of design. The entire university actually does not realize it" (Academic staff, 16). Another designer added "we are seen as crazy people, crazy department with unrealistic solutions" (Academic staff, 9). These ideas resonated with another academic:

> *If we want to create a course like engineering and design, they do not allow us to use the word engineering. Why? Because apparently we are not engineers. But if you want to create this course or another course like design and engineering in an engineering department, they will let you do that. They will not consider that they are not designers.*
>
> *(Academic staff, 14)*

A fourth academic reflected on their recent dialogue with the rectory team:

> *One of [the rectory team] told me that a company contacted and asked for guidance because they wanted to create an environment friendly oven. They sent the company to the mechanical engineering department. I asked why. They told me because it is engineering's job. I said no, we have just collaborated with another company in creating an oven.*

They were very surprised … I really have big struggles in convincing them what design is and how significant it is.

(Academic staff, 6)

Many engineers also questioned the necessity of social innovation for tackling the grand challenges. "I completely understand and accept it (academics' contribution to tackling grand challenges). I just do not understand why we have to do this with social innovation" (Academic staff, 3). Many engineers' scepticism towards the notion of social innovation appears to be related to its potential threat for their professional identity, one engineering academic arguing "We should stop stretching of our professions. We are engineers and we do engineering, not social innovators. Everyone should do what they are good at" (Academic staff, 11).

The UA's administrative apparatus also created barriers to social innovation, in particularly through two mechanisms namely (a) the career evaluation algorithm known as Padua (*Plataforma de Avaliçao dos Docentes de Universidade de Aveiro*) and (b) increasing teaching loads. Padua was a complex computer algorithm measuring academic staff outputs, scoring all staff from 1–100 based on their activities (research, teaching, administrative tasks, and society engagement) and had a very complex formula. Faculty member were overwhelmingly negative of the system because of its flaws; periods of maternity leave were still counted for the overall evaluation period, and the minimum teaching load was 40% and very high. The formula was peculiar in systematically giving higher scores to academics who only entered teaching, research and administrative loads instead of all four including societal engagement. Padua counted social innovation activities as societal engagement, which received a relatively low score loading within the overall evaluation system.

Increasing teaching loads (partly resulting from austerity) were an additional barrier to academic participation in social innovation. As two staff members noted:

I had lots of them (social innovation initiatives) before this period (budget cuts of 2012 and 2013). But since then, I have been teaching more and more. I had to stop them because there is very little time for social innovation, in fact even for research.

(Academic staff, 17)

I am also in the directory board and I am responsible to distribute the classes among professors and lecturers. For the next year, we will have 6 less faculty members, 4 will be retired and 2 of them has gone to the rectory team. And only one new professor will be hired while at the same time we have almost the same number of students and courses.

(Academic staff, 15)

6.1 | INSTITUTIONAL BARRIERS STEMMING FROM INSTITUTIONAL SPACE

We identified two institutional logic configurations for each institution, the UT's *convergence* of "high technology" and "global excellence", framing engagement as delivering innovative high-tech products with social innovation *potential*, and UA's *competing* engineering and design logics, with their own assumptions about appropriate societal contributions. We now explore how these institutional logics affected social innovation's institutionalisation as an institutional logic in terms of

creating persistent belief systems regarding identities, value systems and urgency. The UT's two strong cores of technology and excellence, resisted social innovation on its own terms from within the institution. In UA, where the design logic was relatively strong and legitimate, there was a tempering of its capacity to achieve change by a preference for the engineering logic.

The first element by which institutional logics exert embedded agency is an *identity effect*. In both cases the core institutional logics either worked to block the emergence of a strong and stable identity around delivering social innovation (UT) or decelerated the advancement of an emerging identity supportive of social innovation (UA). We decompose this destabilising effect into two elements. Firstly, in both universities, the dominant academic staff profile is technical scientists who appeared to regard social innovation as being less valuable than technological innovation. The second element is that social scientists, in particular in the UT were framed and portrayed as being marginal to the institutional identity, making those identities liminal, and undermining any basis for social scientists' self-confident behaviour.

There were differences between the two universities; UA's social scientists managed to develop stable identities relating to social innovation, which was not the case at UT. In UA, design academics developed stable identities as "design scientists," realising the implementation of designable human systems, part of a broader epistemic community within UA. That was aided by collaboration with a group of engineers who were willing to go beyond a purely engineering approach to external engagement. In addition, the national government regularly emphasised the importance of social innovation, and other external stakeholders impressed upon UA senior managers their expectations that UA should deliver meaningful societal contribution manifested through social innovation. In UT, social innovators' identities were far more liminal, reporting feeling under pressure and professionally threatened, without a capacity to find epistemic validation within their own environments. They believed there was a mismatch between what they wanted to achieve (and believed to be good behaviour), and what they believed their employer wanted them to be doing. They experienced this mismatch as a kind of continual denigration of social innovation by their employers. One academic expressed that thus:

> *The issue with them (social sciences) is that their role has been reduced to responding to criticism made by society. It is like this: The university receives criticism for not engaging with the society, and not contributing to local people. To respond these, UT invites us (social scientists) and says: 'Can you please explain to these people that our products are already benefiting them?*
>
> *(Academic staff, 3)*

The second element of embedded agency relates to the *institutional belief* in the value of a particular activity, and particularly that beliefs in the importance of engagement with social partners (a prerequisite for social innovation), was crowded out by other kinds of institutional beliefs. The first of these was the belief that the primary focus of engagement should be commercially focused and oriented towards businesses. Both institutions had strong rationales for business engagement, being created to drive regional development. Those contexts profoundly influenced both those universities' strategic relationships with external partners, as well as the professional routines and norms of those academics, notably those more senior academics that were influential in determining attitudes towards engagement. Their evolution also affected their engagement infrastructures, which shaped the contemporary possibilities. The extensive exposure of UT to expensive high-technology infrastructures have encouraged engagement activities with well-configured users able to pay for those services, and subsidise those infrastructures for academic staff. This shaped the ways that stakeholders' imprimatur legitimated certain activities; partners that could pay for services were seen as being legitimate stakeholders. Conversely, in UA, the enthusiasm of the public

sector for the promotion of social innovation helped to support the emergence of a kind of social innovation identity, which fitted with the availability of subsidies and the research center focusing on social innovation that helped legitimate social innovation.

The third element of embedded agency relates to activities' *urgency* as articulated in the university's internal allocative model economy. Both their internal models acted as embedded agency, hindering social innovation by framing it as "uneconomic" unless the activity generated income (such as from Structural Funds or other European funding grants). The UT's internal economy used an internal financial allocation model where departments and faculties generated income through teaching, research, and third mission activities, and were charged for the use of university resources (staff time, classrooms, and laboratories). The UA internal economy operated through the workload model, which created shadow prices for various kinds of university activity, with staff being managed to deliver various activities to achieve a particular price level. The price of social innovation activities was comparable to relatively light touch activities such as media appearances. Given UA's high teaching loads, and the low quantum available for social engagement activities, the price of social innovation in the internal model created real-time deficits for individuals.

These three elements, identity, institutional belief, and urgency demonstrate the relative intransigence of universities' contributions to regional development and their insufficient responsiveness to supposedly urgent pressures. Both institutions' regional missions and orientations were framed by institutional dynamics that emerged within a decade of their founding (the high-technology reindustrialisation of Twente and technology transfer to Aveiro businesses). The institutional identity and belief change at the time scale of the decade, with the determinants of these regional roles are not just regional policy but also the wider epistemic communities within which researchers are active. This is a recurrence of the problem that Cooke (2005) identified as the scalar envelope, assuming that the factors that affect regional innovation behaviours are purely regional in their scope. This suggests that improving the societal role of universities outside of this "scalar envelope" requires both funders and academic societies to adopt new identities and regulations. These would place societal contributions to innovation ecosystems as being desirable for universities (just as the desirability of academic entrepreneurship was built up over a generation, Ziman, 2002) and thereby allow this desirable but difficult element of innovative ecosystems to emerge.

7 | CONCLUSION AND DISCUSSION

In this paper, we have sought to answer the question of whether universities' failure to systematically engage with social innovation can be explained in terms of university institutional logics. In the introduction, the dominance of techno-economic perspectives on innovation was identified as a key reason why social innovation has yet to be explored within orthodox innovation studies, including here in the roles of universities in innovation. It was notable in the study that the two universities studied were not exempt from this techno-economic domination, albeit one that presented in different ways in the two institutions (either as being a secondary consideration or as one that was unaffordable).

In both universities, the institutional logic encouraged academics to construct social problems as being solvable mainly through the use of technology or traditional third mission tasks such as contract research and industry collaboration (a framing effect). There was a parallel damping effect: those activities which used university knowledge for social innovation were delegitimised and/or rendered invalid, less valuable, and prevented them becoming more important to the institution. Three university institutional processes supported these dynamics, academic identity formation processes, organisational legitimisation processes, and internal allocative models, related to the three mechanisms of

university logics; academic identities, legitimacy and urgency. We thus contend that this approach might be more generally useful for understanding how universities can contribute to a broader selection of innovation systems.

The first issue relates to the absence of stable academic identities supporting social innovation. Stable academic identities are associated with legitimate practices: thirty years ago commercial engagement suffered from the absence of a stable academic identity. The emergence of commercialisation as a legitimate mission involved constructing stable entrepreneurial academic identities (Ziman, 2002). Government, education ministries, research funders, and institutions channelled resources and recognition to engaged entrepreneurial academics. Developing stable academic identities for non-technoeconomic innovation activities (e.g., around community engagement) requires similar resources and recognition for social innovation, reaffirming, and remaking those identities' legitimacy.

The second element relates to the perceived legitimacy of social innovation by university peer communities. Social innovation is a normative concept, premised on a belief that social structures produce unfair outcomes and therefore those structures need to be changed. That normativity may sit uncomfortably with disciplines that are unaware of the (not always positive) social impact of technological changes (Bozeman, Fay, & Slade, 2013; Derrick, Faria, Benneworth, Budtz-Petersen, & Sivertsen, 2018) with technological researchers unaware of their own highly normative worldview of the value of technological progress.

The third element relates to the urgency of social innovation expressed via internal allocative models, where a price/cost imbalance emerges: the "cost"—the time it takes individuals to produce social innovation outcomes—is less than the "price" their internal allocative systems pays for them. Synergies can be built, for examples where *students* deliver social innovation within education programmes, thereby generating an "income" in terms of study points. This special issue is concerned with non-core innovation, and it is perhaps unsurprising that non-core activities are under-rewarded in internal allocation models. These internal allocation models often reflect external pressures, such as funder demands or needs. Therefore, this suggests that encouraging universities to take social innovation (and other kinds of subaltern innovation more generally) seriously requires giving universities incentives to ensure their internal allocative models to supporting broader versions of innovation.

We also acknowledge that this is a European study and therefore addresses the connection between social innovation in a very Eurocentric way, reflecting the fact that universities have never really had formally societal missions, other than arguably in the 1970s to become oriented towards mass democracies (Daalder & Shils, 1982; Delanty, 2002). Tapia (2008) highlighted the fact that in Latin America, a series of protests spread out from universities starting in Cordoba, Argentina in 1919, against the elite closure of universities. This led to a series of reforms in these countries in which universities were connected much more closely to their societies, with much greater societal duties, even being used as a way of providing social services in remote places (e.g., Ramirez, 2011). We would, therefore, urge those interested in universities and social innovation to look to these examples of Latin American universities' social missions to better understand the way that university knowledge processes can support social innovation in various ways.

The case of social innovation provides a useful lens to understand a core question within this special issue, namely why non-core innovation systems have such difficulties attracting attention. We perceive in our case a peripherality effect for social innovation; because key innovation actors view social innovation as being marginal, this builds up to a systemic effect, mediated by institutions, in which it is made harder to achieve social innovation by inhibiting and damping enabling norms, values, and regulations. University internal rules are focused towards institutionally necessary transactions, and orienting those rules towards economic transactions & technological innovation makes social transactions much harder to fit into university. This is even true for researchers who are primarily or even

exclusively concerned with social innovation rather than technological innovation. But these dominant perspectives have become locked-into universities through their institutional logics. Although these institutional logics can change (and new institutional logics continually emerge), a non-core innovation approach faces these various pressures that delegitimise it and prevent its systematisation.

Our research is a relatively small intensive case study of two examples of universities that have missions, which are at least open for societal engagement, and this has two potential implications for applying our findings to other kinds of institutions. A first reading might be that these are young, dynamic institutions that made a serious effort to promote social innovation, and yet internal institutional logics hindered those efforts. One might thus expect more established universities to find it much harder than these new, young universities to stimulate social innovation. But an alternative possibility, related to the unthinking epistemological dominance of science and technology subjects at these newer universities is that older universities (particularly those founded before the 19th century) have traditionally had a much stronger core in the humanities and social sciences. That might remain visible in their contemporary institutional logics thereby helping those institutions to regard social innovation as a more legitimate and valuable university activity.

Clearly more work is required in understanding the institutional logics that shape engagement with non-core innovation activities in other kinds of universities, what Uyarra (2010) called the knowledge factories, the relational universities and systemic universities. And this allows us to make our general contribution to the topic of this special issue, in bringing systems approaches "out of their comfort zone." It has clearly been very "comfortable" to treat universities as strategically managed technology agencies rather than the complex constellation of knowledge coalitions that are continually finding ways of remaining working together within a single organisation. Universities are nebulous collectives of connections by individuals and teams with their very own knowledge needs and belief systems. These actors are in turn shaped by the institutional logics of the universities in which they sit, and that frames the ways they can respond to societal dilemmas, even where those framings are explicitly denied by strategic managers. We conclude with this challenging message, namely those studying how universities contribute to particular societal needs should pay more heed to the constraints imposed by those institutions' internal mechanisms and dynamics. Without moving outside the comfort zone, innovation studies will be ill-equipped to provide convincing explanations of the ways that universities can work within wider territorial coalitions to deliver the necessary societal transitions demanded by the 21st century's challenges.

ACKNOWLEDGEMENT

The authors acknowledge that the paper was supported by funding from the European Commission's Horizon 2020 Research and Innovation Programme (Marie Sklodowska-Curie Actions) grant agreement No: 722295.

CONFLICT OF INTEREST

Authors report that there is no potential conflict of interest.

ORCID

Ridvan Cinar https://orcid.org/0000-0002-5640-224X
Paul Benneworth https://orcid.org/0000-0003-0539-235X

REFERENCES

Ackoff, R. L. (1999). *Ackoff's best—His classic writings on management*. New York, NY: John Wiley.

Arbo, P., & Benneworth, P. (2007). Understanding the regional contribution of higher education institutions: A literature review. OECD, Directorate for Education, Working Paper N. 9, (1), 1–78. https://doi.org/10.1787/161208155312

Asheim, B. T., & Isaksen, A. (1997). Location, agglomeration and innovation: Towards regional innovation systems in Norway? *European Planning Studies*, *5*(3), 299–330. https://doi.org/10.1080/09654319708720402

Avelino, F., Wittmayer, J. M., Pel, B., Weaver, P., Dumitru, A., Haxeltine, A., … O'Riordan, T. (2017). Transformative social innovation and (dis)empowerment. *Technological Forecasting and Social Change*, *145*, 195–206. https://doi.org/10.1016/j.techfore.2017.05.002

Barkley, D. L., Henry, M. S., & Nair, S. (2006). Regional innovation systems: Implications for non-metropolitan areas and workers in the South. *Growth and Change*, *37*(2), 278–306. https://doi.org/10.1111/j.1468-2257.2006.00318.x

Battilana, J. (2006). Agency and institutions: The enabling role of individuals' social position. *Organization*, *13*(5), 653–676. https://doi.org/10.1177/1350508406067008

Benneworth, P., & Cunha, J. (2015). Universities' contributions to social innovation: Reflections in theory & practice. *European Journal of Innovation Management.*, *18*(4), 508–527. https://doi.org/10.1108/EJIM-10-2013-0099

Benneworth, P., Effie, A., Edwards, Schachter M., & Gulbrandsen, M. (2015). Social innovation futures: beyond policy panacea and conceptual ambiguity. Working paper for the TIK Group Series No: 20150127. Retrieved from https://www.researchgate.net/profile/Monica_Edwards-Schachter/publication/271504199_Social_innovation_futures_beyond_policy_panacea_and_conceptual_ambiguity/links/54c9eead0cf2807dcc284cad.pdf

Benneworth, P., & Fitjar, R. (2019). Contextualizing the role of universities to regional development: Introduction to the special issue. *Regional Studies, Regional Science*, *6*(1), 331–338. https://doi.org/10.1080/21681376.2019.1601593

Benneworth, P., & Hospers, G.-J. (2007). The new economic geography of old industrial regions: Universities as global-local pipelines. *Environment and Planning C: Politics and Space*, *25*(6), 779–802. https://doi.org/10.1068/c0620

Benneworth, P., Pinheiro, R., & Karlsen, J. (2017). Strategic agency and institutional change: Investigating the role of universities in regional innovation systems (RISs). *Regional Studies*, *51*(2), 235–248. https://doi.org/10.1080/00343404.2016.1215599

Bozeman, B., Fay, D., & Slade, C. P. (2013). Research collaboration in universities and academic entreprenuership: The-state-of-the-art. *The Journal of Technology Transfer*, *38*(1), 1–67. https://doi.org/10.1007/s10961-012-9281-8

Brundenius, C., Göransson, B., & Mello, J. M. C. (2017). *Universities, inclusive development and social innovation*. Cham, Switzerland: Springer.

