THE ROLE OF UNIVERSITIES IN INNOVATION AND REGIONAL DEVELOPMENT

Findings of the RUNIN Project

RUNIN

The Role of **Universities** in **Innovation** and **Regional Development**

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Welcome

As President of the European Consortium of Innovative Universities (ECIU), I welcome you with great pleasure to the innovative training network's final report on the Role of Universities in Innovation and Regional Development (RUNIN). This report summarises the excellent results of 14 young PhD researchers who have, together with regional partners, investigated the role of universities in regional innovation processes and driving economic growth.

The researchers addressed important questions:

What drives academics and companies towards university-industry interaction?

How does university-industry interaction affect regional employability?

How does this interaction impact R&D partnerships and regional development?

What is the role of universities in creating innovation policies?

Which role does civil society play in regional innovation systems?

The RUNIN team examined these questions in different European regions. The ECIU member universities are located in six of these regions.

The ECIU universities share a history of fostering economic and social development in regions in transition. They were founded in regions where major industries had declined, such as textile, shipbuilding, and oil industries. The ECIU universities stem from regional needs to have highly educated people for the future economy and to develop new industries. Hence, the ECIU universities are not only regionally located, but also play an explicit role in boosting social-economic welfare in their regions.

As innovative universities, ECIU universities constantly challenge conventional models of education, research, and innovation. With launching the ECIU University in 2019, the ECIU network seeks to grow towards a joint future as one functioning, overarching European University. The

ECIU University nourishes strategic collaborations between cities, regions, industry, and citizens through a challenge-based approach in education, research, and innovation under the framework of SDG11 of the United Nations (Make cities and human settlements inclusive, safe, resilient and sustainable). This approach evidently differs from old models of viewing universities as singular entities. Hence, we consider the ECIU University as one player in an open European ecosystem of industry and SME's, learners, NGO's, regions, and municipalities.

We thank the RUNIN Team for all valuable insights into the role of universities in regional development. The results contributed to the ECIU Smart Regions Agenda and the concept of the ECIU University. The ECIU appreciates that the RUNIN team has identified best practices and policy recommendations that universities, firms, and regional stakeholders can adopt to improve regional innovation. We wish the research fellows, supervisors, and mentors all the best for the future.

Victor van der Chijs
ECIU President

> **Universities engage with various societal stakeholders, including firms, regional governments, voluntary associations, and citizens. They contribute not just to technological innovation, but also service, public sector, and social innovation.**

Main Partners

University of Stavanger

UNIVERSITY OF LINCOLN

AALBORG UNIVERSITY

Twente

universidade de aveiro

UAB — Universitat Autònoma de Barcelona

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GREATER STAVANGER

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Various societal actors are increasingly looking to partner with universities to increase their potential for innovation and solve broader societal challenges. Firms increasingly pursue open innovation strategies, using knowledge from a wide range of sources in their innovation processes. Public sector agencies need to do more with fewer resources, leading them to work more systematically with innovation than before. Governments look to partner with universities to support the development of policies based on new insights from scientific research. Although there are questions about the general public's continued faith in universities in light of growing populist movements, more and more young people go to university. Meanwhile, universities also have increasing ambitions to contribute to society. The rise of this so-called third mission and the development of models of the entrepreneurial university, the engaged university, or the innovative university all reflect these developments.

As a result, new forms of partnerships are emerging between universities and other societal actors around them. In contrast with the old, linear model, which saw the university as the main source of knowledge, these new forms of interaction involve collaboration between various actors in the development and use of knowledge. Collaboration is not just associated with the third mission of the university, but runs through all its missions: research funders expect universities to work with non-academic actors in the co-creation of knowledge, and educational authorities expect universities to work with employers to enhance the career relevance of their study programmes.

Due to the need for frequent and intense interaction, these partnerships often form at the regional scale. Although universities are global institutions and their academics are embedded in global networks with other researchers, their relationships with non-academic stakeholders are predominantly local or regional. Therefore, these partnerships are shaped by the regional context and vary across different territories.

In this innovative training network on the Role of Universities in Innovation and Regional Development (RUNIN), we have examined the various roles of universities in different regional contexts. It includes 14 PhD projects with researchers based in seven European regions: Aalborg (Denmark), Aveiro (Portugal), Barcelona (Spain), Lincoln (United Kingdom), Linköping (Sweden), Stavanger (Norway), and Twente (The Netherlands). The network is based on the European Consortium of Innovative Universities, an organisation of universities that actively seek to contribute to innovation in the regions where they are located. These regions are often relatively peripheral and distant from capital cities. Hence, the universities and regions studied in the project differ substantially from the contexts in which the regional role of universities is commonly studied.

The network has involved researchers in innovation studies, regional studies, higher education, entrepreneurship, economics, and public policy, allowing for a variety of disciplinary perspectives to be used in the analyses. It also includes close collaborations with regional development agencies or governments in each of the seven regions. The 14 PhD fellows have regularly spent time at these agencies, and interactions with regional stakeholders have been an integral part of the training weeks in each region.

The findings emphasise the multi-faceted nature of the role of universities in innovation and regional development. Universities engage with various societal stakeholders, including firms, regional governments, voluntary associations, and citizens. They contribute not just to technological innovation, but also service, public sector, and social innovation. In many cases, universities partner with regional governments to develop regional innovation and development policy, such as smart specialisation strategies. They interact for research, to provide education, and to perform broader third-mission activities.

Furthermore, universities are themselves loosely interlinked institutions consisting of relatively autonomous actors. They comprise academics, students, administrations, and senior management. These actors may have different interests and contribute independently to regional innovation processes. Hence, analysing universities as singular entities may not be appropriate.

Overview

All PhD fellows had a main partner as their home institution, and went on exchange visits to other project partners and regions. The fellows were grouped in four research themes.

PEOPLE AND NETWORKS

PhD no.	Name	Home institution	Research exchange
1	Eloïse Germain-Alamartine	Linköping	Barcelona
2	Rhoda Ahoba-Sam	Lincoln	Stavanger and Linköping
3	Gerwin Evers	Aalborg	Lincoln and Stavanger
4	Saeed Moghadam-Saman	Stavanger	Linköping

POLICIES AND INTERVENTIONS

PhD no.	Name	Home institution	Research exchange
5	Liliana Fonseca	Aveiro	Barcelona and Twente
6	Lisa Nieth	Regio and Uni. Twente	Aveiro and Aalborg
7	Maria Salomaa	Lincoln	Aveiro and Twente

PLACES AND TERRITORIES

PhD no.	Name	Home institution	Research exchange
8	Kwadwo Atta-Owusu	Stavanger	Twente
9	David Fernández Guerrero	Aalborg	Aveiro and Stavanger
10	Utku Ali Rıza Alpaydın	Stavanger	Aalborg

PRACTICES AND GOVERNANCE

PhD no.	Name	Home institution	Research exchange
11	Sergio Manrique	Barcelona	Stavanger
12	Sofya Kopelyan	Uni. Twente	Linköping and Aalborg
13	Rıdvan Çınar	Aveiro	Twente
14	Huong Nguyen	Barcelona	Aalborg

Home institution

Research exchange

MAIN PARTNERS
University of Stavanger
University of Aveiro
Aalborg University
University of Lincoln
Universitat Autònoma de Barcelona
Regio Twente
Linköping University
University of Twente

ASSOCIATED PARTNERS
Lincolnshire County Council
DEA
Intermunicipal Community of the Region of Aveiro
Greater Stavanger
North Denmark Region
East Sweden Region
Northumbria University
Parc de Recerca UAB

People and Networks

The research carried out under the theme of People and Networks has focused on the role of individuals and their networks in knowledge transfer between universities and industry – and society at large.

The four PhD projects addressed the role of people and networks from different, but interrelated perspectives. Rhoda Ahoba-Sam's work explored how academics' networks shape collaborations between universities and industry. The research has provided insights into how personal networks of academics and scientists are built and developed over time, with particular attention to the geographic perspective and the influence of institutional and regional contexts on knowledge exchange between individuals.

Whereas Ahoba-Sam's starting point was the academics, Gerwin Evers' point of departure was the university graduates, exploring the role of human capital production of universities for both firms and regional economic specialisation. Evers found that a university's contribution to regional development is limited by how much the university is related to the region's industrial specialisation.

Two projects shared a focus on doctoral education. Eloïse Germain-Alamartine's emphasis was on understanding the role of doctoral education in shaping universities' regional impact. Germain-Alamartine identified and explored challenging aspects related to the employability of PhD graduates, including labour market mismatches between their skills and job requirements, as well as positive developments in which continuous alignment with regional stakeholders can positively influence the employability of PhD graduates outside academia.

Saeed Moghadam-Saman focused on how doctoral researchers' collaborations with non-academic sectors helped them acquire different types of generic and transferable skills, and how disciplinary affiliations influenced the possibilities of being engaged in such collaborations. Moghadam-Saman suggested that transferable skills are best learned in connection with discipline-specific knowledge, implying that developing such skills would benefit PhDs more if organised at the faculty rather than university level.

All four projects demonstrated the potentially important role of universities in the socio-economic development of their home regions. The projects showed the diversity of relationships that universities can have with their surroundings, and how actors can learn from and develop each other.

PhD Fellows in People and Networks

ELOÏSE GERMAIN-ALAMARTINE

Thesis theme
Doctoral education in the entrepreneurial university: enhanced employability?