Caulier-Grice, J., Davies, A., Patrick, R., & Norman, W. (2012). Social innovation overview: A deliverable of the project: "The theoretical, empirical and policy foundations for building social innovation in Europe" (TEPSIE), In *European Commission 7th Framework Programme*. Brussels: European Commission, DG Research.

Cooke, P. (2005). Regionally asymmetric knowledge capabilities and open innovation: Exploring "Globalisation 2"—A new model of industry organization. *Research Policy*, *34*(8), 1128–1149. https://doi.org/10.1016/j.respol.2004.12.005

Daalder, H., & Shils, E. (1982). *Universities, politicians and bureaucrats. Europe and the United States*. Cambridge, UK: Cambridge University Press.

Delanty, G. (2002). The university and the modernity: A history of the present. In K. Robins & F. Webster (Eds.), *The virtual university: Knowledge, markets and management* (pp. 31–48). Oxford, UK: Oxford University Press.

Derrick, G., Faria, R., Benneworth, P., Budtz-Petersen, D., & Sivertsen, G. (2018). Towards characterising negative impact: Introducing Grimpact. Paper presented at Science, Technology & Innovation indicators in Transition. Leiden, the Netherlands, 12–14 September 2018. Retrieved from http://hdl.handle.net/1887/65230/

Dias, J. M., Lopes, J. F., & Dekeyser, I. (1999). Hydrological characterisation of Ria de Aveiro, Portugal, in early summer. *Oceanologica Acta*, *22*(5), 473–485. https://doi.org/10.1016/S0399-1784(00)87681-1

Enders, J., & de Boer, H. (2009). The mission impossible of the European University: Institutional confusion and institutional diversity. In A. Amaral, G. Neave, C. Musselin, & P. Maassen (Eds.), *European Integration and the Governance of Higher Education and Research*. https://doi.org/10.1007/978-1-4020-9505-4

European Commission. (2018). *A European ecosystem for social innovation*. Luxembourg: Publication Office of the European Union.

Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*, *5*(1), 80–92. https://doi.org/10.1177/160940690600500107

Friedland, R., & Alford, R. (1991). Bringing society back in. *The New Institutionalism in Organizational Analysis*. Retrieved from https://doi.org/citeulike-article-id:262887

Fulgencio, H., & Lefever, H. (2016). What is the social innovation system: A state-of-the-art review. *International Journal of Business Innovation and Research*, *10*(2/3), 434–452. https://doi.org/10.1504/IJBIR.2016.074837

Goddard, J., Hazelkorn, E., & Vallance, P. (2016). *The civic university. The policy and leadership challenges*. Northampton, MA: Edward Elgar Publishing.

Goddard, J., & Vallance, P. (2013). *The university and the city*. Abingdon, England: Routledge.

Göransson, B. (2017). Role of universities for inclusive development and social innovation: Experiences from Sweden. In C. Brundeuis, B. Göransson, & M. J. Carvalho (Eds.), *Universities, inclusive development and Social innovation* (pp. 349–367). Cham, Switzerland: Springer.

Greatrix, P. (2019). *Dumb and dumber: All new dumbest university rankings 2019*. Registrarism, 7th October 2019. Retrieved from https://wonkhe.com/blogs/dumb-and-dumber-all-new-dumbest-university-rankings-2019/

Hazelkorn, E. (2011). *Rankings and the reshaping of higher education: The battle for world-class excellence*. London, UK: Palgrave Macmillian.

Howaldt, J., Kaletka, C., Schröder, A., Rehfeld, D., & Terstriep, J. (2016). Mapping the world of social innovation. Key results of a comparative analysis of 1005 social innovation initiatives at a glance. Retrieved from https://www.si-drive.eu/wp-content/uploads/2016/12/SI-DRIVE-CA-short-2016-11-30-Druckversion.pdf

Kleverbeck, M., Mildenberger, G., Schröer, A., & Terstriep, J. (2019). Regional social innovation networks. In S. Weber, I. Truschkat, C. Schröder, L. Peters, & A. Herz (Eds.), *Organisation und netzwerke: Organisation und padagogik* (Vol. *26*). Wiesbaden: Springer.

Kuhlman, S., & Rip, A. (2018). Next-generation innovation policy and grand challenges. *Science and Public Policy.*, *45*(4), 448–454. https://doi.org/10.1093/scipol/scy011

Lendel, I., & Qian, H. (2017). Inside the great recession: University products and regional economic development. *Growth and Change: A Journal of Urban and Regional Policy*, *48*(1), 153–173. https://doi.org/10.1111/grow.12151

Lundvall, B.-Å. (1988). Innovation as an interactive process: From users-producers interaction to the national system of innovation. In G. Dosi, C. Freeman, R. Nelson, G. Silverberg, & L. Soete (Eds.), *Technical Change and Economic Theory*. https://doi.org/10.1038/468377b

McKelvey, M., & Zaring, O. (2018). Co-delivery of social innovations: Exploring the university's role in academic engagement with society. *Industry and Innovation*, *25*(6), 594–611. https://doi.org/10.1080/13662716.2017.1295364

Motoyama, Y., & Mayer, H. (2017). Revisiting the roles of the university in regional economic development: A triangulation of data. *Growth and Change: A Journal of Urban and Regional Policy*, *48*(4), 787–804. https://doi.org/10.1111/grow.12186

Moulaert, F., Mehmood, A., MacCallum, D., & Leubolt, B. (2017). Social innovation as a trigger for transformations: The role of research. *European Commission, DG for Research and Innovation*, 108p. https://doi.org/10.2777/68949

Mulgan, G. (2007). Social innovation: what it is, why it matters and how it can be accelerated. Working paper. Skoll Centre for Social Entreprenuership, Oxford. Retrived from http://eureka.sbs.ox.ac.uk/761/. 12 January 2019.

Perkman, M., Tartari, V., Kelvey, M., Autio, E., Broström, A., D'Este, P., … Sobrero, M. (2013). Academic engagement and commercialization: A review of the literature on university-industry relations. *Research Policy*, *42*(2), 423–442. https://doi.org/10.1016/j.respol.2012.09.007

Pinheiro, R., Langa, P. V., & Pausits, A. (2015). One and two equals three? The third mission of higher education institutions. *European Journal of Higher Education*, *5*(3), 233–249. https://doi.org/10.1080/21568235.2015.1044552

Popp Berman, E. (2012). *Creating the market university. How academic science became an economic engine*. Princeton, NJ: Princeton University Press.

Ramirez, A. S. (2011). The role of universities in promoting rural innovation in Latin America. *Regional Insights*, *2*(1), 24–25. https://doi.org/10.1080/20429843.2011.9677983

Reay, T., & Hinings, C. R. (2009). Managing the rivalry of competing institutional logics. *Organization Studies*, *30*(6), 629–652. https://doi.org/10.1177/0170840609104803

Rodrigues, C., & Teles, F. (2017). The fourth helix in smart specialization strategies: The gap between discourse and practice. In S. Monteiro, & E. G. Carayannis (Eds), *The quadruple innovation Helix Nexus* (pp. 205–226). New York, NY: Palgrave Macmillian.

Schumpeter, J. A. (1931). *Theorie der wirtschaflichten entwicklung, eine untersuchtung uber unternehmergewinn, kapital, kredit, zins und den konjunkturzyklus*. Berlin, Germany: Duncker & Humblot.

Scott, W. R. (2008). *Institutions and organizations: Ideas, interests, and identities*. London, UK: Sage Publications.

Sewell, W. H. (1992). A theory of structure: Duality, agency and transformation. *American Journal of Sociology*, *98*(1), 1–29. https://doi.org/10.1086/229967

Tapia, M. N. (2008). Service learning in Latin America. Past and present. In J. C. Kielsmeier, T. J. Leeper, M. Neal, & N. Schultz (Eds.), *Growing to greatness: The state of service-learning project* (pp. 4–7). St. Paul, MN: National Youth Leadership Council.

Thornton, P. H., & Ocasio, W. (1999). Institutional logics and historical contingency of power in organizations: Executive succession in the higher education publishing industry, 1958–1990. *American Journal of Sociology*, *105*(3), 801–843.

Thornton, P. H., & Ocasio, W. (2008). Institutional logics. In R. Greenwood, C. Oliver, T. B. Lawrence, & R. E. Meyer (Eds.), *The Sage handbook of organizational institutionalism* (pp. 99–129). London, UK: Sage Publications.

Thornton, P. H., Ocasio, W., & Lounsbury, M. (2012). Introduction to the institutional logics perspective. In P. H. Thornton, W. Ocasio, & M. Lounsbury (Eds.), *The institutional logics perspective: A new approach to culture, structure, and process*. https://doi.org/10.1093/acprof

Uyarra, E. (2010). Conceptualizing the regional role of universities, implications and contradictions. *European Planning Studies*, *18*(8), 1227–1246. https://doi.org/10.1080/09654311003791275

Uyarra, E., Flanagan, K., Magro, E., Wilson, J. R., & Sotarauta, M. (2017). Understanding regional innovation policy dynamics: Actors, agency and learning. *Environment and Planning C: Politics and Space*, *35*(4), 559–568. https://doi.org/10.1177/2399654417705914

Van den Broek, J., Benneworth, P., & Rutten, R. (2019). Institutionalization of cross-border regional innovations systems: The role of university institutional enterprenuers. *Regional Studies, Regional Science*, *6*(1), 55–69.

Van der Have, R. P., & Rubalcaba, L. (2016). Social innovation research: An emerging area of innovation studies? *Research Policy*, *45*(9), 1923–1935. https://doi.org/10.1016/j.respol.2016.06.010

Weick, K. E. (1976). Educational organisations as loosely coupled systems. *Administrative Science Quarterly*, *21*(1), 1–19.

Yin, R. K. (2003). *Case study design and methods*. Newbury Park, CA: Sage Publications.

Ziman, J. (2002). *Real science. What it is and what it means*. Cambridge, UK: Cambridge University Press.

How to cite this article: Cinar R, Benneworth P. Why do universities have little systemic impact with social innovation? An institutional logics perspective. *Growth and Change*. 2020;00:1–19. https://doi.org/10.1111/grow.12367

Regional Studies, Regional Science

ISSN: (Print) 2168-1376 (Online) Journal homepage: https://www.tandfonline.com/loi/rsrs20

Delving into social entrepreneurship in universities: is it legitimate yet?

Ridvan Cinar

To cite this article: Ridvan Cinar (2019) Delving into social entrepreneurship in universities: is it legitimate yet?, Regional Studies, Regional Science, 6:1, 217-232, DOI: 10.1080/21681376.2019.1583602

To link to this article: https://doi.org/10.1080/21681376.2019.1583602

Published online: 08 May 2019.

REGIONAL STUDIES, REGIONAL SCIENCE
2019, VOL. 6, NO. 1, 217–232
https://doi.org/10.1080/21681376.2019.1583602

Routledge
Taylor & Francis Group

Regional Studies Association

Delving into social entrepreneurship in universities: is it legitimate yet?

Ridvan Cinar

ABSTRACT

Universities have recently been pressurized to go beyond their economic conceptualization of third-mission activities and contribute to solving grand societal challenges in the regions in which they are located. Social entrepreneurship has emerged as one mechanism by which universities can address societal challenges. Despite a growing awareness of universities' potential and expectations to enhance social entrepreneurship in their geographical vicinities, how these processes become legitimized within a higher education context has received surprisingly little attention. This paper, therefore, explores factors affecting the (de)legitimacy process of social entrepreneurship within universities. Using a single case study design that relies on semi-structured interviews carried out in a Dutch public university, it was found that organizational legitimacy of social entrepreneurship remains unestablished. Furthermore, the legitimacy process is affected by (1) the expectations of stakeholders, the difficulty of measuring social impact and third-mission indicators; (2) an overemphasis on high-tech research and application as an organizational identity; (3) the absence of a leader in the field and lack of organizational recognition; and (4) stringent regulations of public institutions in the Netherlands. In addition, enhancing social entrepreneurs is hindered by the lack of place-based belonging among the student body. Consequently, this paper argues that a holistic approach that focuses on the specificities of universities and the increasing competitive environment in which they have come to function, the potential facilitating role of other organizational actors in the field, and designing appropriate policy instruments and incentives would benefit universities in their efforts to enhance social entrepreneurship.

ARTICLE HISTORY

Received 29 September 2018; Accepted 12 February 2019

KEYWORDS

social entrepreneurship; universities; new institutionalism; legitimacy; place-based belonging; third mission

JEL CLASSIFICATIONS

I23; L31; D23

INTRODUCTION

There is an increasing awareness regarding the emergence of a class of large-scale problems challenging contemporary society, such as climate change, inefficient use and lack of resources, urban sustainability, and democratic security, that require concerted and coordinated action from a range of partners. Recognizing the limitations of both the public and private sectors to produce mass, coordinated and flexible responses, there is growing interest in new forms of coordinating mechanisms that allow for solutions to these societal challenges to be developed. Social

CONTACT

(Corresponding author) rcinar@ua.pt

Department of Social Political and Territorial Sciences, University of Aveiro, Aveiro, Portugal.

entrepreneurship has been acknowledged as one such potential mechanism where actors create new forms of social organizations, structures and institutions that help solve these challenges (Dees, 1998; Nicholls, 2006).

Social entrepreneurship has recently garnered the interest of policy-makers, particularly in Europe. In its *Entrepreneurship 2020 Action Plan*, the European Commission (EC) stressed the significance of social entrepreneurship as follows: 'We must work on ensuring that being an entrepreneur is an attractive prospect for Europeans. This also includes social entrepreneurs whose potential is often underestimated' (European Commission, 2013, p. 5). The action plan and successive policy briefs as well as official statements have called for a greater contribution of universities to enhance social entrepreneurship. Therefore, it is surprising that whilst universities are expected to make substantive contributions to social entrepreneurship, there is almost no consideration of the way these processes function within the context of higher education.

The key issue for social entrepreneurship in universities is the lack of a clear connection to the core tasks of the university. In more traditional technology venturing processes, university knowledge resources are converted in terms of exploitable assets that may ultimately generate revenue streams, thereby legitimizing university entrepreneurship activities. However, social entrepreneurship processes typically involve changes in social processes and organization, not necessarily in monetized settings, benefiting the poorer segments of society, unable to provide formal returns to the university knowledge input. This raises the question of how universities legitimize their engagement in social entrepreneurship, particularly in terms of choices regarding which social challenges, societal partners and beneficiaries.

Suchman (1995, p. 574) posits that 'legitimacy is a generalized perception or assumption that the actions of an entity are desirable, proper or appropriate within some socially constructed system of norms, values, beliefs and definitions'. Institutions shape the behaviour of their members by delineating what is expected of them in numerous social circumstances, the foundations of which lie on constructing values and beliefs over time in order to elicit and shape proper actions (Scott, 2008). Having stated that, it is critical to explore whether contributions to social entrepreneurship have manifested themselves as one of the anticipated proper actions in universities, thereby shedding a light onto its (de)legitimacy. Accordingly, this paper will primarily seek to address the overall research question: Which factors affect the legitimacy processes of social entrepreneurship within universities?

The paper is structured as follows. First, it reflects on the two main strands of social entrepreneurship drawn from the literature and provides a brief account of organizational legitimacy. Second, it focuses on the universities' contributions to social entrepreneurship as a third-mission activity and argues that they seek legitimacy in three phases. Third, it outlines in detail the data and methods. Fourth, it presents the findings, elaborating on factors affecting the legitimacy of social entrepreneurship within a public higher education institution: the University of Twente (UT), the Netherlands, in this case. Lastly, it discusses the findings and concludes with paving the way for new research avenues and implications on academics and policy-makers alike.

SOCIAL ENTREPRENEURSHIP: A CONCEPTUAL BACKDROP

The term 'social entrepreneurship' first appeared in the social change literature in the 1960s and 1970s (Gray, 2012), a period when the demand for change was great across the world and resonated considerably with individuals. The 1990s witnessed a theory-building process for social entrepreneurship that paved the way for its gaining momentum in scholarly literature, and raised its popularity in the policy sphere (Dees, 1998; Leadbeater, 1997). In spite of the fact that firms that intended to help solve socioeconomic challenges sowed the first seeds of the social

entrepreneurship literature (Shintani, 2011), the concept, as well as the literature, has evolved to encompass civil–society initiatives in the form of non-governmental organizations, not-for-profit organizations, community projects, cooperatives and social enterprises (Cunha, Benneworth, & Oliveira, 2015; Dees, 1998; Seelos & Mair, 2005). Various perspectives from several scholarly disciplines, such as business administration, management, sociology, development studies and economics, have led to social entrepreneurship becoming what Choi and Majumdar (2014, p. 365) characterize as 'an essentially contested concept'. Whereas some researchers regard social entrepreneurship as the establishment of businesses to benefit the poorer segment of societies (Seelos & Mair, 2005), others view it as a means of harnessing social innovations to generate solutions for social problems and thus trigger social change, regardless of whether or not they entail commercial activities (Dees, 1998). Among a variety of descriptions, this paper adheres to Dees' (1998, p. 4) definition of a social entrepreneur as it corresponds to the contextual setting (legitimization of social entrepreneurship in a public university) of this research:

> Social entrepreneurs play the role of change agents, in the social sector, by; adopting a mission to create and sustain social value (not just private value); recognizing and relentlessly pursuing new opportunities to serve that mission; engaging in a process of continuous innovation, adaptation and learning; acting boldly without being limited by resources currently in hand; and exhibiting heightened accountability to the constituencies served and outcomes created.

From this perspective, social entrepreneurs can bring about small-scale changes (economic, cultural and/or political) that echo within the dominant system of structures and trigger large-scale changes in the long run. However, they need to be familiar with the broader social system, its spatial characteristics and the actors involved in order to concentrate on the alleviation of the roots of social challenges (Alvord, Brown, & Letts, 2004). It can be argued that this process would require some sort of place-based belonging, particularly for those who are new to any social system, such as university students who hail from different cities and countries. Place-based belonging is a process whereby an individual's attachment to a place is constructed through socio-spatial practices, such as participating in local events, relaxing in a park, etc. (Benson & Jackson, 2012), thus creating memories and meaning surrounding the place (Scannell & Gifford, 2010). As such, it is important that potential social entrepreneurs develop place-based belonging if they are to become agents of sustainable, social transformation, especially on a local scale.

The road to sustainable social transformation is not unimpeded and linear, regardless of it being oriented locally or globally. Social entrepreneurs face numerous obstacles ranging from political and economic to cultural and socio-technical. They might overcome the challenges by mobilizing different stakeholders in the process, empowering the people involved and resorting to public, private and non-governmental organizations to use further the expertise required. Universities are regarded as organizations that have made prominent contributions to the regions and societies in which they are embedded (Arbo & Benneworth, 2007), and are understood as possessing the potential to take up the role of being an agent of change in the process of societal transformation, given the knowledge and human resources they contain. Yet, it is surprising that there is almost no consideration of how universities can become an agent of the process of sustainable social transformation, when their members attempt to act accordingly by enhancing social entrepreneurship. As such, it is essential to uncover how social entrepreneurship becomes legitimized (or not) within a higher education context, and how universities can foster social entrepreneurs that will seek effective changes in social systems among the immense, highly qualified, human resources they hold. The new institutional theory, therefore, provides a valuable conceptual lens that helps address the process of organizational legitimacy in a higher education institution.

LEGITIMACY IN UNIVERSITIES

Institutional theory has taken the academic stage since Selznick (1957) defined institutionalization as a process where practices are imbued with value, overshadowing the technical requirements of the tasks involved in an organization. Selznick's works regarding the institutionalization process laid the foundations for old institutionalism. As a reaction to the great emphasis put upon the internal dynamics within an organization, a new strand in institutional theory was established that directed its focus from the internal dynamics to the external environment. This new strand, traditionally depicted as new institutionalism, underlined the significance of shifting the focus to 'examine[ing] how the external environment socially construct[s] organizations, providing them with templates, for their formal structures and policies, and thereby increasing an organization's legitimacy in the wider world' (Powell & Bromley, 2015, p. 764). DiMaggio and Powell (1991, p. 8) provided the new strand of institutional theory with the following definition:

> The new institutionalism in organization theory and sociology comprises a rejection of rational-actor models, an interest in institution as independent variables, a turn toward cognitive and cultural explanations, and an interest in properties of supra-individual units of analysis that cannot be reduced to aggregations or direct consequences of individuals' attributes or motives.

A stream of research emerging out of developments in the new institutional theory is legitimacy. It is generally accepted that Max Weber introduced the concept (Johnson, Dowd, & Ridgeway, 2006). Legitimacy is one means by which universities inaugurate congruence between the norms and values of their behaviours and the expected proper actions of the broader social system in which they are embedded (Deephouse & Suchman, 2008). Maurer (1971, p. 361) argues that 'legitimation is the process whereby an organization justifies to a peer or superordinate system its right to exist, that is, to continue to import, transform and export energy, material or information'.

The organizational legitimacy is threatened when there is a prospect of disparity between the two systems of values, and consequently, the organizations either undergo required changes to harmonize their values with the subordinate system of which they are a part (Boxenbaum & Jonsson, 2008), or strive to alter the value of that particular subordinate system itself (Dowling & Pfeffer, 1975). However, Perrow (1970) notes that inasmuch as changing social values in a superordinate system is generally an arduous and risky journey to undertake, organizations are more likely to prefer adapting to the social system for legitimacy. This preference may have several consequences such as constraints on organizational behaviour. More specifically, when organizational practices do not conform to social norms and the values of the broader social system, these practices cease to exist (Dowling & Pfeffer, 1975).

Universities have sought legitimacy in numerous areas to be relevant for the social system in which they are embedded and to sustain their right to exist (O'Kane, Mangematin, Geoghegan, & Fitzgerald, 2015). The seeking and establishment of the process of legitimacy is manifest mostly through the practices imbued in third-mission activities, particularly when universities aspire to substantiate that they can collaborate with external stakeholders and contribute to addressing the wicked, global issues (Benneworth & Cunha, 2015). Third-mission activities – occasionally referred to as 'third stream' – correspond to links universities establish with actors of external environments such as firms, government bodies, the public, social enterprises and non-governmental organizations, in addition to their first and second missions: teaching and research (Laredo, 2007). Earlier understandings of the third mission centred around commercialization activities, which led to a wave of technology transfer offices in the 1980s and 1990s.

However, recently universities are being expected to go beyond pure commercialization activities, in their understanding of the third mission, and adopt a more developmental role by reaching out to civil society (Goddard, Hazelkorn, Kempton, & Vallance, 2016; Uyarra, 2010).

The contribution to social entrepreneurship can be characterized as one of the many third-mission activities through which universities can reach out civil society. Nevertheless, if social entrepreneurship is to be enhanced, the establishment of an organizational legitimacy is necessary. These processes require close monitoring of internal behaviours and external values. Scott (2008) has identified three institutional pillars, namely: regulative, normative and cultural–cognitive. Whereas the regulative pillar entails setting rules, monitoring members' conformity and, if necessary, a sanction/rewarding of them, the normative pillar elicits proper actions through norms and values. The cultural–cognitive pillar focuses on the cognitive dimension of an individual's perception of his/her environment, articulated as 'what a creature does is in large part a function of the creature's internal representation of its environment' (D'Andarade, 1984, p. 88). The basis of legitimacy for each pillar is 'legally sanctioned' (regulative), 'morally governed' (normative) and 'comprehensible, recognizable, culturally supported' behaviours (Scott, 2008, p. 60). Based on the three pillar-framework of institutions, it is argued here that the legitimacy in universities occurs in three phases, particularly if the normative or cultural–cognitive pillars are the dominant models inside.

Phase 1: Assessment of organizational values vis-à-vis the norms of a superordinate social system

In this phase, universities closely monitor the changing values and external expectations of the broader system in which they participate. They engage with external stakeholders and map out the potential change in the discourse of values and expectations. Further, they try to identify if there is congruence between the two value systems. If not, universities either prefer to adapt and incorporate the changing values (starting the organizational legitimacy process) or attempt to alter the values of the superordinate social system (promulgating their own legitimacy process). When universities prefer the former, the second phase is put in motion. As for the latter option, there is a leap directly towards the third phase.

Phase 2: Building the legitimacy process

Upon the identification of nonconformity in the two value systems, and the taking of a decision preferring the implementation of the former option, universities communicate the argument for adaptation to their members. Furthermore, they initiate organizational arrangements, which would allow the members to exercise the proper actions anticipated of them. In other words, organizational change commences.

Phase 3: Completion of organizational change and the dissemination of the legitimacy process

This phase involves the finalization of a series of internal arrangements in universities regarding the adaptation to the changing external environment and value systems. Organizational change is completed and the legitimacy process, to a large extent, is established. There is one last step moving forward; the dissemination of this process to external stakeholders. Universities convey the message that they can adapt to changing values and expectations and that they have taken the necessary steps to do so via several means of communication. In case of the latter, universities do not necessarily undergo a process of organizational change; rather, they disseminate the significance of their values to alter the superordinate social system and its expectations. In this scenario, legitimacy is completed when external stakeholders finally recognize the values of universities and their relevance in the broader social system.

DATA AND METHODS

The research reported here has adopted a qualitative exploratory case study design. Case studies are necessary when the intention of the research is to explore a certain phenomenon on a deeper level and gain a better understanding of its ramifications (Stake, 1995). The University of Twente (UT), a public university in the Netherlands, was selected as a case. What makes the UT an interesting case is its long commitment to the development of its region since its establishment and efforts to reach out to society. Realizing the prevalence of grand societal challenges, particularly in the last decade, the UT has been searching for ways to mobilize its resources when tackling these challenges. It is the serious commitment and dynamism that has been going on there for some time and its targeted contributions to the socioeconomic development of its geographical vicinities that facilitates the UT to be dwelled on as a case study.

To gather accurate and insightful data, criterion sampling was administered. In this regard, the research had two prearranged criteria in selecting the samples:

- Participants would have experience (academic, managerial or practical level) in either social entrepreneurship or higher education, or both. Academic experience refers to publications on social entrepreneurship and/or higher education studies, while managerial and practical experience corresponds to being part of the university management team and/or being social entrepreneurs/leading social entrepreneurship initiatives, respectively. Moreover, the focus of social entrepreneurship initiatives range from refugee entrepreneurship to cost-effective organic farming and the reduction of the generational divide in citizen engagement.
- Participants would have been working or studying in the UT for at least one full academic year. The reason being that this might allow individuals to observe the institutional environment for both semesters, become familiar with organizational culture and thus make better judgments.

An interview document, which consisted of 13 semi-structured questions, was sent to two experts (academics) in the field. Upon receiving feedback, the interview document was revised, and the potential informants were contacted. Seventeen interviews with individuals such as academics, executive board members and social entrepreneurs (academics/students) were conducted between December 2017 and January 2018. Descriptive information regarding the interviews and interviewee characteristics are outlined in Table 1.

Each interview was tailored to the professional background and experience of the participant. Interviews were recorded, transcribed and analyzed thematically (Fereday & Muir-Cochrane, 2006).

THE CASE: UNIVERSITY OF TWENTE IN THE TWENTE REGION, THE NETHERLANDS

The Twente region is an area in the eastern Netherlands, part of Overijssel province, bordering Germany. It comprises of 14 municipalities with Enschede, Hengelo and Almelo being the

Table 1. Interviews and interviewee characteristics.

Informant characteristics	Academic staff: 9; administrative staff: 6; students: 2
Number of years in the University of Twente	1–4 years: 4; 5–9 years: 6; 10–19 years: 3; 20–29 years: 2; ≥ 30 years: 2
Relevant experience	Academic: 7; managerial: 5; practical: 5
Interview duration	Minimum: 37 min; maximum: 73 min
Gender	Male: 12; female: 5

major cities with a considerable size of rural hinterland. It hosts 3.6% of the Dutch population (approximately 626,500 inhabitants). Since the demise of the textile industry in the 1960s, the unemployment rate in the region has generally been higher than the national average. Considering all the relevant socioeconomic indicators, Twente can be characterized as a peripheral region (Benneworth & Pinheiro, 2017) (Figure 1).

Established in the 1961, post the decline of textile industry, the UT is one of the four technical universities in the country. Located in Enschede in Overijssel province, the UT originally set off on its journey with the hope of contributing to its region economically. Starting off as the Technische Hogeschol Twente, primarily a technical applied university, it later gained full university status around the mid-1980s. Beginning the journey with an entrepreneurial mindset, the UT placed paramount importance on the valorization of knowledge, generating over 1000 spin-off companies since 1984, thereby contributing to the socioeconomic development of the Twente region, mostly, but not limited to, the cities of Enschede and Hengelo. It employs 3074 academic and administrative staff (including doctoral students employed by the university) and enrols 10,435 students as of 2017. As far as social entrepreneurship is concerned, the UT is involved in Novel-T, formerly known as Kennispark – an incubation and acceleration centre for start-ups – and Design Lab – a creative and interdisciplinary centre that encourages UT members (both students and academic/administrative staff) to work together to develop scientific ideas, later to be implemented for addressing complex societal challenges. Furthermore, the UT hosts the PC3 (Product Co-Creation Centre for Bottom of the Pyramid) initiative, which facilitates the interaction of novice social entrepreneurs with specialists in the field for the co-creation of products, and VentureLab, which offers business development programmes for technology-based start-ups. These centres and initiatives are platforms through which social entrepreneurship, mostly commercial based (start-ups with a social purpose), takes place.

Figure 1. Geographical location of the Twente region in relation to the Netherlands and Europe. Source: ITC (2005) (courtesy: Faculty of ITC, University of Twente).

RESULTS

This section entails a number of factors affecting the legitimacy process of social entrepreneurship within a higher education context, and a preliminary discussion in relation to them. The factors that impact the legitimacy process of social entrepreneurship are as follows:

- Expectations of external stakeholders, the difficulty of measuring social impact and third-mission indicators.
- Overemphasis on high-tech research and application.
- Absence of a leader in the field and organizational recognition in the UT.
- Stringent regulations of public institutions in the Netherlands.
- Lack of place-based belonging among student body, a barrier to fostering social entrepreneurs.

The factors are further elaborated upon in the following section.

Expectation of external stakeholders, difficulty in measuring social impact and third-mission indicators

Five primary actors constitute the superordinate social system of the UT: the cities of Enschede and Hengelo, the Twente region with its administrative bodies – Regio Twente, Overijssel province, the Dutch government and the European Commission. Among these, the municipality of Enschede, the Twente region and the Dutch government can be considered as stakeholders, forming the biggest segment of the UT's superordinate social system. These actors expect the UT to contribute to its region socially and economically; however, they deem these outputs measurable. More specifically, they expect a short-term and immediate outcome of the UT's actions that is quantifiable in socioeconomic terms, as perceived by the UT members. The narrative of an academic staff mirrors the commonly shared perception in the UT: 'Everybody outside, the municipality (Enschede), the province or the government. … They want something tangible. Something they can see and that can be observed in numbers like jobs, start-ups or money generated' (Academic staff, 2).

In addition, indicators aiming to evaluate third-mission activities of higher education institutions are rather biased towards economic and quantifiable outputs such as the number of licences granted, number of patent applications, spin-offs, research contracts and companies in incubators, revenue of external income, etc. The indicators certainly undermine the impact of certain disciplines, particularly in the social sciences and humanities. For instance, indicators value the amount of income a university receives whilst conducting research, but some disciplines within the social sciences and humanities are less costly compared with life and engineering sciences as they may require less equipment. This reinforces the perception that the level of income mirrors impact, which can be highly misleading (Rossi & Rosli, 2014). The indicators not only fail in reflecting the full picture of third-mission activities but also lead to the incentivization of certain types of behaviours among faculty members.

The lack of an efficient measurement of social impact and value further prompts the UT to canalize its members' efforts towards quantifiable third-mission practices, such as the creation of start-ups and spin-offs, patenting and licensing, rather than towards social entrepreneurship. An academic staff expressed it as follows: 'Of course you are free to contribute to it (social entrepreneurship) but sooner or later you will realize it does not have an impact on your career. Rather, industry income, establishing start-ups and spinoffs has' (Academic staff, 4). Unlike the outcome of social entrepreneurship, in many cases it is possible to quantify the effects of start-ups, spin-offs, patenting and licensing by simply indicating the number of these activities, the revenue they

generate and the jobs they create in a given period. To illustrate, a social entrepreneurship initiative that entails gathering senior citizens and university students to discuss the challenges pertaining to the place in which they live, and form a new coordination mechanism to address these challenges, may have considerable positive effects on narrowing the generational gap and age-related social issues in the Netherlands. Nonetheless, as the positive effect is neither quantifiable nor fully measurable, this particular initiative is unlikely to take place within the higher education setting of the UT. Recognizing incentivization of certain types of third-mission activities, a senior administrative staff further explains why enhancing social entrepreneurship has not yet been a proper action (Scott, 2008):

> Well, there are a number of reasons why we [the UT] have not been able to invest more in that issue (social entrepreneurship), particularly when the outside world expects you to deliver immediate, financially measurable ventures in the city [Enschede]. They just want to have as many start-ups as possible in Enschede. Previously, they were concerned that some successful ones such as Booking.com were moving to the west of the country but now they are not concerned with this anymore. They demand and expect a circulation of ventures. Some will go, the new ones will be created and that is just fine for them, which is another debate in itself. (Administrative staff, 11)

Expectation of external stakeholders, difficulty in measuring social impact and third-mission indicators are three related factors that negatively affect the legitimacy process of social entrepreneurship within the higher education context. There exists a path dependency among them. Since there is a lack of an effective measurement for social impact, and third-mission indicators do not reflect the full spectrum of activities, external stakeholders have expectations geared towards quantifiable outcomes from universities. Similarly, since the superordinate social system expects quantifiable outcomes, the UT canalizes its members' efforts to third-mission activities that focus largely on the commercial value of research, pushing social entrepreneurship to the margin of the organizational agenda. These findings indicate a need for a framework on how to measure and/or disseminate social impact (Mulgan, 2010).