Host Institution
Linköping University

Supervisor
Magnus Klofsten, Linköping University

Co-supervisor
Pere Ortin, Universitat Autònoma de Barcelona

External Mentor
Peter Larsson, East Sweden Region

RHODA AHOBA-SAM

Thesis theme
Microfoundations of academics' networks: initiation, evolution and context

Host Institution
University of Lincoln

Supervisor
David Charles, University of Lincoln & Northumbria University

Co-supervisor
Dzamila Bienkowska, Linköping University

External Mentor
Justin Brown, Lincoln City Council

GERWIN EVERS

Thesis theme
The role of university-industry interaction for regional industrial development: research collaborations and graduate human capital as complementary university-industry knowledge transfer channels

Host Institution
Aalborg University

Supervisor
Christian R. Østergaard, Aalborg University

Co-supervisor
Rebecca Herron, University of Lincoln

External Mentor
Maria Theresa Norn, DEA Think Tank

SAEED MOGHADAM-SAMAN

Thesis theme
Intersectoral collaborations of doctoral researchers and generic skills acquisition – A critical realist inquiry

Host Institution
University of Stavanger

Supervisor
Bjørn Asheim, University of Stavanger

Co-supervisor
Magnus Klofsten, Linköping University

External Mentor
May Endresen, Greater Stavanger

People and Networks

Main Findings and Recommendations

The research findings under the People and Networks theme have implications for university governance, regional industries, and regional policymakers.

The findings emphasise that universities' contributions to innovation and regional development do not happen automatically. From a meso-level perspective, the extent to which universities can play a role in the economic development and, if required, the revival of their regions depends on the degree of relatedness between academic activities at universities and the industrial specialisations that are prevalent in their regions.

Academics' networks tend to evolve in line with regional comparative advantages. Therefore, it is imperative to encourage regional policies that promote the co-evolution of regional networks and business formation. The relevance of regional context in promoting academic research agendas is directly linked to the competitive strength of academics' networks for the region's benefit.

At the micro-level, concerning supporting knowledge exchange between universities, industry, and other non-university employers, it is essential to develop different types of proximities to regional employers, including a method to collect needs of and feedback from regional employers regarding the human and social capital developed at universities.

Inviting industry actors to help designing collaborative schemes is also necessary to strengthen intersectoral collaborations during doctoral education. However, such schemes should consider the heterogeneity of academic disciplines in terms of their receptivity to different policy tools. For some disciplines, due to their inherent cognitive and epistemological nature, introducing interdisciplinarity can be the primary option for improving capacities to engage with industry actors. Other disciplines would be helped more by improving the organisational and institutional aspects of the collaborations. When it comes to learning generic (transferable) skills through collaborative schemes during doctoral education, their co-development with disciplinary knowledge appears to be a key condition.

Eloïse Germain-Alamartine during a poster session in Stavanger in 2020.

Lisa Nieth, David Fernández Guerrero, Gerwin Evers and Saeed Moghadam-Saman in a group exercise in Enschede in 2018.

Eloïse Germain-Alamartine and Rhoda Ahoba-Sam at the Geography of Innovation Conference 2020.

Eloïse Germain-Alamartine
Doctoral education in the entrepreneurial university: enhanced employability?

CONTACT DETAILS

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SUMMARY OF THE PROJECT

This project explored the employability of doctorate holders through the theoretical lens of the entrepreneurial university model. It started with the observation of a bottleneck in the academic labour market in many countries, making it increasingly difficult for recent doctoral graduates to engage in an academic career. Traditionally, doctoral education was designed for a career in academia. However, the employment situations of doctorate holders call for more relevance of doctoral education and doctoral-level skills to the non-academic labour market. The openness and interactions of the entrepreneurial university with its environment, particularly its region, make it a relevant model to enhance doctorate holders' employability outside academia. The project has contributed to the literature on the entrepreneurial university by focusing on doctoral students and doctorate holders, doing so at the crossroads of its three missions (education, research, and 'third mission'). It also suggests practical recommendations to different stakeholders (see below).

OVERVIEW OF RESULTS

Three main research findings can be highlighted: (i) the entrepreneurial university increases its socioeconomic impact by building an alignment with regional stakeholders over the years and, thanks to key individuals, by retaining human and social capital within itself and by broadening the scope of its activities and stakeholders; (ii) doctorate holders' employability is key in the entrepreneurial university's regional socioeconomic impact, as they are increasingly employed outside academia where they are likely to experience job mismatches, mainly related to education and skills; and (iii) regional stakeholders can take different types of initiatives to enhance the employability of doctorate holders and increase the entrepreneurial university's socioeconomic impact: more specifically, doctorate holders and non-academic employers can get to know each other better; and intermediaries such as Science Parks can support them by creating meeting places.
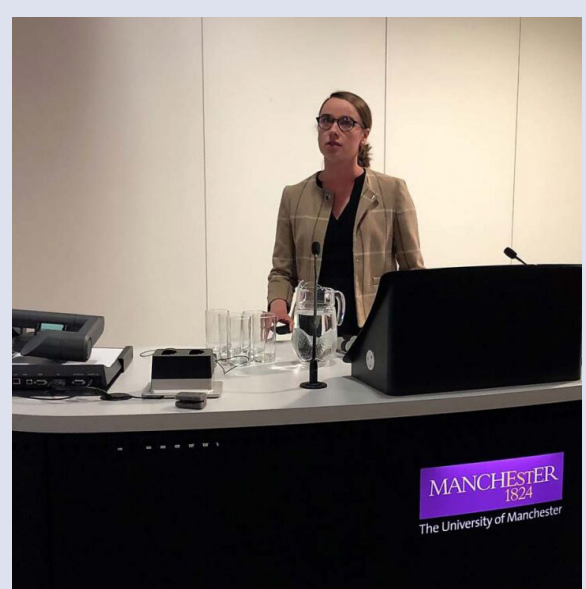
Eloïse presenting at the Triple Helix Conference in Manchester in September 2018.

CURRENT ACTIVITIES

Eloïse currently works at CEA in France as an administrative coordinator for two Horizon 2020 projects involving industrial partners, research institutes, and universities, focusing on developing innovative energy storage systems.

KEY PUBLICATIONS

Germain-Alamartine, E. (2020). Doctoral education in the entrepreneurial university: enhanced employability? (Doctoral dissertation). Linköping Studies in Science and Technology, Dissertations, No. 2043. Linköping: Linköping University.

Germain-Alamartine, E., & Moghadam-Saman, S. (2020). Aligning doctoral education with local industrial employers' needs: A comparative case study. European Planning Studies, 28, 234–254.

Germain-Alamartine, E. (2019). Doctoral education and employment in the regions: The case of Catalonia. Regional Studies, Regional Science, 6, 299–318.

Policy Recommendations

IMPLICATIONS FOR	RECOMMENDATIONS
Entrepreneurial university management	Create career centres for doctorate holders to support them in their transition to work after graduation and brand doctoral education to employers. Develop different types of proximities to regional employers and a process to collect needs and feedback on the provided human and social capital. Create an institution dedicated to watching for ad-hoc or spontaneous initiatives, providing support to them or institutionalising them.
Regional employers	Learn about doctoral education and its advantages for you, especially in terms of human and social capital. Develop different types of proximities to the nearest university and engage in communication of needs and feedback on the provided human and social capital. Be willing to open your doors, such as through temporary placements, and engage in initiatives to enhance doctorate holders' employability.
Doctoral students in the entrepreneurial university	Enhance your employability and learn how to 'sell' your skills to employers. Learn about your different career possibilities. Start initiatives yourselves to fill the gaps you might experience.
Other regional stakeholders	Implement policies supporting the recruitment of doctorate holders outside academia. Organise regional PhD career fairs. Create intermediaries dedicated to SSH PhDs, creating balance with the support existing for STEM PhDs.

Rhoda Ahoba-Sam
Microfoundations of academics' networks: initiation, evolution and context

CONTACT DETAILS

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SUMMARY OF THE PROJECT

This project focused on exploring foundational aspects of networks by spotlighting individual academic scientists and their network ties. This project assumed a determined stance in which individual academic scientists were conceptualised as the critical factors in knowledge exchange collaborations. Additionally, the project surmised that knowledge collaborations are embedded within networks stemming from both university and industry entities. Indeed, individuals who are critical to their regions' competitiveness do not act in isolation – they network. However, existing research on university-industry collaborations (UICs) mainly focuses on the organisational level. While networking forms a critical aspect of theories on regional innovation, networks are rarely the focus in studies on regional innovation.

Consequently, the aim was to investigate how individual academics' personal contacts could shape their knowledge exchange networks. To this end, the study assumed a tripartite nature in which the initiation, evolution, and context of academics' networks were explored. The analysis was based on 100 semi-structured interviews with academic scientists and other relevant stakeholders in the knowledge exchange process. An attempt was made to obtain insight into networking as embedded in academic engagement.

OVERVIEW OF RESULTS

Overall, this thesis has yielded insight into (i) how the personal networks of individual academics are built, especially from a geographic perspective in which motivations are linked to regional and extra-regional incentives; (ii) how the networks of individual academic scientists evolve and what factors influence this process; and (iii) the effect of the institutional and regional contexts on knowledge exchange processes as they occur in academics' networks.

Academic scientists exhibited an ambidextrous capacity to switch between effectuation and causation, depending on the circumstances. This capacity seemed to have been necessitated by the heterogeneous makeup of their network ties: the level of ties (individual or project-based), type of ties (industry or academic), and geography of ties (local or international). This adaptability enables academic scientists to initiate and maintain ties with different contacts.

The motivations of academic scientists to engage locally were linked to regional advantages. When these advantages are present, academics explore local networks, and when the advantages are absent, academics go international. Importantly, local and international networks are interlinked; local networks need international networks as sources of new knowledge, and international networks find places of relevance and application through local networks.

Universities' management appeared to struggle with the specification of engagement and mechanisms for co-ordinating engagement. Other chasms that need addressing are a lack of (adequate) institutional support for academics' external engagement activities and the apparent absence of dialogue between university management and their academic scientists.

POLICY RECOMMENDATIONS

From a policy perspective, governments have encouraged UICs with the view that these interactions are critical for

Rhoda presenting her research during the project's mid-term review meeting with the European Commission.

Poster session with regional stakeholders in Brussels in September 2018.

regional development. Where UICs are encouraged, academics' ability to adapt and work with varied stakeholders is critical. This suggests that academics must be predisposed to continually diminishing the perceived boundaries between academia and society by being able to work with individuals from either side. This ability is vital for embedding regional relationships.

Industry partners must allow enough flexibility when collaborating with academic scientists. Setting stringent objectives in collaborative projects will limit academic partners in exhibiting the necessary ambidexterity for switching between causality and effectuation.