Overemphasis on high-tech research and application

As mentioned above, the UT is one of the four technical universities in the Netherlands. The findings suggest that there exists a narrative of rivalry, although not a very robust one, between the UT and the other three technical universities inside the organization. Nevertheless, this narrative impels the UT to take actions that will preferably distinguish it from the other three universities by investing in new academic niches, incorporating high-end tech and increasing the quality of existing research areas. Surprisingly, the UT is determined to differentiate itself from the others by increasing the emphasis on high-tech related fields, as stated by a senior staff:

> If you are a technical university, you need to do what technical universities do. If you want to survive in this competitive environment [technical universities], you need to differentiate yourself. Investing in high tech is a strategy, differentiating factor for us. With this, we spread the message that if you want to focus on any high-tech related field in the Netherlands, University of Twente is the place you should choose. (Administrative staff, 14)

This strategy is striking considering that research, development and implementation of high-tech is already an area in which the other three technical universities have heavily invested.

This focus is also exacerbated by the will of an external stakeholder, the Enschede municipality in this case, to transform the city into a regional high-tech hub. Accumulation of these factors urged the UT to concentrate on strengthening this particular field as a research area and encouraged its academic staff, including those in the social sciences and humanities, to frame their

research accordingly. For instance; a faculty member in the philosophy department is expected to specialize on the philosophy of digital technologies. A social scientist in public administration is expected primarily to specialize in the role of digital technologies in public governance. A psychologist is anticipated to conduct research in the field of robot–human interaction. Nevertheless, the discontent about the framing of research interests in relation to high-tech among the academic staff has grown, as exemplified by following:

> To be honest, I am a bit tired and concerned at the same time about the university demanding that we should frame our research in line with high-tech. There is so much emphasis on high-tech. We have several social challenges in the Netherlands of which solutions do not necessarily entail any kind of high-tech application. What if I come up with such an idea? Nothing much happens because it does not fulfil the interest of the UT. (Academic staff, 9)

The academic staff is not the only group expected to frame their interests in relation to high-tech. Students also experience it in different ways.

> We started a project to empower local people working in agriculture sector both in the Netherlands and Colombia. In the beginning, the project was progressing gradually, you know … when you start a project everything becomes clear slowly afterwards. After some weeks UT started to check if we embed high-tech in our project. We did not because we did not need it. After some months when it became clear that this project does not involve any kind of high-tech applications in the process, the support started to fade away gradually. (Student, 16)
>
> I am a third-year psychology student and it took me three years to finally find my place in this university. I think it [the emphasis on high tech] is really overwhelming. We [psychology students] constantly question our role, our place in this university. That is so sad because there is so much psychologist can do for the people here [the UT] and outside [the region]. (Student, 17)

The above demonstrates that the concentration on the development and application of high-tech has also been incorporated into student projects and initiatives. An overemphasis on this impacts social entrepreneurship in two ways: (1) any social entrepreneurship initiative that does not entail a high-tech dimension receives little to no support, regardless of its benefits for the locals; and (2) the societal challenges the region faces receives little attention inside the UT when the use of high-tech is not part of the solution. Thus, the potential of the academic and student body in contributing to solving grand challenges via social entrepreneurship remains unexplored.

Absence of a leader in the field and organizational recognition

Social entrepreneurship as a research field does exist in the UT, particularly in the NIKOS academic centre (Netherlands Institute for Knowledge Intensive Entrepreneurship); however, only a handful of researchers affiliated with the centre focus on it. Interviewees frequently touched upon the necessity of social scientists who devote a vast portion of their research career to social entrepreneurship. Findings indicate that social scientists with academic expertise, mostly in social entrepreneurship, are fundamental for two reasons: (1) to have a product champion(s) who would lead the development of social entrepreneurship; and (2) consolidate it as a research field within the UT. Current efforts of academics focusing on social entrepreneurship are rather fragmented. Among a handful of those researchers, some are affiliated with more than one university, therefore allocating a significant period of time to another institution while some others simply reside outside the Twente region or the Netherlands. The following statement of an interviewee epitomizes the situation in the UT:

> What we are missing here is a leader in social entrepreneurship. There is no product champion at the moment. The ones we have are either very limitedly connected to this university or live elsewhere. That is a pity. This is why I say the first thing I think to do here is to attract a professor on social entrepreneurship or somebody who likes social entrepreneurship quite a lot and leads the process. I talked to rectors and also chairman of the board. They are absolutely not against it, but they are not a product champion, and you need a product champion. (Administrative staff, 10)

Informants also base the need for a product champion for social entrepreneurship on the history of organizational developments in the UT, as articulated by a faculty member: 'The problem is that we do not have a Van den Kroonenberg (the rector who championed the entrepreneurial university model in 1980s) for social entrepreneurship' (Academic staff, 5) – pointing to the significance of endogenous leadership that has manifested itself in organizational developments throughout the history of the UT.

Another dimension that has constantly been of focus in terms of this particular theme is the lack of attention devoted to existing social entrepreneurs (academic and administrative staff, and students) in the UT. There is a consensus that the UT has not placed enough emphasis on successful social entrepreneurs who are, in some way, affiliated to the university through various media outlets, such as the independent journalistic medium of U-Today – campus-based, local newspapers, official Facebook and Twitter pages, and YouTube channels: 'When there is a student starting a company, he or she is all over the place. In the website, Facebook, newspapers. When we [students] work in these [social entrepreneurship initiatives], we do not get any attention' (Student, 16). This can be interpreted as a consequence of social entrepreneurship not yet being legitimized inside the UT, postulated by various media outlets (Deephouse & Suchman, 2008).

Stringent regulations of public institutions

One of the most frequently highlighted issues in the interviews was the fact that public institutions in the Netherlands have miscellaneous internal regulations and occasionally contrasting organizational interests, making inter-institutional collaborations even more challenging. The working schedule of faculty members in the UT is one such regulation that limits the room for engaging in third-mission activities that do not generate any income. Faculty members are to fill out a weekly timetable stating the areas in which they spent their time working. The time allocated for third-mission activities that do not necessarily generate any income is rather limited. Considering that social entrepreneurship requires a collaboration mechanism of various sectors, agents and institutions, which is a time-consuming process, faculty members can only allocate a limited number of hours to work for social entrepreneurship projects: 'First of all, how will you arrange your time sheets? This is not something that generates income so how many hours will you be able to dedicate, and more importantly will it be allowed by your department?' (Academic staff, 8).

Another participant reflected on organizational flexibility in public institutions in the Netherlands:

> The biggest barrier [to enhancing social entrepreneurship] is traditional organizations and professionals who have to look after their responsibility to make sure that everything is organized and absolutely in line with internal regulations. That is the biggest hindrance. And the fact that we have organized everything so perfectly in the Netherlands that we think, from working schedules to employee expertise and more, makes the new initiatives extremely hard to realize. (Administrative staff, 15)

Relatively restrictive internal regulations alike can be encountered in other public institutions that prevent employees from devoting a significant period of time to collaborative, social

entrepreneurship projects, as claimed by an UT employee: 'We worked with them [employees in municipalities]. They also have problems when they spend time in projects with us because their job descriptions can be very strict' (Academic staff, 3). Although one might infer this to be an issue regarding employee flexibility, the nature of the abovementioned challenges should be considered as a lack of organizational flexibility (Skorstad & Ramsdal, 2016). It is further constrained when public institutions do not see any positive political reciprocity in social entrepreneurship initiatives, particularly when they feel that the continuation of their political mandate is at risk.

Lack of place-based belonging

One last factor that does not necessarily impact the legitimacy of social entrepreneurship in the UT but makes its manifestation among the student body relatively difficult is the lack of place-based belonging to the region. The UT is located between the cities of Enschede and Hengelo, approximately 5 km from each city, and it has a full campus where almost all faculties, research centres and student facilities are located. Interviewees stated that the interaction of students with these two cities is limited: 'It is technically possible to live here without having to go to the city throughout your studies. This is not myth. I know people who have finished their studies and been to city only once or twice' (Student, 17). Students do not engage much with the region or the local people, leading to a lack of place-based identity formation and a sense of belonging (Benson & Jackson, 2012; Scannell & Gifford, 2010):

> Our students come from all over Netherlands and the world. You cannot expect them to be enthusiastic in these [social entrepreneurship initiatives] when they do not know much about local people and their challenges. Unfortunately, their interaction is very limited. (Academic staff, 7)

This is significant in the fostering of social entrepreneurship if the aim is local impact for two reasons: (1) social entrepreneurs need to develop a deep understanding of the region in which a particular social issue is observed, and its socio-political conditions; and (2) social entrepreneurs should sympathize with a particular segment of society that suffers from a social issue to develop initiatives targeting solutions and social change (Dees, 1998).

To sum up, the findings demonstrate that social entrepreneurship has been pushed to the margins of organizational agenda in the UT due to various reasons. It has only been found to be relevant when the endeavour entails the establishment of a start-up, encompassing a mission of creating social value, somehow incorporating the use of high-tech. As for fostering social entrepreneurs among the student body, their limited interaction with the region and its actors makes this rather difficult.

DISCUSSION AND CONCLUSIONS

This paper has sought to shed a light on the factors affecting the legitimacy of social entrepreneurship in the UT. The findings suggest that a number of factors hinder this process. Based on these factors, the legitimacy process for social entrepreneurship remains unestablished. As a matter of choice, the UT has attempted to garner legitimacy for a rather limited form of social entrepreneurship, which entails encouraging the establishment of start-ups that have a social mission, indicating isomorphism and decoupling (Boxenbaum & Jonsson, 2008) surrounding the practice of subject matter. This decision is in line with the expectation of external stakeholders, therefore suggesting congruence between its values and the superordinate system to which it belongs (Dowling & Pfeffer, 1975).

Although the municipality (Enschede), the provincial government (Overijsel), the Dutch government and the European Commission expect the UT to contribute to the social and economic development of its region (as perceived by the UT), the demand for quantifiable and

economic outcomes and assistance in transforming the region into a high-tech hub outstrips the social expectation. In other words, while economic expectations from the UT have long been clear (i.e., generating start-ups and spin-offs, creation of jobs via these, etc.), the social expectations are rather fuzzy, leaving room for dozens of interpretations. How does a university have a social impact on its region? Is it by enhancing social entrepreneurship, community engagement and industry collaboration or preparing the students for future jobs? In the midst of all these possibilities, the UT has decided to prioritize economic expectations in a quantifiable manner and argue its social impact through positive externalities of economic outcomes (i.e., jobs created in the region via start-ups), thereby seeking congruence between its own and the stakeholders' values to survive (Dowling & Pfeffer, 1975; Maurer, 1971). Consequently, social entrepreneurship has not been promoted as one of the 'proper actions' in the university (Scott, 2008). Actors perceive this template through the cultural–cognitive pillar of the UT whereby they realize that enhancing social entrepreneurship is not a 'comprehensible, recognizable, culturally supported' behaviour (Scott, 2008, p. 60).

With regard to the three phases of the legitimacy framework provided above, the first phase has taken place, though not necessarily for social entrepreneurship. More specifically, the expectation from external stakeholders lies mainly in three areas: to contribute to its region socioeconomically, to transform the region into a high-tech hub and to address grand social challenges. The first two were found to have significantly higher influence. In addition, the UT argues that by focusing on the first and second expectations, it is already addressing grand challenges. As such, there was no value conflict between the superordinate social system and the organizational values of the UT, particularly reinforced by those who are in the steering (university governance) positions, since they also share similar views. Thus, the first phase of the legitimacy process is completed, without much value conflict and a further leap to the second and third phases.

The implications drawn from this particular case are manifold.

- Pattern of triggering institutional change in response to the expectations of the external environment can be historically contingent (Thornton & Ocasio, 2008). More specifically, significant institutional change processes were realized through the great efforts of strong, key individuals throughout the history of the UT, as is the case with former rector Harry Van den Kroonenberg who championed the entrepreneurial university model. It appears that this has become a tradition in the university. As such, it can be argued that if similar institutions are to contribute to social entrepreneurship, a prominent figure who can make the case and lead the processes becomes essential (Bolman & Deal, 2017).
- If social entrepreneurship is expected to be enhanced by universities and other public institutions, the importance of organizational legitimacy should not be underestimated. To assist in constructing it, there are several roles external stakeholders (institutions and policy-makers) must assume. Upon clarifying expectations with respect to the social impact of universities, policy-makers should also design appropriate strategies, such as incentive systems, funding mechanisms, embracing the often underestimated, unmeasurable or hard-to-gauge impacts, work flexibility of the employees of a region and focus on regionally relevant science that would help universities fulfil these expectations. In this regard, universities should not be left alone.
- Universities' contributions to social entrepreneurship should be addressed holistically. This requires a focus and analysis of the increasingly competitive environment within which they function (Hazelkorn, 2011). This environment has urged the UT to construct an organizational identity based on competitiveness, rivalry and differentiation due to the metrification of academia, evaluation systems and research funding regimes. Without it, perhaps the construction of an organizational identity that is also based on regional alignment would be possible.

- Whenever a university's enhancement of social entrepreneurship is discussed, students usually receive the attention and are seen as the potential agents of change (Pache & Chowdhury, 2012). However, challenges emerge for campus universities located relatively far from cities, where students have little or no interaction with the region. Such universities should aim at designing an organizational environment that will foster university-region interactions at all levels. Designing courses regarding the characteristics of the regions, planning some of the academic and social events with local residents of the cities, and aligning student projects with regional needs are some instances. Initiatives should go beyond enabling only a small segment of students to undertake internships and should incorporate university–region interaction into teaching and research (Goddard et al., 2016).

In addition to filling the empirical gap that exists in legitimacy studies, with most scholarship being highly theoretical (Deephouse & Suchman, 2008), this study also points to new research avenues. A study exploring institutional logics (with respect to social entrepreneurship) occupying the organizational field, in a given region composed of several actors, is highly recommended. Such a study will likely provide academics and policy-makers with a holistic glimpse into the state of social entrepreneurship.

ACKNOWLEDGEMENTS

The author thanks Dr. David Charles (Northumbria University), Dr. Anna Kosmutzky (Leibniz University Hannover) Dr. Paul Benneworth (Western Norway University of Applied Sciences & University of Twente), Dr. Helena Aittola (University of Jyvaskyla) and two anonymous reviewers for their constructive feedback on earlier version of this paper.

FUNDING

The author acknowledge that the paper was supported by funding from the European Commission's Horizon 2020 Research and Innovation Programme (Marie Sklodowska-Curie Actions) grant agreement No: 722295.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author.

ORCID

Ridvan Cinar http://orcid.org/0000-0002-5640-224X

REFERENCES

Alvord, S. H., Brown, L. D., & Letts, C. W. (2004). Social entrepreneurship and societal transformation. *Journal of Applied Behavioral Science*, *40*(3), 260–282. doi:10.1177/0021886304266847

Arbo, P., & Benneworth, P. (2007). *Understanding the regional contribution of higher education institutions: A literature review. OECD Directorate for Education, Working Paper No.* 9(1). doi:10.1787/161208155312

Benneworth, P., & Cunha, J. (2015). Universities' contributions to social innovation: Reflections in theory & practice. *European Journal of Innovation Management*, *18*(4), 508–527. doi:10.1108/EJIM-10-2013-0099

Benneworth, P., & Pinheiro, R. (2017). Involving universities in regional upgrading in the periphery: Lessons from Northern Europe. *Advances in Spatial Science*, 299–321. doi:10.1007/978-3-319-49818-8_13

Benson, M., & Jackson, E. (2012). Place-making and place maintenance: Performativity, place and belonging among middle classes. *Sociology*, *47*(4), 793–809.

Bolman, G. L., & Deal, E. T. (2017). *Reframing organizations: Artistry, choice and leadership*. NJ: Jossey-Bass.

Boxenbaum, E., & Jonsson, S. (2008). Isomorphism, diffusion and decoupling. In R. Greenwood, R. Suddaby, C. Oliver, & K. Sahlin-Anderson (Eds.), *Handbook of Organizational Institutionalism* (pp. 78–98). New York, NY: Sage.

Choi, N., & Majumdar, S. (2014). Social entrepreneurship as an essentially contested concept: Opening a new avenue for systematic future research. *Journal of Business Venturing*, *29*(3), 363–376. doi:10.1016/j.jbusvent.2013.05.001

Cunha, J., Benneworth, P., & Oliveira, P. (2015). Social entrepreneurship and social innovation: A conceptual distinction. In *Handbook of research on global competitive advantage through innovation and entrepreneurship* (pp. 616–669). doi:10.4018/978-1-4666-8348-8.ch033

D'Andarade, R. (1984). Cultural meaning systems. In R. A. Schweder, & R. A. LeVine (Eds.), *Culture theory: Essays on mind, self and emotion* (pp. 88–119). Cambridge: Cambridge University Press.

Deephouse, L. D., & Suchman, M. (2008). Legitimacy in organisational institutionalism. In R. Greenwood, C. Oliver, B. T. Lawrence, & R. E. Meyer (Eds.), *The Sage handbook of organizational institutionalism* (pp. 49–77). New York: Sage.

Dees, J. G. (1998). The meaning of social entrepreneurship. *Innovation*, *2006*(11–4–06), 1–6. doi:10.2307/2261721

DiMaggio, P. J., & Powell, W. W. (1991). The new institutionalism in organizational analysis: Introduction. In *The new institutionalism in organizational analysis* (pp. 1–38). Retrieved from http://search.epnet.com/login.aspx?direct=true&AuthType=cookie,ip,url,uid&db=ecn&an=0336731

Dowling, J., & Pfeffer, J. (1975). Organizational legitimacy: Social values and organizational behavior. *Pacific Sociological Review*, *18*(1), 122–136. doi:10.2307/1388226

European Commission. (2013). Entrepreneurship 2020 action plan: Reigniting the spirit of entrepreneurship in Europe. *COM*, *2012*, 795. Final. Brussels, Belgium.

Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*. doi:10.1177/160940690600500107

Goddard, J., Hazelkorn, E., Kempton, L., & Vallance, P. (2016). *The civic university: The policy and leadership challenges*. Cheltenham, MA: Edgar Edward.

Gray, E. (2012). For-profit social entrepreneurship. In T. S. Lyons (Ed.), *Social entrepreneurship: How businesses can transform society* (pp. 47–70). CA: ABC–CLIO.

Hazelkorn, E. (2011). *Rankings and the reshaping of higher education: The battle for world-class excellence*. doi:10.1057/9780230306394

Johnson, C., Dowd, T. J., & Ridgeway, C. L. (2006). Legitimacy as a social process. *Annual Review of Sociology*, *32*, 53–78.

Laredo, P. (2007). Revisiting the third mission of universities: Toward a renewed categorization of university activities. *Higher Education Policy*, *20*(4), 441–456.

Leadbeater, C. (1997). *The rise of the social entrepreneur*. London: Demos.

Maurer, J. G. (1971). *Readings in organizational theory: Open system approaches*. New York, NY: Random House.

Mulgan, G. (2010). Measuring social value. *Stanford Social Innovation Review* (Summer), 38–43. doi:10.1257/aer.97.2.433

Nicholls, A. (ed.). (2006). *Social entrepreneurship: New models of sustainable social change*. Oxford: Oxford University Press. doi:10.1017/CBO9781107415324.004

O'Kane, C., Mangematin, V., Geoghegan, W., & Fitzgerald, C. (2015). University technology transfer offices: The search for identity to build legitimacy. *Research Policy*, *44*(2), 421–437. doi:10.1016/j.respol.2014.08.003

Pache, A., & Chowdhury, I. (2012). Social entrepreneurs as institutionally embedded entrepreneurs. Toward a new model of social entrepreneurship education. *Academy of Management Learning and Education*, *11*(*3*), 494–510.

Perrow, C. (1970). Perspectives on organizations. In *Organizational analysis: A sociological view* (pp. 1–26). Belmont, CA: Wadsworth Publishing.

Powell, W. W., & Bromley, P. (2015). New institutionalism in the analysis of complex organizations. In *International encyclopedia of the social & behavioral sciences* (pp. 764–769). doi:10.1016/B978-0-08-097086-8.32181-X

Rossi, F., & Rosli, A. (2014). Indicators of university–industry knowledge transfer performance and their implications for universities: Evidence from the United Kingdom. *Studies in Higher Education*, *40*(10), 1970–1991. doi:10.1080/03075079.2014.914914

Scannell, L., & Gifford, R. (2010). Defining place attachment: A tripartile organizing framework. *Journal of Environmental Psychology*, *30*, 1–10.

Scott, W. R. (2008). Crafting an analytical framework: Three pillars of institutions. In W. R. Scott (Ed.), *Institutions and organizations* (pp. 55–85). London: Sage.

Seelos, C., & Mair, J. (2005). Social entrepreneurship: Creating new business models to serve the poor. *Business Horizons*, *48*(3), 241–246. doi:10.1016/j.bushor.2004.11.006

Selznick, P. (1957). *Leadership in Administration*. New York, NY: Harper & Row.

Shintani, D. (2011). The role of business actor for social innovation from CRS perspectives. In *Fostering innovation to address social challenges* (pp. 65–68). Paris: Organisation for Economic Co-operation and Development (OECD).

Skorstad, J., & Ramsdal, H. (2016). *Flexible organizations and the new working life*. London: Routledge.

Stake, R. (1995). *The art of case study research*. Thousand Oaks, CA: Sage. doi:10.1108/eb024859

Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, *20*, 571–610.

Thornton, P. H., & Ocasio, W. (2008). Institutional logics. In *The Sage handbook of organizational institutionalism* (pp. 99–129). London: Sage.

Uyarra, E. (2010). Conceptualizing the regional roles of universities: Implications and contradictions. *European Planning Studies*, *18*(8), 1227–1246.

sustainability

MDPI

Article

Structuration of Natural Resource-Based Innovations in Universities: How Do They Get Institutionalized?

Ridvan Cinar

Department of Social, Political and Territorial Sciences, University of Aveiro, 3810-193 Aveiro, Portugal; rcinar@ua.pt

Received: 20 December 2019; Accepted: 26 February 2020; Published: 29 February 2020

Abstract: Natural resource-based innovations (NRBIs), especially through the valorization of waste and side streams, have recently become a significant element of the bioeconomy agenda in several countries across the world. Accordingly, a variety of institutions, including universities, have been expected to contribute to such innovations. While there have been serious efforts within universities to play a key role in NRBIs, questions of the extent of institutional continuity of these efforts over time and how this can be achieved remain unanswered in the literature. This paper, therefore, seeks to identify the determinants of a highly institutionalized structure that is supportive of NRBIs in universities. By mobilizing a literature in which the level of structuration is conceptualized as the degree of institutionalization and by using a single case study of a Portuguese public university, it was found that several internal and external factors have contributed to the institutionalization process, which has led to the emergence of a sedimented structure. Despite a high degree of institutionalization, several challenges that have either impeded the harnessing of the full potential of NRBIs or that have posed a threat to the university's highly institutionalized structure were also found. The paper concludes that the institutionalization of NRBIs within universities not only requires orchestrated organizational efforts but also more consideration of the social, economic, and political dynamics that have recently engulfed universities.

Keywords: bioeconomy; universities; natural resources; innovation; institutionalization; level of structuration

1. Introduction

Resource scarcity due to climate change and population increase has become a major problem in the world over the past few decades [1]. It has become rather difficult to access natural resources, and this, in turn, has rendered their more sustainable and effective use necessary. Bioeconomy has thus experienced a heightened emphasis, and many countries have started to search for innovative ways to valorize already existing natural resources and generate new products. Natural resource-based innovations (NRBIs) have likewise become a highly significant part of the European Commission's innovation agenda [2].

Similar to innovation in other fields, innovation in the bioeconomy sector requires knowledge. Universities have therefore been expected to mobilize their knowledge capacity to spur innovation in the bioeconomy sector [3]. In response to such demands, serious efforts toward propagating bioeconomy activities have recently been observed in European higher education institutions. For instance, six universities have joined forces to intensify their cooperation within the field under a new initiative, entitled the European Bioeconomy University (EBU) (The EBU is an initiative in which six leading European universities (Hohenheim (Germany), Bologna (Italy), Eastern Finland (Finland), AgroParisTech (France), Boku Vienna (Austria), and Wageningen (the Netherlands)) that are strong in the area of bioeconomy are expected to intensify collaboration on research, teaching, and the

valorization of biobased resources). Several other universities have also designed master programs in bioeconomy and have encouraged research, commercialization, and innovation in the sector [4]. While such initiatives are promising, questions of the extent of institutional continuity in these efforts over time and how this can be achieved within universities remain unanswered in the literature.

The bioeconomy literature regards universities as significant actors that can generate NRBIs and make important contributions [5–9], without a specific focus on how such activities function within university settings and how they get institutionalized. The higher education literature, on the other hand, situates NRBIs within the broader sustainable development framework [10–15], leaving out sufficient elaboration on their particularities. This paper thus aims to contribute to the debates regarding the involvement of universities in bioeconomy and bridge these currently disconnected fields. The following research question is asked: How do natural resource-based innovations get institutionalized within universities, and what are the factors contributing to their high degree of institutionalization? The literature around institutional theory that conceptualizes the *level of structuration* as the *degree of institutionalization* is used in the next section in order to answer this question. Delving deep into the exploratory nature of the research, the paper then focuses on a case study of a public university in Portugal, the University of Aveiro (UA), which is very active in engaging with bioeconomy. In the following sections, the paper then sheds light on the specificities of some NRBIs and the institutionalization process. The analysis demonstrates that it takes relatively a long time and an accumulation of targeted actions to build a sedimented structure supportive of NRBIs within universities. Moreover, there are several internal and external factors that have contributed to this process by providing legitimacy, encouraging potential adaptors, and mobilizing resources, all of which is described in Section 4. Despite the high degree of institutionalization, it is argued that there are two types of challenges that individual actors who lead such innovations face: (a) regulatory and practice-level challenges that make harnessing the full potential of NRBIs somewhat difficult and (b) systemic challenges that seem to be more serious and pose a risk of deinstitutionalization, albeit not in the very immediate future. Finally, the paper concludes that the institutionalization of such innovations within universities requires not only internal orchestrated organizational efforts, but also more consideration of the social, economic, and political dynamics that have recently engulfed universities.

2. Theoretical Framework

Universities are traditionally characterized as loosely coupled organizations that involve diverse academic units and groups [16,17]. For a new practice to be institutionalized, there needs to be an established organizational legitimacy, an appropriate value system [18,19], resource mobilization [20], and cultural–cognitive beliefs [21,22], and these should be supported by taken for granted assumptions [23]. The degree of institutionalization of NRBIs in universities then depends on the extent to which such activities are backed by these organizational aspects and the extent to which they are structured. With its holistic approach to organizational fields and the mediation between structure and agency [24,25], institutional theory provides a theoretical lens and terminology with which to analyze the institutionalization of NRBIs in universities.

Zucker (1977, p. 726) defines institutionalization as "a variable with different degrees of institutionalization altering the cultural persistence, which can be expected". The institutionalization of new practices is not always manifested with equal intensity: institutionalization has degrees, and thus different phases. Barley and Tolbert (1997) argue that the difference stems from two sources: (a) the age of an institution and the time span of a given new practice and (b) the extent to which the new practice is accepted by different groups. Institutions (and structures) that have a long history and that have gained legitimacy, as well as extensive acceptance, by other actors in the field are more stable and harder to deinstitutionalize [26]. Institutional theorists have cross-fertilized arguments on institutionalization [22,26,27], drawing on insights from structuration theory, which focuses on the creation and continuity of social systems, such as structures [28,29]. One outcome of this synthesis is

that "institutionalization is a process of structuration, and the terms can be used synonymously" [30] (p. 775).

Tolbert and Zucker (1999) identify three stages of institutionalization: *habitualization*, *objectification*, and *sedimentation*. Each phase represents different degrees of institutionalization. The first stage, *habitualization*, is the stage in which a new practice is introduced into the field by a relatively small number of members and achieves a degree of habitualized behavior. In this phase, the new practice is an independent activity and not well coordinated. There is no deeply shared value system surrounding it and no established agreement as to its continuation. Adoption of the new practice by other actors in the field is minimal. Such structures are temporary and not very stable, and they usually fade away over time [31].

The second stage of institutionalization is *objectification*. This stage includes some sort of consensus around the new practice and a growing adoption of it by actors in the field [31]. On the basis of this consensus, it can be expected that the actors who adopt the new practice have a vested interest in it ultimately becoming more heterogeneous. Such structures are usually more permanent, and they can be more stable, provided that there are external and internal conditions legitimating them, the discourse around them is high, and there is a significant level of resource mobilization as well as intergroup alliances [31].

Sedimentation is the last phase of institutionalization. It is defined as follows:

> " ... a process that fundamentally rests on the historical continuity of a structure and, especially, on its survival across generations of organizational members. Sedimentation is characterized both by the virtually complete spread of structures across the group of actors theorized as appropriate adopters and by the perpetuation of structures over a lengthy period of time". [31] (p. 184)

In this phase, there is an extensive consensus around the new practice, its benefits, and its functionality. There are different groups who have some sort of interest in keeping the new practice, as well as in mobilizing their resources and triggering organizational dynamics to maintain it. Resistance from opposing groups is rather minimal or nonexistent, and it is frequently taken for granted. Such structures are quite stable, have a great influence on actors, and are normally hard to deinstitutionalize [31].

This perspective posits that the strength of structures depends on whether collective rationality and interests move from values and intentions to concrete exercises, such as organizations, laws, technologies, and funding allocations [32]. Depending on the specificities of such exercises, some organizational fields entail sedimented structures (highly institutionalized), while others involve habitualized or objectified structures that are still in the process of evolving {30]. Conceptualizing levels of structuration as degrees of institutionalization thus allows for exploring the emergence of a sedimented structure supportive of NRBIs in a university, which I will do in the following sections.

3. Materials and Methods

This paper seeks to identify the factors that contribute to the institutionalization of NRBIs in universities and to explore the challenges individual actors who engage in such activities face. The purpose and exploratory nature of this research required a deep approach and the selection of a university where such innovations have achieved a high degree of institutionalization over time. Therefore, it was decided to proceed with a single case study, as this enabled me to unearth the effect of a wide range of external and internal dynamics on an organization [33]. The university selected was the University of Aveiro (UA), a young university located in Portugal and characterized as entrepreneurial and innovative, which is reflected in its membership to meta-organizations such as the European Consortium of Innovative Universities (ECIU).

UA was established in 1973 with the mission of reviving regional socioeconomic prospects. As such, the university has extensively engaged with the surrounding region in many areas. The university

does not have faculties, but rather 16 departments. Some of these departments are affiliated with commonly shared (by these departments) research centers, where most of the NRBIs seem to take place. The university is located in the Aveiro Region, in the center of the country (Centro Region, a statistical NUTSII subdivision). The region is abundant in natural resources because of the forests and coast (the Atlantic Ocean) where it is situated. This abundance is also reflected in its industrial structure: the fishing, cork, and pulp and paper industries are strong within the region. The location of the Aveiro Region can be seen in the Figure 1 below.

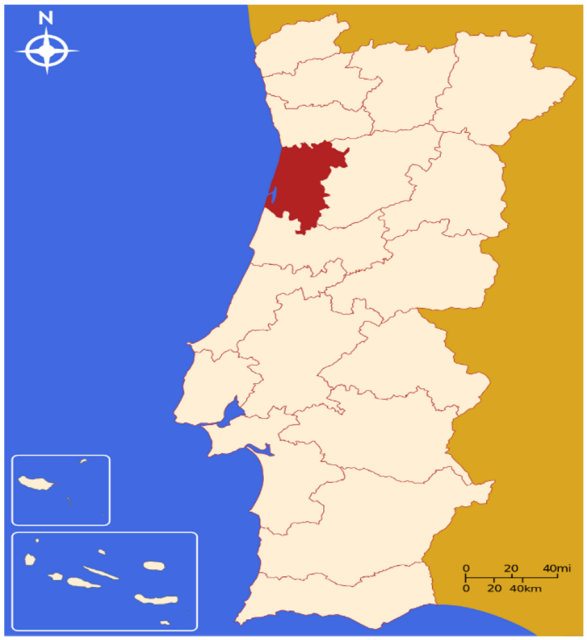

Figure 1. Geographical location of Aveiro in relation to Portugal. Source: Wikimedia Commons.