Local networks should be encouraged to their benefit:
a) Governments are encouraged to forge a stronger link between global and local networks. This link would strengthen regional competitiveness
b) To initiate policies that promote a co-evolution of businesses and local networks
c) To promote and encourage broad stakeholder involvement in participating in and addressing the challenges of academic engagement.

The university management is encouraged to:
1. Build more transdisciplinary spaces
2. Put in place systems that enhance better communication among universities' stakeholders.
3. Implement better approaches towards supporting academic engagement

CURRENT ACTIVITIES
Rhoda is based in Norway and works as a Business Development Manager for a start-up company (Wattero AS) in the Oslo area. She is also a Visiting Researcher to the University of Lincoln, UK.

KEY PUBLICATIONS
Ahoba-Sam, R., & Charles, D. (2019). Building of Academics' Networks—An analysis based on Causation and Effectuation theory. Review of Regional Research, 39, 143–161.

Ahoba-Sam, R. (2019). Why do academics engage locally? Insights from the University of Stavanger. Regional Studies, Regional Science, 6, 250–264.

Germain-Alamartine, E., Ahoba-Sam, R., Moghadam-Saman, S., & Evers, G. (2020). Doctoral graduates' transition to industry: Networks as a mechanism? Cases from Norway, Sweden and the UK. Studies in Higher Education, DOI: 10.1080/03075079.2020.1754783

Gerwin Evers

The role of university-industry interaction in regional industrial development: research collaborations and graduate human capital as complementary university-industry knowledge transfer channels

CONTACT DETAILS

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SUMMARY OF THE PROJECT

The relevance of the university as a centuries-old institution has been renewed with the rise of the knowledge-based economy. Through interaction with their environment via various channels, universities can have an impact on their region by providing both public and private actors access to knowledge and requisite human capital. This project aimed to provide insight into how this impact can be realised through the university-industry knowledge transfer channels of graduate human capital and research collaborations by answering the following question:

What is the role of university-industry research collaborations and graduate production in the impact of universities on regional industrial development?

The insights are based on analyses of Danish micro-level data, Community Innovation Survey data, interview data, and other data using various empirical techniques. The results highlight the importance of universities' alignment with regional industries to foster their ability to contribute to regional industrial development. Furthermore, the results argue for taking a comprehensive approach to the university-industry knowledge transfer channels, as utilising potential synergies between human capital production and research collaborations can increase the impact of universities on regional industrial development.

OVERVIEW OF RESULTS

The results highlight the importance of the specific characteristics of regional contexts in relation to the impact of universities on regional industrial development. The studies included in this project indicate that universities can play an important role in revitalising regions by supporting the development of new economic strengths. However, the chosen strategy needs to align with existing regional strengths. The results also point at the importance of human capital in the context of university-industry collaborations. Collaborating companies appear to be more likely to hire university graduates, with a specific emphasis on graduates who received their degree from their university partner.

POLICY RECOMMENDATIONS

While universities can play a role in the economic revival of their regions, its extent depends on how much the university is related to the industrial specialisation prevalent in their region. Failing to achieve this relatedness likely reduces the potential contribution of universities to regional industrial development. The results argue in favour of a comprehensive approach in which research collaborations and graduate human capital are treated as two interdependent channels. Furthermore, they emphasise that university-industry knowledge transfer is, in many cases, not an automatic process. Knowledge transfer can benefit from deliberate action by both private and public actors to overcome these hurdles. Finally, no miracles should be expected from university-industry interaction regarding regional industrial development. First and foremost, universities are research and educational institutions. However, the increased call to develop a third mission does not necessarily pose a conflict. This project emphasises that the missions of universities are not an equal-sum game. The third-mission activities of universities, such as research collaborations, can contribute to their educational mission by increasing employment opportunities for graduates. The uptake of graduates in industry in turn can support the further development of the third mission activities. Through these co-evolutionary dynamics, the potential of universities to contribute to regional industrial development can be unlocked.
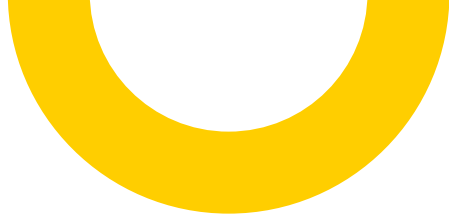
World Café setting at a RUNIN Think Tank event in DesignLab Twente.

CURRENT ACTIVITIES

Gerwin works as a Science and Innovation Policy Consultant at the Technopolis Group in Amsterdam, The Netherlands.

KEY PUBLICATIONS

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

Fernández Guerrero, D., & Evers, G. (2018). Co-creation of localised capabilities between universities and nascent industries: The case of Aalborg University and the North Denmark region. RUNIN Working Paper Series, 03/2018. DOI: 10.3990/4.2535-5686.2018.03

Evers, G. (2020). The role of university-industry interaction in regional industrial Development: Research collaborations and graduate human capital as complementary university-industry knowledge transfer channels. PhD thesis. Aalborg: Aalborg University Press.
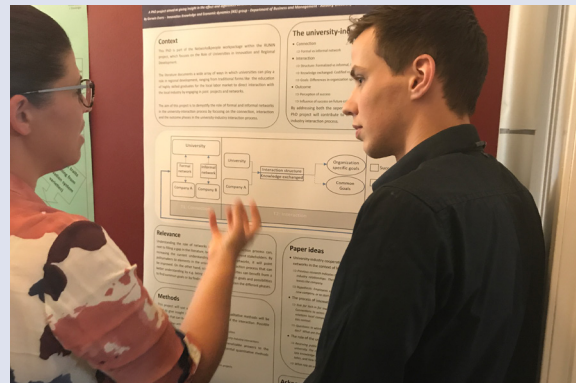
Gerwin explaining his research at a workshop organised by Center for Regional Development in Aalborg.

Poster session in Brussels in 2018.

Saeed Moghadam-Saman
Intersectoral collaborations of doctoral researchers and generic skills acquisition – A critical realist inquiry

CONTACT DETAILS

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SUMMARY OF THE PROJECT

This project is positioned within the academic field of innovation systems. It has contributed to the literature on university-industry relationships, focusing on collaborative relations between doctoral researchers and industry. The overall aim of the project was to investigate how doctoral researchers can be prepared for more diverse career prospects rather than the traditional dominance of academic careers by acquiring generic or transferable skills based on engagement in intersectoral collaborations during doctoral education. Together, the four project papers form a stepwise inquiry into the rationale, essence, prevalence, and outcome of collaborative doctoral programmes as a mechanism for addressing the current concerns about doctoral education. The introductory chapter of the dissertation provides a review of earlier research both from a broader perspective of university-industry relationships and a more focused perspective of collaborative doctorate programmes and doctoral skills.

OVERVIEW OF RESULTS

The project results can be summarised as follows: (i) doctoral graduates face challenges in convincing industrial employers of their professional skills, as their skillsets are sometimes deemed too focused, and their attitude is perceived as less flexible. However, among doctoral graduates, those who have experienced collaborative doctorate programmes such as Industrial PhD are often preferred by industry parties; (ii) the systemic attributes of the intra- and intersectoral relations in which university-industry collaborations materialise influence the nature and efficiency of those collaborations around doctoral training. A higher level of consensus among the system actors facilitates the practice-based acquisition of transferable skills for doctoral students; (iii) the extent to which affiliation with a specific academic discipline affects doctoral researchers'

opportunities for intersectoral collaboration can vary across country contexts depending on the disciplinary groups. Regarding the four Scandinavian universities studied, hard-applied and soft-pure disciplines appeared more susceptible to the influence of contextual (local) factors; (iv) the cognitive interrelation between some of the generic skills and the discipline-specific skills proves to be so strong that it makes parallel and balanced development of generic and disciplinary skills more important.