In order to access information on NRBI-related activities in UA, the projects listed on the website of each department and research center were mapped out. To acquire information on different aspects of NRBIs, such as the institutionalization process, historical continuity, and challenges, semi-structured interviewing was employed as a research method. Since the main goal in accessing information on NRBIs within UA was to find informants that had either academic and/or administrative experience in bioeconomy projects, criterion sampling was administered. Following that, a total of 33 individual academics involved in NRBI-related projects were identified. All 33 academics, as well as a member of the rectory team, an expert in a technology transfer office, and a manager of a company collaborating with UA intensively, were contacted to acquire an enlarged institutional perspective. Overall, 24 semi-structured interviews (21 with academics) ranging from 37 min to 85 min were conducted. A secondary source of information came through analyzing relevant reports, such as UA strategic plans and action plans, national/regional innovation and development strategy documents (namely Portugal 2020 and Centro 2020), as well as smart specialization strategies at both the national and regional levels. The choice of methods had a limitation though: the websites of the departments and research centers were mapped out to locate the NRBI-related projects in the university, but there might have been some projects that were not listed on these websites. Nonetheless, conducting interviews with 21 out of the 33 available academic staff and 3 members from the rectory team, technology transfer office, and a company enabled me to acquire sufficient data, with which the institutionalization process was analyzed. The distribution of interviewees across units is provided in the Table 1 below.

Table 1. Number of interviewees for each unit.

Department of Chemistry: 5	Department of Biology: 4
Department of Geosciences: 2	Department of Environment and Planning: 2
Department of Economics, Management, Industrial Engineering, and Tourism (DEGEIT): 2	Department of Material and Ceramic Engineering: 2
Department of Social, Political, and Territorial Sciences: 1	Department of Mechanical Engineering: 1
Department of Electronics, Telecommunication, and Informatics: 1	Department of Physics: 1
Rectory Team (also academic staff): 1	UATEC (Technology Transfer Office): 1
Manager of a Company: 1	TOTAL: 24

Each interview focused on a set of questions and discussions on the following topics: (a) the time (exact or approximate) academics began engaging with such activities; (b) the kind of products that are generated through such innovations; (c) the challenges interviewees have faced so far; (d) the impact of the external environment and dynamics on these activities; (e) collaboration partners and networks (within UA and across organizations); (f) the factors that facilitate these activities; and (g) the personal and institutional gains from engaging in such activities. The answers were transcribed and inductively coded later [34], and the content was thematically analyzed [35]. The analysis indicated that external factors considerably legitimize these activities and provide significant financial resources, while internal organizational-level efforts facilitate them through newly created organizations, thereby reinforcing the institutionalization process. However, there are significant dynamics in both dimensions (internal and external) that, at the same time, impact these innovations negatively, some of which pose a further threat to this highly institutionalized structure. A representative sample of such innovations and their specificities is now provided, and then the emergence of a sedimented structure supportive of NRBIs and signs of a high degree of institutionalization are addressed.

Academics in UA have engaged in a variety of innovations based on natural resources, ranging from eucalyptus bark and apple peels to microalgae and seaweed. A detailed description of some of the innovation activities and their outcomes is provided in the Table 2 below.

Table 2. Specificities of natural resource-based innovations in the University of Aveiro (UA).

Natural Resource	**Innovation Activity and/or New Product**
Eucalyptus bark	Extracting a set of compounds that have anti-inflammatory properties to be used in the pharmaceutical industry. Extracting cellulose composites and fibers to be used for a variety of car components and sold to major automobile companies, such as Mercedes.
Fruit residue and wine leaves	Extracting bioactive compounds to develop antioxidant supplements that can be added to jam, yogurt, etc.
Side streams of pulp and the paper industry	Producing ethanol through cellulose to be used as biodiesel and feedstock for the chemical industry.
Apple and pear peels	Extracting vitamins, minerals, and flavors to be used as food supplements for humans (in chocolate bars, cookies, etc.) and animal feed (for cattle and fish farming).
Microalgae	Extracting Omega 3 and bioactive compounds and developing biopolymers to be used in the pharmaceutical industry and medical applications.
Aquaculture waste	Extracting polysaccharides and protein to be used in biomedical applications, such as tissue engineering and regenerative medicine.

Table 2. *Cont.*

Natural Resource	Innovation Activity and/or New Product
Crustacean shells	Developing tissues to be transplanted into patients
Arthropods	Extracting chitin and polysaccharides to be used in a dental application (i.e., the layer-by-layer technique) and to produce microscopic films.
Apple and orange juice waste	Extracting vitamins and minerals to develop an animal feed formulation for racehorses and pigeons.
Cephalopods (squid, octopus, cuttlefish, and underexploited species such as flying squid)	Increasing their position in the value chain by developing new products, such as smoked octopus and octopus carpaccio, and developing products for the canning industry.
Seaweed	Developing seaweed extracts for the cosmetic industry and producing seaweed in different forms, such as dried seaweed, seaweed powder, and canned seaweed.

Some of the products emerging through these innovations, such as food supplements, seaweed powder, and feedstock, are already on the market, thanks to collaboration with some local and international firms, while others, such as microscopic films and biopolymers for the pharmaceutical industry, are either in the process of finalization or in beta tests.

4. Results and Discussion

4.1. The Path to a Sedimented Structure and Signs of a High Degree of Institutionalization

While it is rather difficult to pinpoint the exact time period when an NRBI-based structure have passed through the habitualization, objectification, and sedimentation phases, it was still possible to identify approximate timelines, based on the documentary data and interviews. The history of NRBIs was traced back to as early as 1991, thereby indicating that the institutionalization process has at least 29 years of history. As such, my attempts to identify these three phases began with this particular year.

The first phase, habitualization, took place between 1991 and 2001. During these years, engaging with NRBIs was an activity of some academic staff, who were mostly from the chemistry, biology, and environment and planning departments and the research center QOPNA (Organic Chemistry, Natural Products, and Food Stuffs, established in 1994). The involvement of other disciplines was visible, yet rather limited. Research and innovation based on natural resources was economically and technically a costly endeavor. In addition, support from the external environment in providing legitimacy and resource mobilization was minimal to none.

The second phase, objectification, occurred in the years between 2002 and 2011. During this phase, the structure became more permanent and widespread in the sense that two more research centers, CICECO (the Aveiro Institute of Materials) and CESAM (the Center for Environmental and Marine Studies), were established in 2002 and 2005, respectively, and the departments involved in such activities (i.e., the Department of Economics, Management, Industrial Engineering, and Tourism (DEGEIT), the Department of Geosciences, and the Department of Materials and Ceramic Engineering) became more heterogeneous. In 2006, UATEC (the Technology Transfer Office) was established, which provided needed support for biobased start-ups and spin-offs. The first signs of external legitimacy also appeared, with the publication of the National Ocean Strategy in 2006 and an emphasis on the blue economy [36]. In addition, the Chair of the Economy of the Sea was founded in 2011, together with the state bank Caixa Geral de Depositos. Innovation and research based on natural resources was still a costly enterprise, yet economically and technologically, it had become more viable, compared to the previous phase.

The last phase, during which the structure became sedimented, reaching a high degree of institutionalization, took place from 2012 onwards: UA has thus sustained historical continuity of the structure for 29 years. New units have been established in the university to support these activities,

and external legitimacy and resource mobilization have been further strengthened at the regional, national, and European level (see Section 4.2). The number of bioeconomy projects has multiplied. These activities have started to produce outcomes that are in line with institutional goals, such as attracting external funding and increasing scientific publications, thereby helping UA's position in the rankings. Opposition to such innovations seems to be little to none.

Further signs of a high degree of institutionalization include research and innovation based on natural resources being taken for granted. This was articulated by a member of the academic staff: "Our students have already started to suggest this (research on the valorization of natural resources) as their thesis topic. We do not push them towards this specifically." (Chemistry, 5). Another member of the academic staff reflected on the extent of research and innovation based on natural resources within the university:

> "I am not even from these disciplines (chemistry and biology), and whenever I go to a conference or a meeting, especially in Europe—when I tell them I work in the University of Aveiro—they know it because of two things: entrepreneurship and bioeconomy. Even the people in my own discipline. I mean I understand entrepreneurship, but I was really surprised that many people know bioeconomy." (DEGEIT, 2)

Faculty members, particularly those in chemistry and biology departments, quite often receive requests from foreign PhDs and postdocs, who would like to make either short- or long-term research visits to work on their research projects relating to NRBIs. Additionally, the departments that are involved in these projects have become even more heterogeneous, with atypical collaborators, such as the Department of Biology and the Department of Electronics, Telecommunication, and Informatics.

4.2. Factors Contributing to the Institutionalization Process

There are several factors that have legitimized and facilitated NRBIs in UA, thereby substantially contributing to the institutionalization process. In this section, these factors are divided into two groups, external and internal, and then their characteristics are elaborated on.

4.2.1. External Factors

The external environment of UA is composed of three main layers: a regional (Centro Region), national (Portuguese government), and supranational (European Commission/European Union) layer. In the outer circle lies supranational entities, and the analysis here starts with this particular layer. There has been a heightened emphasis on bioeconomy and innovation at the European level, particularly since 2010. The European Commission published a bioeconomy strategy entitled "Innovating for Sustainable Growth: A Bioeconomy for Europe" in 2012 [37], and it has established a bioeconomy subdivision under the Directorate-General for Research and Innovation. The strategy was later substantially updated, calling for greater contributions from universities [2]. Both the Commission and the European Union have also supported bioeconomy-related initiatives, such as the EU Bioeconomy Network (https://eubionet.eu) and the European Bioeconomy Alliance (https://bioeconomyalliance.eu/). The discourse around bioeconomy has been strong and visible, with many talks and interviews from European Commission-level individuals, such as the Commissioner (2014–2019) for Research, Science, and Innovation, Carlos Moedas (https://www.youtube.com/watch?v=GqV_3kvo-Rc), and the Director for Bioeconomy (DG RTD), John Bell (https://www.youtube.com/watch?v=sASZyaEOnHk). Furthermore, the European Commission published a guide in 2012 on how to develop, implement, and monitor smart specialization strategies (RIS3), a policy concept that embodies a place-based approach to innovation and places great emphasis on the local strengths and assets of a given region, including its natural resources. The Commission decided to make it an ex ante condition for regions that aim to benefit from European Structural and Investments Funds. That is, these regions now need to develop their own smart specialization strategies based on their regional strengths to be able to utilize structural funds for research and innovation projects within their geographical vicinities.

The second layer is composed of the national environment. The Portuguese government prepared its national smart specialization strategy (Estrategia de Investigaçao e Inovaçao para Uma Especializaçao Inteligente) in 2014. The strategy has four pillars, one of which is "To Valorize Endogenous Resources" (translated) [38] (p. 6), an area that serves bioeconomy endeavors well. The priorities section of the strategy document entails the fourth thematic axis of "Natural Resources and Environment" (translated), with clearly emphasized subthemes: agri-food, forests, the sea economy, and water and the environment [38] (p. 6). A related budgetary program document, Portugal 2020, further reinforces the areas to which € 25 billion (up to 2020) is allocated. One of the specified areas is the "Sustainable and Efficient Use of Resources" (translated), for which a quarter of the available funding is allocated [39]. These documents set out very clearly that innovation in bioeconomy activities is a national priority, and it is highly encouraged. Regions are expected to develop their own smart specialization strategies that are in line with the national one, which puts the focus on the closest circle of UA, the regional layer.

The Centro Region (the third layer) also developed its smart specialization strategy in 2014. One of the four domains specifically addresses the "valorization and efficient use of endogenous natural resources" (translated) [40] (p. 9). Under this domain, there are action points targeting specific innovation areas, such as the sea, forests, materials, agriculture, biotechnology, and rural innovation [40] (p.10), which are supportive of NRBIs. The strategy is significant and binding in the sense that research and innovation projects proposed by universities, firms, or other entities are required to link to these regional domains in order to be able to benefit from the allocated funding. At the regional level, it is not only the Centro Region's smart specialization strategy that has provided fertile ground for bioeconomy activities. The region also possesses a considerable knowledge base and a variety of firms that are interested in innovation within the bioeconomy sector. In addition to UA, there are also two other universities in the region, the University of Coimbra and the University of Beira Interior, with which collaboration on NRBIs takes place. Furthermore, there are several companies (such as Sonae, a multinational company that possesses one of the two biggest retail firms in Portugal (Continente), and Algaplus, which is a small firm specializing in seaweed and microalgae production) that are interested in NRBIs and collaborate with UA extensively.

4.2.2. Internal Factors

A similar regulatory mobilization can be found within UA as well. To illustrate this, sustainability is one of the 10 values and principles in the strategic plan, and there are two dimensions, namely "actively contribute to regional development" (translated) and "link research and teaching to sustainable development goals (SDGs)" (translated), both of which emphasize "multistakeholder partnerships to foster the generation of new products and accord research activities, with a view toward contributing to the sustainable development of the region" (translated) [41] (pp. 44–45). The action plan further reinforces the generation of new products, including those generated through NRBIs, as the following statement indicates:

> "To achieve this goal (working toward sustainable development goals), it is necessary to support entrepreneurial initiatives within the circular economy with the potential to generate new products, new processes, and new forms of organizations. This should also strengthen links with the social fabric of the region, multiple institutions, and the third sector". (translated) [42] (p. 28)

There have also been other strong efforts to structure these activities across the organizational field. In 2013 and 2014, UA established eight technological platforms, of which three specifically were intended to spur innovation in the bioeconomy sector: the Agri-Food Technological Platform, the Technological Platform of the Sea, and the Technological Platform of the Woodlands. Both academic and administrative personnel work on these platforms, and they provide support in many areas, including bureaucratic challenges when applying to national and international funding agencies for

bioeconomy-related projects and channeling external entities (with the aim of getting them to cooperate with UA in the bioeconomy sector) toward the right people with specific expertise on the subject matter:

> "In the technological platforms, there are many postdocs from several areas that support us in all administrative and bureaucratic aspects that are needed for these types of projects (bioeconomy). They are very, very important for us. I would always keep the platforms." (Chemistry, 1)

> "Our main aim there (in the technology platform of the sea) is to be the first port of entry when someone comes to the university and says 'I have a problem with this. Can you help me?' Because what we have realized in the past is that you come to the university, knock on my door, and say 'Hey, I have a problem with cows' and I say 'Look, I work with fish, sorry'. End of interaction. Now, we overcome this through technological platforms." (Biology, 2)

At the time of this paper being written, UA was undergoing a change in its organizational structure related to its links with the region. A new organization, UACOOPERA (Unidade Transversal Para a Cooperaçao com a Sociedade), was created to support several university units in their cooperation with external partners and minimize fragmentation. There seems to be a serious intention to ensure that UA continues to emphasize the role of technological platforms in supporting NRBIs within the new restructuring: the university has organized its technical competencies regarding regional engagement into nine areas, three of which are highly relevant for bioeconomy activities (namely Food and Agriculture, Forestry, and Marine), while two others (Industrial Products and Processes and Territories, Development, and Habitat) can provide partial support.

The technology transfer office (UATEC) has also stepped in to assist on several aspects of innovations within the bioeconomy sector: patenting, licensing, financial advice, encouraging the establishment of start-ups, and mediation between academic staff and companies. Moreover, UA has established two related guest chairs in partnership with well-known entities, the Economy of the Sea–Caixa Geral de Depositos (a state bank) and Biorefinery/Bioeconomy–the Navigator (a pulp and paper company).

Multidisciplinary research centers have been at the heart of NRBIs. In particular, CICECO, CESAM, and QOPNA are the three biggest centers in which research and innovation activities associated with natural resources are concentrated. They are supported by GOVCOPP (Governance, Competitiveness, and Public Policies), a research center that incorporates perspectives from different disciplines, ranging from economics and management to urban planning and public policy. The multidisciplinary aspect of these research centers has facilitated the scaling up of natural resource-based research and innovations by providing an organizational platform in which cross-fertilization between different disciplines can increasingly be achieved. A summary of all the external and internal factors contributing to the institutionalization process and their chronological reflection can be found in the Table 3 and Figure 2 below, respectively.

Many of these innovations have so far yielded quite novel findings, as well as new products, which ideally serves the second mission of the university—research—well. More specifically, the novelty of the findings emerging from the projects provides researchers with the opportunity to disseminate them through scientific publications. This benefits researchers in terms of their career progression, since high-quality publications still remain one of the most important requirements for academic promotion, if not the most important. These projects have also attracted a significant level of funding from a variety of external sources. Overall, publications and the level of funding attracted then contribute to achieving an institutional goal that has experienced a heightened emphasis, particularly in the last two decades, i.e., a better performance in global university rankings.

Table 3. Factors contributing to the institutionalization process. NRBI: natural resource-based innovation.