POLICY RECOMMENDATIONS

Higher education policies targeting the improvement of intersectoral collaborations during doctoral education need to consider the heterogeneity of academic disciplines regarding their receptivity of different policy tools. Due to some disciplines' inherent cognitive and epistemological nature, introducing interdisciplinarity can be the primary option to improve their capacity to engage with industry parties. For some other disciplines, improving the organisational and institutional aspects of their collaborations would help more. When it comes to learning generic (transferable) skills through collaborative schemes during doctoral education, their co-development with any disciplinary knowledge seems to be a key condition. This finding implies that for enriching doctoral education by providing doctoral candidates with a comprehensive set of generic skills, there is a need for more intensive industry involvement in the design of collaborative schemes. Moreover, facilitating industry involvement needs to be done at the level of academic departments or faculties rather than graduate schools at the university level. This condition also implies that programmes and courses teaching generic skills would deliver better results if they would be designed at the faculty or department level rather than the university level, thereby better facilitating their adjustment with disciplinary specifics.
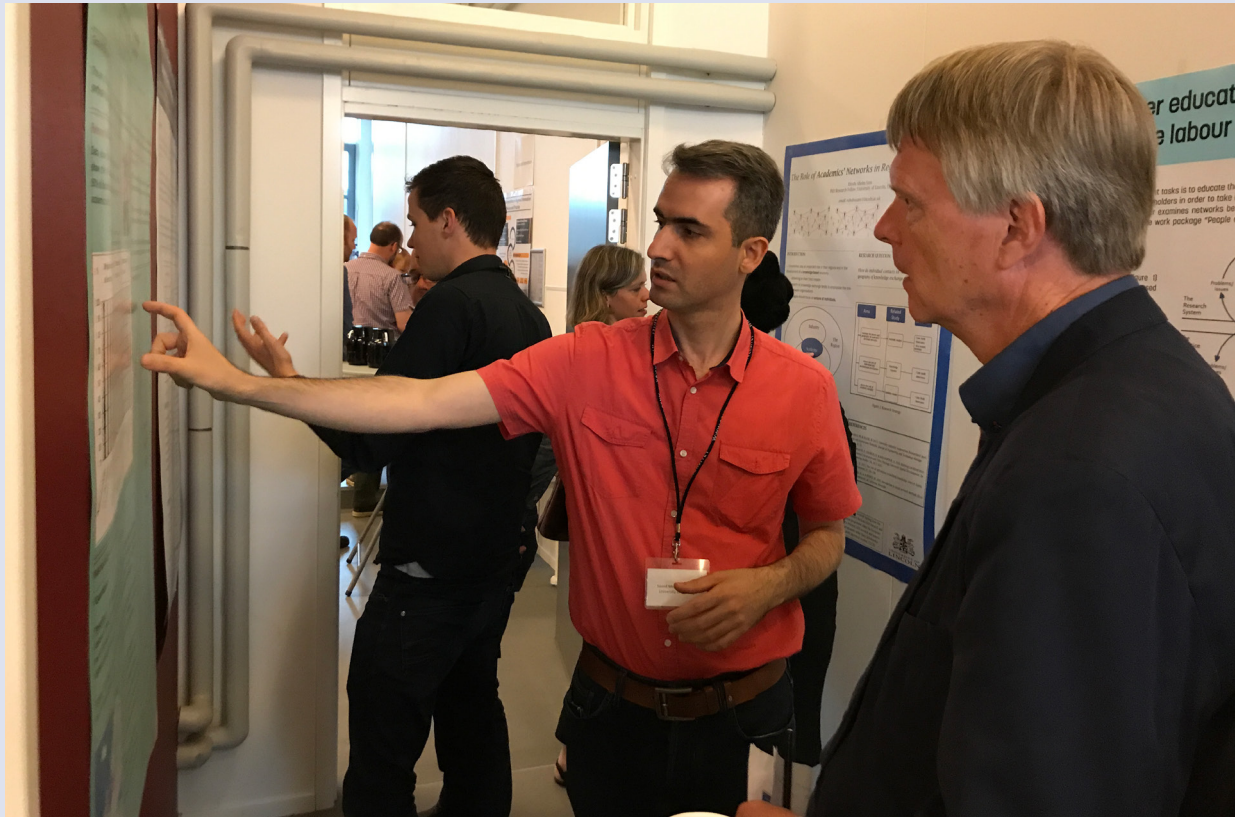
Saeed and the Aalborg-based Associate Professor Jesper L. Christensen at a poster session in 2017.

CURRENT ACTIVITIES
Saeed is a Research Fellow at the Mohn Centre for Innovation and Regional Development of the Western Norway University of Applied Sciences (HVL) in Bergen.

KEY PUBLICATIONS
Moghadam-Saman, S. (2019). Collaboration of doctoral researchers with industry: A critical realist theorization. Industry and Higher Education, 34, 36–49.

Moghadam-Saman, S. (submitted). Intersectoral engagement of doctorands: Regime discrepancy between the academic territories.

Moghadam-Saman, S. (to be submitted). How collaborative doctoral programmes foster acquisition of generic skills? – Professional doctorate versus industrial PhD.

Saeed talking to a conference participant by the RUNIN stand at the GeoInno2020 conference.

Policies and Interventions

The central question of the research on Policies and Interventions concerns how universities interact with regional policymakers. These three studies have gone beyond simplistic ideas of triple helices or third missions to analyse the ways in which universities and regions as two complex systems interact in multiple dimensions. The focus is thus on the spaces of interaction between universities and regional policy, the forms of collaboration, and institutional structures, the spaces of shared place leadership, and the ways in which regional development funding shapes the entrepreneurial university.

Whilst delivered through three PhD projects, this grouping involved considerable collaboration with joint work in three regions, Lincolnshire (UK), Twente (Netherlands), and Aveiro (Portugal), as well as individual research in Vallès Occidental (Spain), North Jutland (Denmark) and Satakunta (Finland). The three PhD fellows collaborated on several publications drawing on a base of over 200 qualitative interviews, giving rich material for both the joint work and individual publications.

Liliana Fonseca examines the ways in which universities interact with regional government authorities around regional innovation strategies. This particularly includes the roles universities have played in smart specialisation strategies developed through the use of the European Structural Funds. In peripheral and less-developed regions universities are expected to take on a leading role, developing a wide range of capabilities and structures going beyond that of knowledge provider to be an agent of change. These actions have been important to boost innovation networks in these regions.

Lisa Nieth focuses in on the place leadership coalitions and the role of institutional entrepreneurs. By opening the black box of the coalition and examining the organisational dynamics and the ways in which universities seek to influence coalitions, the research draws out the importance of alignment on the basis of a shared actionable knowledge base.

Maria Salomaa investigates instead the ways in which universities interact with European Structural Funds: how the funds shape the regional engagement of the universities, and their attempts to be entrepreneurial, and how the organisation and culture of the university responds to the opportunities presented by the funds and their constraints.

PhD Fellows in Policies and Interventions

LILIANA FONSECA

Thesis theme
The Role of Universities in Regional Innovation Policies and Practice

Host Institution
University of Aveiro

Supervisor
Carlos Rodrigues, University of Aveiro

Co-supervisor
Joan Lluis Capelleras,
Autonomous University of Barcelona

External Mentor
José de Matos, CIRA

LISA NIETH

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

Host Institution
University of Twente & Regio Twente

Supervisor
Paul Benneworth, University of Twente &
Western Norway University of Applied Sciences

Co-supervisor
David Charles, University of Lincoln
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External Mentor
Inge Bakker, Regio Twente

MARIA SALOMAA

Thesis theme
University Third Mission in Rural Regions: A comparative
analysis on university engagement through the Structural
Funds programmes in the UK, Finland and Portugal

Host Institution
University of Lincoln

Supervisor
David Charles, University of Lincoln
& Northumbria University

Co-supervisor
Ana Daniel, University of Aveiro

External Mentor
Justin Brown, Lincolnshire County Council

Policies and Interventions

Main Findings and Recommendations

The main findings and policy implications from these three projects are focused on policymakers at national and regional levels and the universities themselves.

Inevitably a key area of discussion in all three studies is focused on the way in which regional policymakers develop strategic policy frameworks and involve universities as key actors. Universities are expected to make a regional contribution and are generally keen to do so, but policymakers need to do more to align regional and university assets and capabilities. Ways need to be found to ensure that universities develop capabilities to meet regional needs, but at the same time enhance the capabilities of the universities in meeting their other missions. A better understanding of the two sides is central to this and this can be facilitated by the establishment of opportunity spaces for co-creation. More flexibility in funding schemes is needed to assist in the development of new ideas for university-based actions, whilst also continuing to support those projects that are effective, rather than changing the rules of funding for arbitrary reasons.

Universities need to consider how they support regional engagement through the training and development of their staff at all levels, around engagement across all of their activities including teaching and research. They also need to do more to support staff at all levels of the organisation whether it be around bottom-up leadership in regional projects or ensuring they participate in the design of Structural Funds projects. At present much engagement is either ad hoc or managed by senior managers or specialists and is not fully embedded across the institutions, limiting the potential for effective regional contribution.

Overall, there is a need for greater joining up of regional policy objectives and the university mission, at all levels of governance. Often difficulties emerge from conflicting aims at one or other level: there may be alignment at local level, but not at national, or even EU level, or vice versa. EU and national policies need to support the local partnerships and not impose top-down approaches that hinder effective engagement.

Lisa Nieth discussing her research objectives with a participant at an event in Brussels.

Lisa Nieth, Liliana Fonseca and Maria Salomaa presenting their theme for their peers during the RUNIN Training Week in Aalborg in June 2017.

Inge Bakker from Regio Twente giving input to Liliana Fonseca in 2018.

Liliana Fonseca
The role of universities in regional innovation policies and practice

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SUMMARY OF THE PROJECT

The contribution of universities to regional innovation and development has been greatly extended in the literature in recent years. Aside from their primary functions of teaching and research, the third mission of engagement with external partners is increasingly emphasised. This mission includes engagement in regional innovation policies and is paralleled by a push in the planning and innovation sphere to integrate an interconnected web of expert regional actors in strategy processes. Cooperation is becoming commonplace between local government bodies and higher education institutions to design regional development plans, demonstrating universities' amplified area of intervention and their growing regional responsibility.

This project sought to understand how universities engage with regional government authorities in the design of regional innovation and development strategies, and how, through this engagement, they can contribute to the regional innovation system. The project has mapped the range of activities in which universities are involved and the institutional and organisational challenges they face while engaging in policy formulation across varying regional contexts. The research followed a qualitative methodological approach and a multiple case-study design across three universities and their regions: the University of Aveiro (Centro, PT), the Autonomous University of Barcelona (Catalonia, ES), and the University of Twente (East Netherlands, NL).

OVERVIEW OF RESULTS

The project has focused on:
 • How and under which conditions universities can effectively engage in the regional innovation policy arena;
 • How universities can support regional innovation dynamics in their engagement with innovation policy;
 • If and how regional innovation policy affects universities' institutional and organisational structures;
 • How and under which conditions universities can address regional needs and further innovation goals in different regional contexts.

The findings suggest that universities in less-developed or peripheral regions – characteristically institutionally thin – tend to be a foreground player in strategy processes because they are a key institutional partner. Effective engagement between universities and regional government is stimulated by enabling dialogue and aligning expectations, resources, capacities and a regional vision. Universities can fulfil a diverse set of roles in the regional policy process, such as mobilising actors, mediating negotiations, promoting institutional capacity-building, and matching assets. Regional innovation policy and its overarching framework affect universities' organisational and institutional structure and positioning, leading to the emergence of new support structures of engagement. Facilitating alignment and agency and providing the resources, institutional support, and collaborative spaces necessary for dialogue are essential to stimulate a regional outlook.

CURRENT ACTIVITIES

Liliana is a PhD candidate in Public Policies at the University of Aveiro in Portugal and Research Assistant at the European Policies Research Centre of the University of Strathclyde, UK.

KEY PUBLICATIONS

Fonseca, L., & Salomaa, M. (2020). Entrepreneurial universities and regional innovation: Matching smart specialisation strategies to regional needs? In A. Daniel, A. Teixeira, & M. Preto (Eds.). Examining the role of entrepreneurial universities in regional development (pp. 260–285). Hershey, PA: IGI Global.

Fonseca, L., Rodrigues, C., & Capelleras, J.-L. (2020). The organizational adaptation of universities to smart specialization: The emergence of strategic network interface units. European Planning Studies. DOI: 10.1080/09654313.2020.1854188

Fonseca, L., & Nieth, L. (in press). The role of universities in regional development strategy processes: A comparison across actors and policy stages. European Urban and Regional Studies.

Effective engagement between universities and regional government is stimulated by enabling dialogue and aligning expectations, resources, capacities and a regional vision.

Policy Recommendations

CHALLENGE	RECOMMENDATION
Promoting regional academic engagement with policymakers	University managers and policymakers must consider financial gains and local engagement versus international recognition for academic engagement, as these factors are relevant to activating university and individual academic leadership. Need to consider training in regional engagement, pedagogical and developmental approaches in collaboration, and reflecting this in academic career evaluation.
Creating and enabling a policy framework or strategy process that can facilitate the matching of university assets and capacities to regional needs	A policy framework linking research and innovation to regional needs (e.g. smart specialisation) can promote university-region collaboration and maximise resources and networks. A strategic focus on areas of regional economic relevance can potentiate universities' engagement activities and innovation-related impact in the territory. Inclusion of collaborative methodologies in regional engagement repertoires can further relational and cognitive proximity.
Activating universities' regional engagement and leadership	Promotion of bottom-up leadership within the university to enable internal discursive cohesion and externally directed action. Similarly, creating the (policy) space for universities to engage in regional processes.
Enabling effective university collaboration and participation in regional innovation strategy processes	Clarification of universities' needed input in regional strategy processes for easy collaboration.

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

SUMMARY OF THE PROJECT

There is a widespread assumption amongst regional policymakers and practitioners that successful innovation policies depend upon place leadership from coalitions of actors. These coalitions, consisting of actors from different organisations such as regional authorities, companies or universities, are assumed to work together seamlessly and develop and enact collective innovation agendas that ultimately lead to regional (path) development. The university is one important actor and contributor to these coalitions due to its key role as a knowledge producer and distributor. This project analysed how the organisational dynamics and particularities of universities influence their participation in these regional coalitions and their contributions to collective regional innovation policy processes. More specifically, the project focused on specific acts of institutional entrepreneurship of university employees that can have more structural effects and address the institutional thinness of peripheral regions.

OVERVIEW OF RESULTS

The main finding of this project is the need for alignment as the basis for creating a shared actionable knowledge base. Additionally, two alignment circuits (see Figure below) are essential for institutional entrepreneurs to contribute to regional (path) development. The first circuit relates to the alignment of the diverse regional actors, and the second to the internal alignment of university stakeholders, including the strategic centre, the functional departments, and academic departments. It is evident that universities have links at different organisational levels and interact with various external partners, thus creating a dynamic and unpredictable framework. Ultimately, alignment can empower university institutional entrepreneurs to address regional challenges. It should be considered that individuals are shaped by a range of contexts that are not just organisational or operational but are built into a complex interplay between the two.
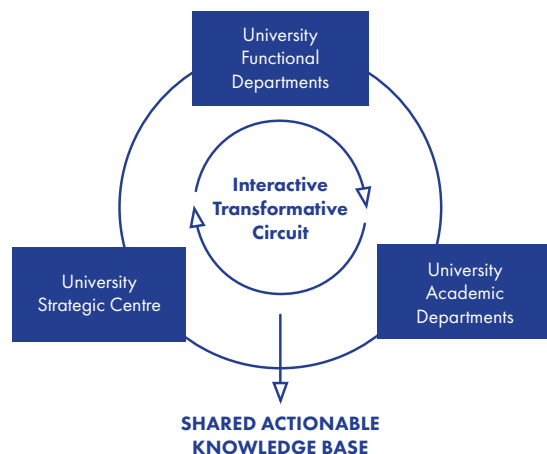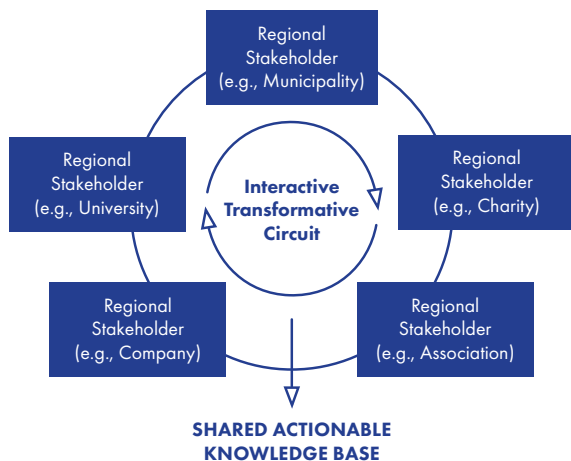
Regional Stakeholder (e.g., Municipality) · Regional Stakeholder (e.g., University) · Regional Stakeholder (e.g., Charity) · Regional Stakeholder (e.g., Company) · Regional Stakeholder (e.g., Association) · Interactive Transformative Circuit · **SHARED ACTIONABLE KNOWLEDGE BASE**

University Functional Departments · University Strategic Centre · University Academic Departments · Interactive Transformative Circuit · **SHARED ACTIONABLE KNOWLEDGE BASE**

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> **It is evident that universities have links at different organisational levels and interact with various external partners, thus creating a dynamic and unpredictable framework.**

Policy Recommendations

IMPLICATIONS FOR	RECOMMENDATION
Regional policymakers	Find new or better ways to empower regional changemakers and institutional entrepreneurs and encourage the alignment of interests between regional partners and within organisations. Create activities, programmes, or initiatives that allow regional actors to get to know each other and enhance the understanding of each other's similarities, differences, and interests. Create an apparatus that allows academics to translate intangible ideas into deliverable, tangible outcomes. Create opportunity spaces for regional stakeholders to co-create and test ideas. Continue providing support, even during complicated phases, as the partners might need some time to re-focus.
University management	Create structures that allow institutional entrepreneurs to enact their regional roles and facilitate internal alignment processes. Support the bottom-up agency of university institutional entrepreneurs, which enhances credibility and plausibility for university managers and opens the opportunity to provide regional leadership roles. Protect academic agents (institutional entrepreneurs) from diverse pressures to ensure they can exert regional agency.
National / supranational policymakers	Policy concepts often reduce university contributions to a set of sequential steps and are often simplified or broken down into stepwise processes. However, there are no universal guidelines because regions—as well as their organisations and individuals within those organisations—have to "find" their own approach.

Maria Salomaa

University third mission in rural regions: a comparative analysis on university engagement through the Structural Funds programmes in the UK, Finland and Portugal

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SUMMARY OF THE PROJECT

This research has built on the evolution of the 'entrepreneurial university' towards a more context-sensitive assessment of university engagement using previous studies regarding the universities' role in delivering regional development projects funded through Structural Funds (SF) programmes. The study sought to explore how (entrepreneurial) universities can manage and deliver their third mission through SF programmes in rural regions. The qualitative analysis focused on the specific characteristics and challenges of university-led SF activities and the impact of a rural region on the overall university engagement. These issues were studied using three case studies representing regionally-focused universities located in sparse innovation environments in the UK, Finland and Portugal. The research has filled in a gap in the academic literature by generating new knowledge on the organisation of university-led SF projects and their alignment with the third mission at universities located in these remote regions. A rural region's impact on the overall university engagement was assessed, suggesting that a more context-sensitive approach to the university's entrepreneurial architecture is needed. Moreover, a stylised typology of four university-led SF project types was derived based on the empirical evidence from all case studies.

OVERVIEW OF RESULTS

The findings indicate that particular contexts could have a major impact on all dimensions of the university's Entrepreneurial Architecture and the overall university engagement. A rural context steers the university's institutional responses towards the third mission, especially through establishing a wide range of structures to compensate for the absence of other knowledge institutions in the region – excluding the small-scale remote units with fewer resources to establish entrepreneurial interface structures.

The findings imply that an unused potential exists for optimising regional and academic benefits from the SF activities. However, challenges remain related to national and regional adaptations of the Cohesion policy in designing programmes, the capacity of university organisations to make use of this type of funding efficiently, regional and institutional communications systems stimulating collaboration with regional actors, and the lack of a strategic approach to designing SF projects within universities. The empirical evidence indicates that the role of the universities in regional development is context-dependent. The series of case studies revealed that alignment of the SF activities and the third mission is possible, but many challenges currently hinder maximising outputs from these activities at policy and institutional levels.

POLICY RECOMMENDATIONS

The findings from all three case studies imply that unused potential exists in strengthening universities' role in regional development through the Structural Funds Operational Programmes (SF OPs). Large-scale university-led SF projects can be efficient in increasing engagement with local businesses and the level of Research, Development and Innovation (RDI) investment. However, academic staff members should be more involved in the design phase to

Maria receiving input on her research during an event in Brussels.

"How can the university practically include societal needs in current and future research projects?" was one of the questions sought to be answered at the World Café session at the Think Tank event in Enschede in 2018.

ensure high-quality implementation and possibilities to initiate long-term university-business collaborations. An even more significant challenge is that the objectives set for regional policies do not necessarily match national higher education agendas, yet universities are expected to contribute to the implementation of the SF programmes.

More diverse national and regional adaptations of the SF OPs are needed:
• Universities' contributions could be perceived more broadly in building RDI activities related to regional priority sectors, generating traditional outputs in the long term, such as new jobs and businesses.

• Targeted schemes can motivate universities to engage more with SF OPs like tailored R&D services or training to local businesses.

In addition, the university's regional contributions through SF programmes could be reinforced by:
• Initiating joint calls with national science foundations, a combination of applied and basic research.

• Promoting cross-regional collaboration opportunities.

CURRENT ACTIVITIES
Maria works as an RDI specialist at Tampere University of Applied Sciences in Finland and is a Visiting Research Fellow at Lincoln International Business School in the UK.