External Factors	**Contribution to Institutionalization**
European Level	*Specific Ways*
• Publication of bioeconomy strategy documents in 2012 and 2018 • Bioeconomy subdivision under the Directorate-General for Research and Innovation • Strong discourse around bioeconomy and its spread and diffusion through media • Support for bioeconomy-related associations (the EU Bioeconomy Network, the EU Bioeconomy Alliance) • Smart specialization and emphasis on local assets	• Providing external legitimacy for bioeconomy activities by placing them closer to the center of the innovation agenda at the continental level and creating new organizations at the Commission level • Facilitating the adoption of bioeconomy by new actors by keeping the discourse level high (e.g., in media), mobilizing resources (e.g., financial), and supporting those who already adopt it (e.g., the EU Bioeconomy Alliance)
National Level	*Specific Ways*
• National smart specialization strategy • Budgeting program of Portugal 2020 • National Ocean Strategy	• Reinforcing external legitimacy (triggered by the EC) and turning bioeconomy into a top national priority by creating a pillar (valorizing endogenous resources) and one thematic axis (natural resources and the environment) • Encouraging potential adaptors by mobilizing a significant amount of financial resources (6.25 billion Euros) for the dimension of the sustainable and efficient use of resources
Regional Level	*Specific Ways*
• Smart specialization strategy of the Centro Region • Availability of two more universities and a variety of firms, as well as an abundance of natural resources	• Encouraging academics to link their research to certain domains, one of which is the "valorization and efficient use of endogenous resources", by granting a significant amount of funding for related projects • A conducive environment, both physically and socially, to the cultivation of intergroup alliances related to NRBIs both within UA and between institutions across the region
Internal Factors	**Contribution to Institutionalization**
• Sustainability, as one of the 10 values, and "link research and teaching to sustainable development goals", as an important goal, with a clear emphasis on the generation of new products through a circular economy • Technological platforms • UACOOPERA • Food and Agriculture, Forestry, and Marine as three important areas of cooperation, with external partners in the restructuring phase • Multidisciplinary research centers, such as CICECO, CESAM, QOPNA, and GOVCOPP • UATEC • Two guest chairs: the Economy of the Sea–Caixa Geral de Depositos and Bioeconomy–the Navigator	• Sealing the legitimacy triggered by external stakeholders and turning NRBIs into fully legitimate university activities • Structuration of NRBIs through newly created organizations, units, and external partnerships • Facilitating and encouraging the potential adaptors to be heterogeneous through bureaucratic and academic support

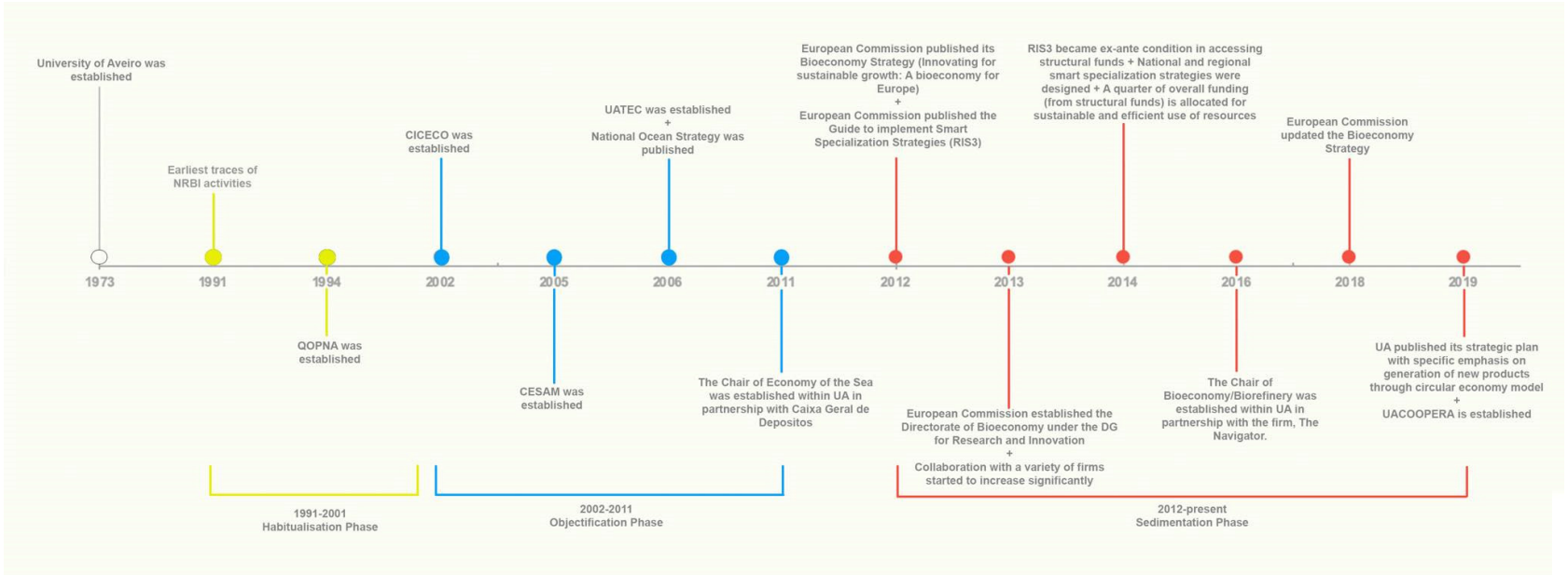

Figure 2. A timeline of external and internal factors supporting NRBIs in UA and the degree of institutionalization within the three phases.

4.3. Challenges and Risks to the Institutionalized Structure

So far in this paper, the determinants of the institutionalization of NRBIs in UA have been covered. Despite the emergence of a sedimented structure supportive of NRBIs, there have also been challenges, some of which seem to be putting the institutionalized structure at risk. In this section, the regulatory and practice-level challenges that make harnessing the full potential of such activities within UA difficult are addressed first. Following this, systemic challenges that go beyond impeding these activities and pose a risk to the institutionalized structure in the long term are then elaborated on.

The mobilization of financial resources has, so far, significantly contributed to the institutionalization of NRBIs. Nevertheless, instability regarding the level of funding and success rate of the funding granted by external organizations, such as the Foundation for Science and Technology in Portugal (FCT), as well as continuous changes in the rules and regulations regarding project applications, challenge these activities, as was expressed by two academic staff members:

> "Instability is the problem: instability in the sense that the level of funding, the mechanisms for funding, the platforms on which we submit the projects, the reporting rules, etc., are changing quite often. The amount of funding available either for projects or directly applied to human resources, etc., is changing in a dramatic and somewhat unexpected way." (Geosciences, 1)

> "Typically, the level of funding [success rate] when you submit a project is in the range of 10% or 13%, like in most of Europe. This is absolutely frustrating, because you spend a lot of time preparing the project, and as a consequence, there were many people who said, 'I will not even apply. It is a waste of time.' In that year, FCT funded around 60% of the projects. It is good in the sense that the system needs a lot of funding, because we have gone through this crisis. However, then, many people got frustrated again about this. In this sense, the system needs to be more predictable." (Material and Ceramic Engineering, 1)

The instability in the success rate seems to impact NRBIs negatively in the sense that faculty members have difficulty predicting which year will be the best to apply for funding, thereby limiting the number of bioeconomy projects that could find a home in the list of approved projects all over Portugal. However, it is not only the level of instability and continuous changes in rules that create funding-related challenges: regulations on how to spend externally acquired funding also create hindrances, as one academic staff member articulated:

> "We have a large amount of rules that cannot be directly applied to managing these [bioeconomy] projects. That is a very big constraint. For instance, when you have a contract with the industry and you are receiving the money, for example, in October, you have to spend the money in the same civil year. So, you receive the money in October and cannot spend it all until the end of December. You are losing all the money. I lost lots of money, and I was not able to complete projects because of that." (Chemistry, 4)

The regulations related to financial spending stem from the austerity period, during which the Portuguese government decided to increase its control over organizational spending and money inflow/outflow across the institutions of the country.

Most NRBIs also require cooperation with external stakeholders, such as firms and other public/private organizations. However, the expectations of universities and firms in terms of these innovations can change considerably, which can pose a challenge to intensive cooperation, which is needed for such innovations. An academic staff member that extensively collaborates with firms on such innovations noted the following:

> "We need to understand that with the outcomes of applied research like this [bioeconomy], we need to be aware of the needs of firms. That is completely different when we do fundamental research. We are very lucky in this case [referring to collaboration with a specific company], because X [the manager of the company] has a PhD degree and even a postdoc. It helps a lot

> that X understands us, but unfortunately, this has not been the case in collaboration with other firms." (Biology, 3)

> "I always tell them (academic staff at UA) that sometimes I wish there were ideas more focused on the commercial side of the product (rather than publications) coming from the university. I wish someone came and told me 'Why don't you use this product?' For that, they are always waiting for the company to provide all of the information." (Manager of a company)

While university–firm interactions pose challenges that have not yet been overcome, a new challenge has appeared on the horizon because of new external partners, namely public and private organizations such as cooperatives, associations, and municipalities. Many academic staff members noted the difficulty of having these partners on board with respect to working toward NRBIs. Some of them discussed the financial capacity of these organizations: "Sometimes you (as an institution) need to spend money before you receive money from the EU (Interreg Projects), which is fine for the university. They put the money forward, because they know in 6 months' time, they will get the money, but for small businesses and these kinds of organizations (fishing-related associations), this is not easy." (Environment and Planning, 2). The others addressed the novelty of these collaborations for both partners:

> "I think the biggest difficulty is not even not knowing people from academia. I think academics kind of speak the same language and understand each other, even if they do not know each other. But this bridging with people in these organizations [the fishing industry and fishing-related associations and municipalities] is so, so difficult. Explaining to them what the project is about, getting their interest, convincing them that the project is viable and explaining the rules and procedures (of EU-funded projects) is very challenging." (Environment and Planning, 1)

However, not all of the challenges stem from the external environment in which UA operates or external stakeholders with which UA collaborates. Some of them arise due to the internal organizational environment, as articulated by an academic staff member:

> "What we need to understand is that when an enterprise decides to go to a university to say 'we need you to develop this project with us', they have thought about it many, many times already, and they have made all the calculations. So, when they do this, for them it is completely unacceptable that you take one month to decide whether you are in or out." (Biology, 4)

In addition, academic promotions are still heavily dependent on publication outcomes, which can be observed as another challenge in engaging with NRBIs. Some of these activities lead to publications, which are still highly influential in academic promotion and generate external funding for the university, while some others do not. When they do not, the question emerges as to what the professional benefits are of engaging with such activities for individual academics. The only source of motivation is then purely altruistic, which may not be enough to structure these innovations across the field and cannot be taken for granted: "I have pleasure doing them [NRBIs]. I do not get anything from doing them. This is a very unfair thing, but that is the way. Our system unfortunately does not encourage them or recognize their value." (Chemistry, 4). Moreover, "I am sad for my postdocs or assistant professors here, who will not be able to progress in their career while doing them and will likely give up or significantly decrease the number of projects." (DEGEIT, 1). This seems to have an impact mostly on assistant professors that are on a probation period, during which scientific publications have a significant determining power on promotion, as well as postdocs.

All these external and internal challenges make harnessing the full potential of NRBIs in UA considerably difficult, yet they do not shake the institutionalized structure dramatically. Nonetheless,

three systemic factors that pose a serious threat to this institutionalized structure and possess the potential to trigger a deinstitutionalization (in the long term) were identified. The first of these concerns external shocks, e.g., financial crises and subsequent austerity periods. The impact of the 2008 financial crisis started to be more visible in 2011 (and after). The outcome was an austerity policy, which had a severe impact on universities across the country. Higher education institutions experienced substantial budget cuts, particularly in 2012 and 2013, which had a detrimental impact on NRBIs in UA. When asked about continuity in such innovations, all participants referred to the period of 2012–2013, stating that the number of such projects was either zero or diminished by at least half, except for one academic staff member, who was able to sustain a number of projects because of intensive collaboration with European partners and by securing prestigious European-wide research grants. Even so, the academic stated that such an achievement was extraordinary, unexpected, and almost impossible to replicate. Budget cuts impacted bioeconomy activities negatively, such that there was significantly less funding available for such projects (particularly from the FCT) and significantly fewer PhD scholarships and postdoctoral fellowships (groups of qualified researchers that have played a key role in NRBIs). With such austerity and economic uncertainty still looming, worries as to what the next external shock(s) might take from such innovations remain.

The second factor that poses a threat to the institutionalized structure is the rise of rankings in the higher education sector and its rapid permeation of organizational fields in universities. In a relatively short period of time, rankings have gone from being a set of indicators for universities to a mechanism through which universities try to build a competitive advantage, status, and prestige. UA has not been exempt from this, and the importance of rankings has increased. To illustrate this, a recent document that provides information about the university (e.g., facilities, research capacity), which was published in 2018, starts with the position of UA in the global rankings on the first page [43]. Moving up in the rankings requires increases in the number of publications and citations and in the amount of research funding (and, to a small extent, industry income, e.g., see the Times Higher Education Rankings). Rankings have, until recently, contributed to the institutionalization of NRBIs in UA, as some of the projects have resulted in impactful publications and industry income. However, many of these projects have not led to publications or have not attracted a significant amount of external funding, thereby, ironically, turning rankings into one of the biggest threats to the institutionalized structure. In recently released rankings, UA was 4th (sharing the position with five other universities) nationally out of 13 universities in one ranking [44], and it was positioned in 5th place nationally out of 7 universities in another [45].With increasing discourse on rankings across the organizational field in the university, the possibility has emerged of UA aiming to better its position nationally and globally in the coming years by placing more emphasis on fundamental research and securing prestigious grants, for instance, from the European Research Council. This might result in taking attention away from bioeconomy projects, which usually entail applied research and do not necessarily lead to publications, risking the continuity of NRBIs (as articulated by many academics).

One last factor threatening the continuation of the sedimented structure supportive of NRBIs relates to the demographic characteristics of the individual academics that lead these innovations. There are many senior academics (including those who were identified as significantly contributing to these innovations but with whom securing an interview was not possible) that are in their mid- or late-60s. Those who were interviewed expressed their intention to reduce their engagement with NRBIs and/or retire soon or within the next decade. In the meantime, there are not enough positions advertised for newly graduated PhD students and postdoctoral fellows who have been supervised by these senior academic staff and who have developed research and professional expertise on NRBIs. The problem is exacerbated when these new PhD graduates or postdocs are not able to stay in Portugal, but rather have to look for academic jobs abroad, which makes collaboration on these projects more difficult, as many of them require close interaction with nonacademic partners. Furthermore, there is also no guarantee that newly hired assistant professors will engage in such activities for a long time, especially if they are on a probation period, during which time publications are a significant

benchmark for promotion. While all of these dynamics already produce some hindrances to the continuity of NRBIs, it can be inferred from the findings that the intensity of these three challenges (austerity and economic uncertainty, rankings, and demographic characteristics) might further increase and pose serious risks to the sedimented structure within the next 10–15 years, unless the specificities of these dynamics change substantially. A summary of these types of challenges is provided in the Table 4 below.

Table 4. Challenges to the institutionalization process.

Regulatory and Practice-Level Challenges Making Harnessing the Full Potential of NRBIs Difficult
• Instability in the level of funding (success rate) in grants provided by external organizations; • Financial regulations relating to organizational spending; • Different expectations for university–firm collaborations; • Difficulty in cooperation with atypical external partners, such as associations, municipalities, and nongovernmental organizations; • Slow internal decision-making processes; and • Publications remaining the major benchmark for promotion.
Systemic Challenges Posing Risks to the Institutionalized Structure Supportive of NRBIs
• Financial crises, economic uncertainty, and ongoing austerity; • University rankings; and • Demographic characteristics of academics who engage with NRBIs.

5. Conclusions

This paper sought to explore how NRBIs become institutionalized in universities and the factors that contribute to and challenge the institutionalized structure. In the theoretical framework, the level of structuration was conceptualized the degree of institutionalization in order to be able to account for how a structure supportive of NRBIs (that is, reaching a high degree of institutionalization) becomes sedimented. This was conducted empirically in a public university that has a relatively long history of and active engagement with NRBIs.

Within this framework, the institutionalization process requires legitimacy, appropriate values, resource mobilization, and cultural–cognitive belief systems. Assumptions that are taken for granted and an increasing heterogeneity of adaptors of the new practices strengthen the institutionalization process to such a degree that it becomes sufficiently sedimented and can exert power over both existing and newly arrived actors in the field. The case of UA demonstrates that the characteristics of these organizational aspects play a key role in what kind of university activities become institutionalized, as well as how and when they achieve a high degree of institutionalization. Therefore, this study contends that this perspective (conceptualizing the level of structuration as the degree of institutionalization) might be generally helpful in analyzing how other university activities achieve a high level of structuration and how other organizations can institutionalize contributions to NRBIs, particularly at a time when public entities, such as municipalities, are also increasingly expected to play an important role in NRBIs within their localities [46].