KEY PUBLICATIONS
Salomaa, M., & Charles, D. (in press). The university third mission and the European Structural Funds in peripheral regions: Insights from Finland. Science and Public Policy. DOI: 10.1093/scipol/scab003.

Salomaa, M. (2019). Third mission and regional context: Assessing universities' entrepreneurial architecture in rural regions. Regional Studies, Regional Science, 6, 233–249.

Salomaa M., Fonseca L., Nieth L., & Benneworth P. (2020). The role of universities in building dense Triple Helix ecosystems in sparse regional environments. In L. Farinha, D. Santos, J. Ferreira, & M. Ranga. (Eds.). Regional Helix Ecosystems and Sustainable Growth. Studies on Entrepreneurship, Structural Change and Industrial Dynamics (pp. 11–29). Switzerland: Springer, Cham.

Places and Territories

The research on Places and Territories examined university-industry interactions from a spatial perspective. This theme included studies of how firms and academics interact with partners at various scales and proximity levels, and how the return to such interactions varies across different types of regions.

The three PhD projects examined the geography of university-industry interaction from complementary perspectives. Kwadwo Atta-Owusu started from the perspective of academics, analysing how individual motivations, organisational support, and regional context affect their engagement with external stakeholders. He found that engagement is driven more by career than financial motives. Place attachment is also an important motivating factor for interaction with regional actors.

The other two projects studied interaction from the perspective of firms. David Fernández Guerrero examined why firms interact with universities. He found that graduate employees tend to drive interaction with their alma mater universities, especially in rural regions. Firms' knowledge acquisition strategies and collaboration with other research and technology organisations are also important determinants of interaction with universities.

Utku Ali Rıza Alpaydın asked a similar question, focusing on how different proximity types influence firms' choices of partners. While universities and firms are sometimes portrayed as belonging to different worlds, firms view proximity to universities in a cognitive, social, or institutional sense as important to their decisions to interact. In turn, interaction helps them develop a closer relationship to universities.

The three projects have shown that university-industry interactions are embedded in the local context. While both firms and universities participate in larger global business and academic networks, their interaction is mainly local. This local interaction results from the need for social connections and other types of proximity to their partners. When interacting across sectors, both firms and academics mainly have such connections in the local community. Both actors are partly also motivated by a desire to contribute to the communities to which they belong.

PhD Fellows in Places and Territories

KWADWO ATTA-OWUSU

Thesis theme
Promoting academic engagement in regions: how individual contextual factors shape engagement activities

Host Institution
University of Stavanger

Supervisor
Rune Dahl Fitjar, University of Stavanger

Co-supervisor
Paul Benneworth, University of Twente & Western Norway University of Applied Sciences

External Mentor
Inge Bakker, Regio Twente

UTKU ALI RIZA ALPAYDIN

Thesis theme
University-industry collaborations: a matter of proximity dimensions?

Host Institution
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Supervisor
Rune Dahl Fitjar, University of Stavanger

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External Mentor
May Endresen, Greater Stavanger

DAVID FERNÁNDEZ GUERRERO

Thesis theme
Industry-university collaboration in different types of regions: the role played by non-metropolitan university actions, graduate employment, and external knowledge sourcing in industry-university collaboration

Host Institution
Linköping University

Supervisor
Ina Drejer, Aalborg University

Co-supervisor
Artur da Rosa Pires, University of Aveiro

External Mentor
Charlotte Damborg, North Denmark Region

Places and Territories

Main Findings and Recommendations

The findings have implications for firms and universities, as well as for policy to support university-industry interaction.

For firms that want to interact with universities, it is essential to bridge cognitive, social, and institutional distances to the university. Hiring university graduates can be an effective way to achieve this, as graduates often have social connections and an understanding of the university's way of thinking. Starting with more informal collaborations can also help the firm build closer relationships to the university. Moreover, working through intermediaries such as research and technology organisations enhances interaction.

For universities, the results highlight that academics are motivated mainly by the desire to promote their research careers, including when they interact with external stakeholders. Financial incentives or internal organisational recognition contribute less to their motivation than research career development. This finding implies that universities need to align their engagement activities with their academics' research ambitions to promote engagement. International academics need support with their development of local informal networks to realise their potential to work as bridges between regional and international academic networks.

Policymakers should recognise that university-industry interaction is a multi-faceted phenomenon, including collaboration in research, innovation, education, and various other activities. Instruments to support various activities are needed because interaction often starts with small-scale, more informal initiatives. These interactions help build trust and mutual understanding between firms and academics, which is necessary for demanding research and innovation projects.

Kwadwo Atta-Owusu is practicing for the PhD defense with Paul Benneworth and David Fernández Guerrero during the Stavanger Training Week.

David Fernández Guerrero, Utku Ali Rıza Alpaydın and Kwadwo Atta-Owusu presenting initial ideas for their theme in Aalborg in June 2017.

Kwadwo Atta-Owusu

Promoting academic engagement in regions: how individual and contextual factors shape engagement activities

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SUMMARY OF THE PROJECT

The need to harness knowledge to improve the innovativeness and development of regions has brought the regional role of universities to the forefront of academic and policy discourses. Although universities, as institutions, are expected to lead regional engagement, academics remain the agents who engage with external actors in practice. Academics need to perform other work roles in addition to engaging with regional actors. These competing demands pose a challenge to the effective fulfilment of regional engagement. Amidst these tensions, there is a need to understand whether and how academics engage with regional actors, and the factors influencing such engagement. Whereas academics remain the key agents, they do not engage in isolation, but do so together with external actors. Thus, examining the factors that determine engagement from the academics' perspective alone cannot fully explain the nature of regional engagement. This incomplete perspective has made it imperative to investigate this engagement from both actors' sides to better understand the mechanisms driving it. Accordingly, this project's overall goal was to provide new insights into the role of individual and contextual factors in regional engagement.

> ❝
> **The need to harness knowledge to improve the innovativeness and development of regions has brought the regional role of universities to the forefront of academic and policy discourses.**

OVERVIEW OF RESULTS

The findings generally demonstrate that both individual and firm-related factors remain important drivers of regional engagement, while university-related factors matter less. Specifically, individual motivation generally exerts a significant effect on the engagement activities of academics. However, career, prosocial, and pecuniary motivations become more salient at specific career stages. Career motivation is most important at the early and late-career stage, while pecuniary motivation matters most at the late-career stage. Prosocial motivation remains most important at the mid-career stage. The findings also underscore the relevance of academics' local rootedness and social embeddedness to regional engagement. Academics' attachment to place increases their propensity to engage with regional actors, albeit more strongly so for native than non-native academics. Formal networks of academics engender knowledge transfer to peripheral regions. Also, informal social networks are associated with increased regional engagement. Relatedly, informal social networks tend to benefit native academics' engagement while they have no impact on non-natives. Furthermore, the findings show that regional firms' knowledge strategies increase their likelihood to collaborate with university partners. Lastly, the perception of organisational fairness has a limited or no effect on academics' external engagement.

POLICY RECOMMENDATIONS

• University managers need to pay attention to career policies that reward academics who engage with external actors. Since academics are motivated mostly by career goals, rewards should target promoting the advancement

Kwadwo giving his input to a discussion during a visit to the Regio Twente offices in Enschede in June 2018.

of academic careers. Rewarding engaged academics with more research time and extra funding represents a promising motivational policy.

• Academics' regional embeddedness represents a fruitful means by which their research can impact local communities. University managers can support academics to develop their social relations by organising socio-cultural events and encouraging them to join voluntary or industry associations.

• Policymakers need to think about strategies that stimulate academics' identification with and embeddedness in localities. Policy interventions that promote inclusiveness and diversity and help academics develop social relations effectively promote the regional engagement of academics.

• Policymakers interested in improving the innovativeness of peripheral or lagging regions might consider leveraging academics' formal networks as channels of external knowledge to these places.

• Given that firm-related conditions strongly influence their decision to collaborate with universities, policies to promote university-industry collaboration should mostly target firms. Policymakers should channel their efforts on firms and incentivise them to develop collaborative ties with universities.

CURRENT ACTIVITIES

Kwadwo is a Research Fellow at the Centre for Innovation Research at the University of Stavanger Business School in Norway.

KEY PUBLICATIONS

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, 265–280.

Atta-Owusu, K., & Fitjar, R.D. (submitted). What motivates academics for external engagement? Exploring the effects of motivational drivers and organizational fairness.

Atta-Owusu, K., & Fitjar, R.D. (submitted). Engaging for love of place? The role of place attachment in academics' regional engagement efforts.

David Fernández Guerrero

Industry-university collaboration in different types of regions: the role played by non-metropolitan university actions, graduate employment, and external knowledge sourcing in industry-university collaboration

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SUMMARY OF THE PROJECT

In the 1980s, policymakers started promoting universities' involvement in regional economic development. Since then, universities have increasingly been incentivised to develop a range of third-mission activities to transfer their knowledge to local firms, adapting their educational and research activities to support local industry innovation. Simultaneously, increasing regional disparities in innovative activity and economic development suggest that policies promoting collaboration between universities and regional firms should be suited to different types of regions; factors relevant to industry-university collaboration in one region might not be as relevant in other regions.

This project addressed the following research question: "To what extent do the roles of key factors associated with industry-university collaboration differ across varying types of regions?".

Four papers delved into this question using a mixed-methods approach. The first and final papers were case studies investigating the start and development of industry-university collaborations in non-metropolitan regions of Denmark, Norway, and Portugal. The second and third papers were based on quantitative methods to test for differences among regional types in Denmark, examining the statistical association between factors related to industry-university collaborations' occurrence and nature.

OVERVIEW OF RESULTS

The project results identify a range of factors whose roles in industry-university collaboration vary across different types of regions. The positive association between firms' employment of university graduates and industry-university collaboration is stronger among firms in rural regions than among firms located elsewhere; the knowledge from university research provided by graduate employees allows firms in rural or peripheral regions to collaborate with universities, despite being located further away from any university than firms in more densely populated regions. Firms in non-metropolitan regions that collaborate with research and technology organisations (RTOs) are less likely to collaborate with universities, compared to firms located elsewhere. However, the desire among firms in non-metropolitan regions to satisfy international customers incentivises them to develop their collaborative links with universities. Non-metropolitan universities are also key actors in establishing industry-university links by supporting the development of new industries and approaching new small and medium-sized enterprise (SME) partners in their home regions.
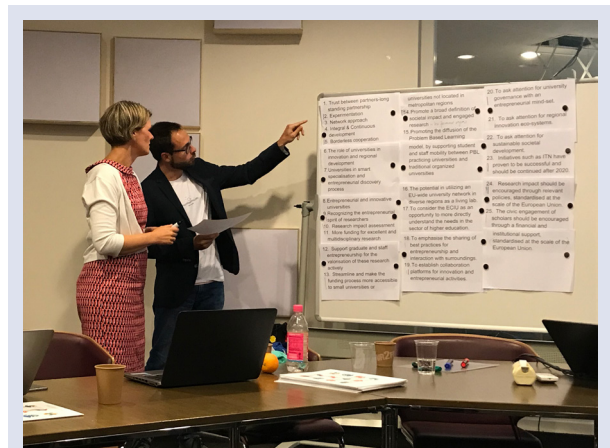

Aalborg, Denmark.

Presentation of group work results for the Secretary General of ECIU, Katrin Dircksen.

David compiling and structuring the input received at a Think Tank event in 2018.

POLICY RECOMMENDATIONS

The findings of this project give direction to a range of policy recommendations. Regarding universities, policies that provide financial support to non-metropolitan universities' regional engagement activities can further incentivise their devotion to educational, research, and third-mission activities for regional development. Regarding firms, policies should be designed with an eye for their incentives and goals in different regions when starting and developing collaborations with universities, such as attracting international customers. The findings of this project help point to existing schemes that could be redirected to increasing rural firms' incentives to collaborate with universities. These policies would include increased financial incentives to rural firms that wish to hire university graduates or purchase research services from universities and RTOs.

CURRENT ACTIVITIES

David works at the Centre for Agro-food Economics and Development in Castelldefels, Spain.

KEY PUBLICATIONS

Guerrero, D.F. (2020). Industry–university collaboration in rural and metropolitan regions: What is the role of graduate employment and external non-university knowledge? Journal of Rural Studies, 78, 516–630.

Guerrero, D.F. (2020). SME-university collaboration in non-metropolitan regions: A multiple case study analysis of how collaborations start and unfold. RUNIN Working Paper Series 04/2020. DOI: 10.3990/4.2535-5686.2020.04.

Guerrero, D.F. (2020). Bridging the gap between firms and universities: Firm links with research and technology organisations in different types of regions. RUNIN Working Paper Series 03/2020. DOI: 10.3990/4.2535-5686.2020.03.

Utku Ali Rıza Alpaydın
University-industry collaborations (UICs): a matter of proximity dimensions?

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Utku presenting his work during the RUNIN
Training Week in Barcelona in November 2017.

SUMMARY OF THE PROJECT

Firms and universities interact with each other despite several barriers hindering their collaboration, such as differences between worldviews, organisational structures, and cognitive capabilities. This interaction suggests that these gaps can be bridged. The proximity between the actors may help in the formation of university-industry collaborations (UICs). Proximity plays a bridging role between academia and industry and has multiple dimensions, including geographical and various non-geographical dimensions, such as cognitive, organisational, institutional and social dimensions. University-industry collaboration also represents an umbrella term covering many different types of collaboration with a broad range of activities driven by various motivations.

Hence, this project examined UICs from the proximity perspective and aimed to increase the understanding of proximity in UICs. It analysed the role, importance, and influence of proximities regarding UICs, which differ greatly in terms of their contents, outputs, and motivations. The results indicate that proximity aids the formation of UICs. However, the influence and importance of different forms of proximity depend heavily on the UIC channels in question and the initial motivation of the firm to interact with universities. Additionally, the collaboration process might lead to increased proximity between actors.

OVERVIEW OF RESULTS

First, the findings demonstrate that the propensity to collaborate with regional versus non-regional universities varies based on the location of actors. While the varying influence of geographical proximity may cause this, it may well also be due to other factors. To better explain the influence of proximity dimensions in UICs, non-geographical proximity dimensions should be included.

Second, the importance of proximity dimensions differs between UIC channels. In this regard, the findings indicate that cognitive and institutional proximity have the highest importance for knowledge exploration collaborations, while geographical proximity matters less. For knowledge exploitation collaborations, social proximity is the most important dimension. Organisational proximity matters less for advice-seeking collaborations compared to other UICs.

Third, the results indicate a close relationship between the formalisation of interactions and tangible outputs, such as patents, and the contribution of interaction processes in the development of non-geographical proximity, regardless of the UIC type.

Finally, UICs motivated by the need for capacity development and relying on cognitive proximity are less sensitive to distance, while geographical proximity matters more for firms intending to create societal impact and which build their collaboration on institutional and social proximity.

Regional stakeholders listening when Utku is presenting his research objectives during an event organised by the Center for Regional Development in Aalborg in 2017.

POLICY RECOMMENDATIONS

• Policy-makers need to develop mechanisms to cover the full range of interactions between universities and businesses, rather than emphasise commercialisation and technology transfer activities.

• Since firms generally connect to universities in their home region, universities should be aware of their regional role and attempt to deepen their expertise to better align with the priorities of regional industries.

• Businesses need to consider not only geographical proximity but also their similarity to universities in cognitive, institutional, organisational and social terms before establishing university collaborations.

• Policies need to be designed and implemented to foster generic linkages or simple networking between academic and industrial actors, which small-scale projects can enhance.

• Financial support organisations or intermediary organisations that promote UICs, such as research councils, need to differentiate their support mechanisms by conducting a priori 'needs assessments' of firms and devise more targeted interventions.

• Since UICs are hindered fundamentally by the institutional distance between universities and industry, some flexibility in the regulations and norms governing universities and firms needs to be introduced.

•   The motivational differences between firms in establishing UICs should be acknowledged in designing policy mechanisms, and firms' endeavours to forge UICs need to be supported in line with their motives.

CURRENT ACTIVITIES
Utku currently works at the Silkroad Development Agency in Gaziantep, Turkey as Head of the Programme Management Unit.

KEY PUBLICATIONS
Alpaydın, U.A.R., & Fitjar, R.D. (2020). Proximity across the distant worlds of university-industry collaborations. Papers in Regional Science. DOI: 10.1111/pirs.12586.

Alpaydın, U.A.R. (2019). Exploring the spatial reach of co-publication partnerships of multinational enterprises: To what extent does geographical proximity matter? Regional Studies, Regional Science, 6, 281–298.

Fitjar, R.D., & Alpaydın, U.A.R. (2019). Næringslivets samhandling med universiteter og høgskoler i og utenfor regionen: Funn fra en undersøkelse av norske bedrifter. In J.P. Knudsen, & T. Lauvdal (Eds.). Geografi, kunnskap, vitenskap: Den regionale UH-sektorens framvekst og betydning (pp. 177–194). Oslo: Cappelen Damm Akademisk.

Practices and Governance

The research carried out under the Practices and Governance theme explored how universities' regional engagement influences the practices and governance of innovation and regional development. Such changes and impacts occur at universities and different regional stakeholders they interact with, such as government bodies, societal actors, and firms. As such, the university is an important stakeholder in developing regional innovation systems and often a significant source of knowledge and learning in and beyond their region. The four PhD projects in this theme addressed and examined the contributions of and implications for universities from different perspectives regarding innovation and regional development practices and governance.

PhD fellows Sofya Kopelyan and Rıdvan Çınar analysed university governance, exploring their third-mission orientation and its implications for strategy, overall mission, and institutional challenges. Sofya studied the 'mission stretch' between academic excellence and regional engagement in three innovative universities within the RUNIN network by exploring the nature and implications of their strategic prioritising towards their regional missions. Rıdvan studied two entrepreneurial universities in peripheral regions transitioning to an engaged university model. Such

transition was analysed in terms of the conceptualisation of innovation, the contributions to regional development, and the institutional challenges they represent.

The other two PhD projects by Sergio Manrique and Huong T. Nguyen focused on the interactions of universities with other regional stakeholders, especially firms and citizens, and explored the functioning and impacts of such partnerships. Sergio's work aimed to assess the impact of university-industry collaboration (UIC) on innovation-related firm performance using business economics tools, exploring how such impact translates into regional development. Finally, Huong T. Nguyen studied the Quadruple Helix of innovation, focusing on the role of citizens and civil society organisations in the knowledge creation and innovation process. She extended the Triple Helix, which only considers governments, universities, and industry.

The four PhD fellows have used different methodological approaches and conceptual bodies in their studies. However, all case studies were predominantly based on in-depth and semi-structured interviews as a critical source for analysing regional innovation practices and governance, focusing on universities as key players.

PhD Fellows in Practices and Governance

SERGIO MANRIQUE

Thesis Theme
Assessing the impact of university-firm collaboration on firm performance and regional development

Host Institution
Autonomous University of Barcelona

Supervisor
Emili Grifell-Tatjé, Autonomous University of Barcelona

Co-supervisor
Ragnar Tveterås, University of Stavanger

External Mentor
Javier Valero, Parc de Recerca UAB

SOFYA KOPELYAN

Thesis Theme
University governance in the times of 'mission stretch': implications for the regional mission

Host Institution
University of Twente

Supervisor
B.J.R. van der Meulen, University of Twente

Co-supervisor
Paul Benneworth, University of Twente & Western Norway University of Applied Sciences

External Mentor
Maria Swartz, Linköping University

RIDVAN ÇINAR

Thesis Theme
Transitioning from entrepreneurial to engaged university model: evolving conceptualization of innovation, contributions to regional development and challenges of institutional change

Host Institution
University of Aveiro

Supervisor
Paul Benneworth, University of Twente & Western Norway University of Applied Sciences

Co-supervisor
Dzamila Bienkowska, Linköping University

HUONG T. NGUYEN

Thesis Theme
From the Triple to the Quadruple Helix: the role of citizens in innovation

Host Institution
Autonomous University of Barcelona

Supervisor
Pilar Marquès, University of Girona

Co-supervisor
Ina Drejer, Aalborg University

Practices and Governance

Main Findings and Recommendations

The research findings have implications for university and industry actors, and policymakers performing interventions related to innovation and universities' regional engagement.