Legitimacy and resource mobilization are manifested through multiple layers (European, national, and regional levels) and sources. Clarity in the discourse on bioeconomy and emphasis on the sustainable use of endogenous natural resources (which were found throughout various documents, such as the strategic plan of the university and national/regional smart specialization strategies) have significantly facilitated the establishment of the legitimacy process of NRBIs as a university activity. A similar explicit message was observed in resource mobilization, with almost a quarter of structural funds being allocated for these activities nationally, which has further been enriched by willing firms who can also deploy significant financial resources to NRBIs. These externally triggered dynamics have found institutional resonance within the university, and UA has responded by creating new units,

structures, and organizations and by mobilizing human resources. These new units, structures, and organizations have considerably facilitated NRBIs, which, in turn, have aided in the emergence of a cultural–cognitive belief system and taken-for-granted assumptions. More specifically, an externally triggered and internally complemented legitimacy process and such a significant level of resource mobilization have resulted in the perception of actors that NRBIs are at the core of the organizational agenda. Newly arrived members in the field now take this assumption for granted, although there have been cases in which they either give up or reduce their level of engagement with NRBIs after a couple of years due to the strong emphasis on publications in academic promotions.

As the case study demonstrated, sedimented structures are not exempt from challenges. Some regulatory and practice-level challenges found here, such as different expectations from university–firm collaborations, a strong emphasis on publications in academic promotions, and negative impacts on various third-mission activities, concurs with the findings within the recent literature [18,47], thereby facilitating an extrapolation that they will likely continue to be seen in universities' regional contributions and in industry collaborations, unless there is a substantial change in academic promotion. A slow internal decision-making process can be explained by the characterization of universities as loosely coupled organizations composed of different academic units and hierarchies [16], which needs more consideration and should be taken into account by organizations willing to collaborate with universities. Instability in the level of funding and financial regulations related to institutional spending are ramifications of the austerity measures that have surrounded Portuguese universities. Difficulty in cooperating with newly emerged partners, such as associations, nongovernmental organizations, and municipalities, highlights the increasing role of civil society in the innovation process in the form of a quadruple helix. This necessitates a more nuanced understanding of the organizational structure of these new innovation partners in order to overcome challenges in their collaboration with universities, including those focused on NRBIs.

Three dynamics that stem from external and internal forces that pose risks to the sedimented structure were also observed: financial crises, ongoing austerity, and economic uncertainty; university rankings; and the demographic characteristics of academics. The 2008 financial crisis and the following austerity measures definitely left a negative legacy on universities, impacting NRBI activities. While Portugal is recovering from the recession slowly, the austerity measures are still not over, and economic uncertainty has not yet disappeared. To illustrate this, the public debt looms at around approximately 120% of the GDP, making it the third highest in the Eurozone [48]. This limits the amount of foreseeable investment in universities and bioeconomy projects. The result of this is significantly fewer assistant professor positions, doctoral scholarships, and postdoctoral fellowships. In this sense, it seems paradoxical that, since the financial crisis, university resources have been significantly slashed as part of the austerity measures, while at the same time, expectations from universities to further mobilize their resources to contribute to the development of their regions and society have considerably grown in the national context. The seniority of academics that engage in such innovations further risks the institutional continuity of NRBIs. This risk might be exacerbated with the removal of smart specialization, a policy tool that has so far provided a fertile ground for NRBIs, as an ex ante condition for accessing structural funds from the European Commission's next budgetary program in 2021–2027 [49], making the structure more susceptible to external shocks in the future.

One striking finding of the paper is how rankings have been transformed from a catalyst for NRBIs, considerably contributing to the institutionalization process through publications, into one of the biggest external forces threatening the sedimented structure. One possible reading might be that the importance of rankings has steadily grown since the early 2000s, and they have recently become more utilitarian than ever, as authorities, governments, and students base their decisions and investments on them [50]. In light of institutional theory, this suggests that the degree of intensity of an external factor seems to determine whether it contributes to the institutionalization of a structure or poses risks to it (or both) in different phases. Future research can further elaborate on when and how an external factor ceases to support a highly institutionalized structure and instead becomes a

threat to its long-term existence, with the potential to trigger deinstitutionalization. Future research can also focus on the institutionalization (or the lack thereof) process of NRBIs in other organizations, such as local governments, municipalities, firms, and associations, delving deep into the similarities and differences between these organizations, including universities, to formulate tailored institutional strategies fostering NRBIs.

This research is an intensive single case study of a young and entrepreneurial university, for which regional engagement has been a very important mission since its establishment and which has a relatively long history in engaging with NRBIs. It has been operating in an environment in which bioeconomy has become a priority at multiple levels, thereby providing a conducive environment for NRBIs. This suggests a potential implication for applying these findings to other higher education institutions. Universities that position themselves globally (striving for excellence) rather than intensively engaging with their own region (although this is not necessarily a binary system) and/or universities that are located in environments in which resource mobilization for bioeconomy and the discourse on it is limited might find it quite challenging to institutionalize NRBIs.

This study clearly suggests a number of policy implications. Firstly, it is time for policymakers, authorities, and governments to reconsider their treatment of rankings as a benchmark for university quality and as a criterion according to which significant resources are distributed across higher education institutions. Under the current circumstances, universities are compelled to compete with each other, which has a negative impact on individual academics, as they start to focus on publications and securing external grants to contribute to moving their universities up on the ranking tables. Secondly, policymakers have an important role to play in legitimizing various university activities and rendering them valuable by constructing a discourse around them and mobilizing different kinds of resources (e.g., financial, human, and regulatory resources). As the findings demonstrate, it is recommended that the policy sphere be explicit in their expectations of universities. In this regard, while the United Nation's Sustainable Development Goals (SDGs) constitute a timely and relevant point of departure for a variety of university third-mission activities, including NRBIs, expecting universities to contribute to the SDGs (a growing anticipation increasingly articulated by policymakers in recent years) [51] remains a rather broad policy demand. There is a need to delve deeper into the specificities of SDGs and for a more nuanced articulation of expectations from universities.

In sum, this study attempted to bridge two disconnected fields of research, namely bioeconomy and higher education studies, in light of the growing expectations of universities to mobilize their knowledge capacity and resources for NRBIs. This paper maintains that the institutionalization of such innovations in universities depends on well-coordinated internal organizational efforts, a significant time span for structuration across the field, and external factors that can provide legitimacy and considerable resource mobilization, which encourages potential adopters. Nevertheless, even sedimented structures can be susceptible to external and internal shocks, especially when the sedimentation phase is rather young, and this may eventually trigger deinstitutionalization. In this sense, it is important that sedimentation not be conceptualized as an end goal, but rather as a phase during which the structure can and should still be strengthened in order to allow it to survive across generations of actors.

Funding: The author acknowledges that the paper was supported by funding from the European Commission's Horizon 2020 Research and Innovation Programme (Marie Sklodowska-Curie Actions), grant agreement no. 722295.

Conflicts of Interest: The author declares no conflicts of interest.

References

1. Bergstrom, J.C.; Randall, A. *Resource Economics: An Economic Approach to Natural Resource and Environmental Policy*; Edward Elgar Publishing: Cheltenham, UK, 2016.
2. European Commission. *A Sustainable Bioeconomy for Europe: Strengthening the Connection between Economy, Society and the Environment. Updated Bioeconomy Strategy*; European Commission: Brussels, Belgium, 2018.
3. Birch, K. Knowledge, place, and power: Geographies of value in the bioeconomy. *New Genet. Soc.* **2012**, *31*, 183–201. [CrossRef]

4. Hetemäki, L.; Hanewinkel, M.; Muys, B.; Ollikainen, M.; Palahí, M.; Trasobares, A. *Leading the Way to a European Circular Bioeconomy Strategy*; European Forest Institute: Joensuu, Finland, 2017; Volume 5.
5. Arujanan, M.; Singaram, M. The biotechnology and bioeconomy landscape in Malaysia. *New Biotechnol.* **2018**, *40*, 52–59. [CrossRef] [PubMed]
6. Zilberman, D.; Kim, E.; Kirschner, S.; Kaplan, S.; Reeves, J. Technology and the future bioeconomy. *Agric. Econ.* **2013**, *44*, 95–102. [CrossRef]
7. Lainez, M.; González, J.M.; Aguilar, A.; Vela, C. Spanish strategy on bioeconomy: Towards a knowledge based sustainable innovation. *New Biotechnol.* **2018**, *40*, 87–95. [CrossRef]
8. Van Lancker, J.; Wauters, E.; Van Huylenbroeck, G. Managing innovation in the bioeconomy: An open innovation perspective. *Biomass Bioenergy* **2016**, *90*, 60–69. [CrossRef]
9. Purkus, A.; Hagemann, N.; Bedtke, N.; Gawel, E. Towards a sustainable innovation system for the German wood-based bioeconomy: Implications for policy design. *J. Clean. Prod.* **2018**, *172*, 3955–3968. [CrossRef]
10. Lozano, R.; Merrill, M.; Sammalisto, K.; Ceulemans, K.; Lozano, F.J. Connecting Competences and Pedagogical Approaches for Sustainable Development in Higher Education: A Literature Review and Framework Proposal. *Sustainability* **2017**, *9*, 1889. [CrossRef]
11. Farinha, C.; Caeiro, S.; Azeiteiro, U.M. Sustainability Strategies in Portuguese Higher Education Institutions: Commitments and Practices from Internal Insights. *Sustainability* **2019**, *11*, 3227. [CrossRef]
12. Waas, T.; Verbruggen, A.; Wright, T.S. University research for sustainable development: Definition and characteristics explored. *J. Clean. Prod.* **2010**, *18*, 629–636. [CrossRef]
13. Filho, W.L. About the Role of Universities and Their Contribution to Sustainable Development. *High. Educ. Policy* **2011**, *24*, 427–438. [CrossRef]
14. Toakley, A.R. Globalization, Sustainable Development and Universities. *High. Educ. Policy* **2004**, *17*, 311–324. [CrossRef]
15. Fadeeva, Z.; Mochizuki, Y. Higher education for today and tomorrow: University appraisal for diversity, innovation and change towards sustainable development. *Sustain. Sci.* **2010**, *5*, 249–256. [CrossRef]
16. Weick, K.E. Educational Organizations as Loosely Coupled Systems. *Adm. Sci. Q.* **1976**, *21*, 1. [CrossRef]
17. Maassen, P.; Stensaker, B. From organized anarchy to de-coupled bureaucracy: The transformation of university organization. *High. Educ. Q.* **2019**, *73*, 456–468. [CrossRef]
18. Cinar, R. Delving into social entrepreneurship in universities: Is it legitimate yet? *Reg. Stud. Reg. Sci.* **2019**, *6*, 217–232. [CrossRef]
19. Colyvas, J.A.; Jonsson, S. Ubiquity and Legitimacy: Disentangling Diffusion and Institutionalization. *Sociol. Theory* **2011**, *29*, 27–53. [CrossRef]
20. Lozano, R. Incorporation and institutionalization of SD into universities: Breaking through the barriers to change. *J. Clean. Prod.* **2006**, *14*, 787–796. [CrossRef]
21. Scott, W.R. (Ed.) Crafting an analytical framework: Three pillars of institutions. In *Institutions and Organizations*; Sage: London, UK, 2008; pp. 55–85.
22. Zucker, L.G. The Role of Institutionalization in Cultural Persistence. *Am. Sociol. Rev.* **1977**, *42*, 726–743. [CrossRef]
23. Krucken, G.; Meier, F. Turning the university into an organizational actor. In *World Society and Organizational Change*; Drori, G., Meyer, J.W., Hwang, H., Eds.; Oxford University Press: Oxford, UK, 2006.
24. DiMaggio, P.; Powell, W.W. The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *Am. Sociol. Rev.* **1983**, *48*, 147–160. [CrossRef]
25. Tolbert, P.S.; Zucker, L.G. Institutional Sources of Change in the Formal Structure of Organizations: The Diffusion of Civil Service Reform, 1880–1935. *Adm. Sci. Q.* **1983**, *28*, 22–39. [CrossRef]
26. Barley, S.R.; Tolbert, P.S. Institutionalization and Structuration: Studying the Links between Action and Institution. *Organ. Stud.* **1997**, *18*, 93–117. [CrossRef]
27. Berger, P.L.; Luckmann, T. *The Social Construction of Reality*; Doubleday: New York, NY, USA, 1966.
28. Giddens, A.T. *The Constitution of Society. Outline of the Theory of Structuration*; Polity Press: Cambridge, MA, USA, 1984.
29. Sewell, J.W.H. A Theory of Structure: Duality, Agency, and Transformation. *Am. J. Sociol.* **1992**, *98*, 1–29. [CrossRef]
30. Fuenfschilling, L.; Truffer, B. The structuration of socio-technical regimes—Conceptual foundations from institutional theory. *Res. Policy* **2014**, *43*, 772–791. [CrossRef]

31. Tolbert, P.S.; Zucker, L.G. The institutionalization of institutional theory. In *Studying Organization. Theory and Method*; Clegg, S., Hardy, C., Eds.; Sage: London, UK, 1999; pp. 169–184.
32. Hajer, M. *The Politics of Environmental Discourse*; Oxford University Press: Oxford, UK, 1995.
33. Stake, R.E. Qualitative case studies. In *Handbook of Qualitative Research*; Denzin, N.K., Lincoln, Y.S., Eds.; Sage: Thousand Oaks, CA, USA, 2005; pp. 443–466.
34. Thomas, D.R. A General Inductive Approach for Analyzing Qualitative Evaluation Data. *Am. J. Eval.* **2006**, *27*, 237–246. [CrossRef]
35. Fereday, J.; Muir-Cochrane, E. Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. *Int. J. Qual. Methods* **2006**, *5*, 80–92. [CrossRef]
36. Diario da Republica. Resoluçao de Conselho de Ministros, No. 163/2006. *Diario da Republica* **2006**, *1*, 8316–8327.
37. European Commission. *Innovating for Sustainable Growth. A Bioeconomy for Europe*; European Commission: Brussels, Belgium, 2012.
38. Portuguese Government. Estrategia, de Investigaçao e Inovaçao para Uma Especializaçao Inteligente. 2014. Available online: https://www.portugal2020.pt/sites/default/files/enei_versao_final_0.pdf (accessed on 26 October 2019).
39. Agencia Para O Desenvolvimento E Coesao, I.P. Portugal 2020: Objetivos, Desafios e Operacionalizaçao. 2014. Available online: https://www.portugal2020.pt/sites/default/files/portugal2020objetivos_desafios_19_dez_14.pdf (accessed on 26 October 2019).
40. Comissao de Coordenaçao e Desenvolvimento Regional do Centro. RIS3 do Centro de Portugal. Estrategia, de Investigaçao e Inovaçao para Uma Especializaçao Inteligente. 2014. Available online: https://s3platform.jrc.ec.europa.eu/documents/20182/232332/PT_Centro_RIS3_201402_Final.pdf/78c792ce-e32d-4e50-986b-ec8ea8df656e (accessed on 26 October 2019).
41. University of Aveiro. Plano Estrategico Da Universidade De Aveiro Para O Quadrienio 2019–2022. Available online: https://www.ua.pt/en/about-us (accessed on 3 November 2019).
42. University of Aveiro. Plano De Atividades Da Universidade De Aveiro. Available online: https://www.ua.pt/en/about-us (accessed on 3 November 2019).
43. University of Aveiro. University of Aveiro. Available online: https://issuu.com/universidade-de-aveiro/docs/brochura_ua_ingl (accessed on 17 November 2019).
44. Times Higher Education. World University Rankings 2020. Available online: https://www.timeshighereducation.com/world-university-rankings/2020/world-ranking#!/page/0/length/25/locations/PT/sort_by/rank/sort_order/asc/cols/stats (accessed on 17 November 2019).
45. Quacquarelli Symonds. QS World University Rankings 2020. Available online: https://www.topuniversities.com/university-rankings/world-university-rankings/2020 (accessed on 17 November 2019).
46. Maina, S.; Kachrimanidou, V.; Koutinas, A. A roadmap towards a circular and sustainable bioeconomy through waste valorization. *Curr. Opin. Green Sustain. Chem.* **2017**, *8*, 18–23. [CrossRef]
47. Barnes, T.; Pashby, I.; Gibbons, A. Effective university-industry interaction: A multi-case evaluation of collaborative R&D projects. *Eur. Manag. J.* **2002**, *20*, 272–285.
48. Stratfor. Can Portugal Remain the Eurozone's Anomaly? Available online: https://worldview.stratfor.com/article/how-much-longer-will-portugal-remain-eurozones-anomaly-europe-economy-elections (accessed on 22 November 2019).
49. Foray, D. In response to 'Six critical questions about smart specialization'. *Eur. Plan. Stud.* **2019**, *27*, 2066–2078. [CrossRef]
50. Hazelkorn, E. *Rankings and the Reshaping of Higher Education: The Battle for World-Class Excellence*; Springer: Berlin/Heidelberg, Germany, 2015.
51. Zamora-Polo, F.; Sanchez-Martin, J. Teaching for a Better World. Sustainability and Sustainable Development Goals in the Construction of a Change-Maker University. *Sustainability* **2019**, *11*, 4224. [CrossRef]