Challenges exist in the strategic and institutional adoption of regional engagement goals at universities. The dissociation between strategic and operational levels complicates implementing a shared agenda by university academics and policymakers. Universities stretch their strategies to accomplish academic excellence, with less consideration of their regional engagement goals. Policymakers can mitigate 'regional mission' deflection by aligning governance, instrumental, and institutional modes through network governance, diversification of professionals involved, and alignment of regional partners through network and community building. Challenges in the transition to an engaged university model include tensions among the evolving concepts of innovation, various legitimacy levels for different regional contributions, and differences in academic identity of some disciplines more used to an entrepreneurial university model. Policymakers should value all types of innovation, align universities' expectations to avoid conflicting demands, and develop multi-level incentive schemes for supporting universities in peripheral regions. Universities should recognise different socialisation processes towards the entrepreneurial model for different disciplines, diversify academic staff identities to accommodate contributions to all innovation types, and create an organisational environment in which all regional contributions can be desired and valued.

Challenges also exist for citizens and firms in the collaboration for innovation. Adopting a Quadruple Helix approach affects the practices and governance of innovation at different levels, all interrelated when introducing citizens' participation in innovation. Quadruple Helix actors should focus more closely on the mechanisms through which civic actors can exercise their agency. To do so, universities and local governments should be employing short-term multisector facilitators while improving long-term organisational capabilities to enable beneficial collaboration practices. Managing stakeholders' satisfaction in multi-actor networks should include communication of stakeholders' expectations, agreements on responsibilities and goals, and coordination and monitoring of interactions. For firms, personal networks and trust in the evolution and success of UICs are relevant. The positive economic impact of UICs on industry innovation and performance was demonstrated by improvements in technical efficiency and technology, with great potential for transfer into regional industrial development. Hence, regional innovation policies should more closely consider informal factors in UICs and realise the great potential for win-win relationships between firms and universities, justified in economic terms. Academia cannot fail to empower managers and practitioners working towards this.

Huong Nguyen, Sergio Manrique and Rıdvan Çınar presenting group work during the Linköping Training Week in September 2019.

Poster session for different actors and RUNIN stakeholders in the Stavanger Region.
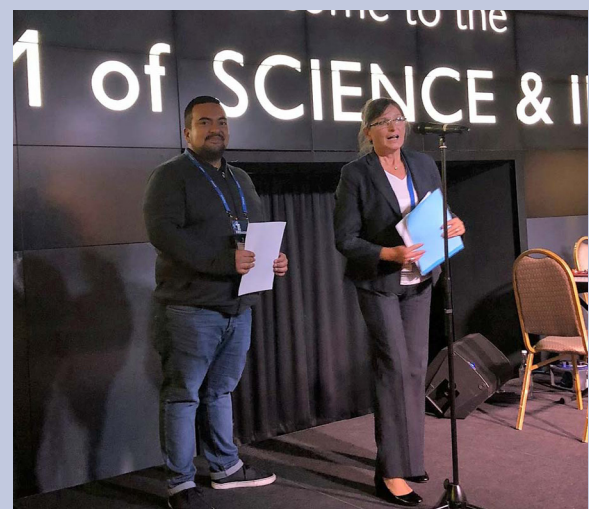
Sergio Manrique receiving the Triple Helix Association Early Career Researcher Best Paper Award in 2018.

Sergio Andrés Manrique Garzón
## Assessing the impact of university-firm collaboration on firm performance and regional development

SUMMARY OF THE PROJECT

This project assessed the impact of collaboration with universities on firms and regions, focusing on how such interactions create economic value. The project examined how university-industry collaboration (UIC) can aid the survival of firms in a global and competitive market, therefore translating into regional development. The working hypothesis was that collaboration with universities should facilitate the development of new or improved industrial products and practices, leading to better innovation-related financial performance. To this end, this project studied why and how firms collaborate with universities and how such interaction positively impacts firms' innovation-related financial performance, potentially translating into regional and industrial development via the firms' innovation-related productivity. The project comprised case studies to explore the development and functioning of collaboration between universities and firms in Spain. A literature review and conceptual framework of motivations, types, and (economic) impacts of UICs was also developed. Finally, an empirical study analysed the impact of collaboration with universities on firms' financial performance. Contextual aspects of the research impact itself and its assessment were also studied.

OVERVIEW OF RESULTS

Data from a survey of Spanish firms (Panel de Innovación Tecnológica, PITEC) shows an innovation-related profitability gain in collaborating firms over non-collaborating firms, mainly explained by positive productivity changes by technical efficiency improvements (see Figure below). Firms in the collaborating group seem to be larger, with higher innovation revenues and costs.
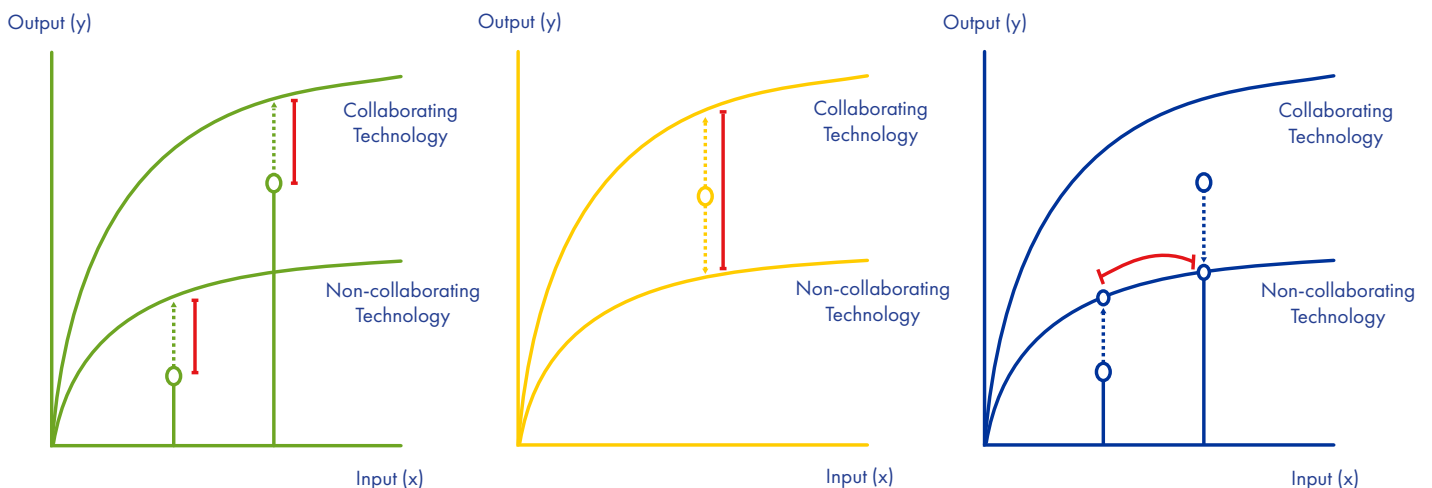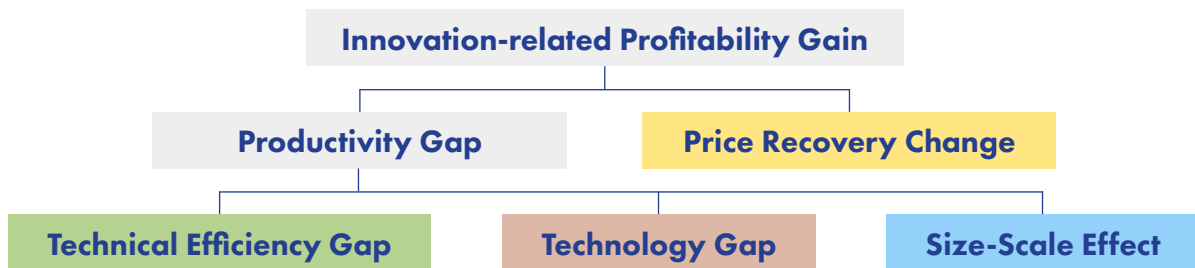
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The study of the Autonomous University of Barcelona (UAB)-Henkel partnership concludes that personal relationships, trust and institutional factors determine this R&D partnership's success. This collaboration serves as a representative case and pathfinder for public-private R&D partnerships and university-firm interactions. It has had positive impacts on both the university (pathway from basic research to innovation, industry training) and the firm (product development, patents, talent detection, prestige). Moreover, it has positive effects on the region (employment, economic growth) (see Figure on page 48).

The UAB case study shows that universities with an international vision can also generate significant regional impacts. The UAB has a strong impact due to its intensive knowledge spillovers, technology transfer, and several projects developed to solve regional public concerns. However, in general, firms in Catalonia do not have the culture or the ideas to collaborate with universities.

POLICY RECOMMENDATIONS

This project presents scientific evidence of the potential positive impacts of university-firm collaborations on firms' innovation-related financial performance and regional development. Industrial policy should consider the potential gain from UICs in firms' financial performance via technical efficiency and technology, which could positively affect sectoral and regional industrial productivity. Consequently, regional innovation policies which currently assign a key role to universities could complement this approach with a broader focus on the potential economic benefits of UICs on industry and pay more attention to the role of personal networks and trust in such interactions.

There is a great unexplored potential for win-win relationships between firms and universities, in which engagement in UICs can be justified in economic terms from the firms' perspective. Academia should not fail to communicate and sensitise business managers and practitioners to the potential economic benefits via innovation from collaboration with universities.

The multidimensional approach for research impact assessment (MARIA) model has contributed to the current debate on research evaluation and impact assessment and aims to shape novel and comprehensive ways for research policymakers and funding agencies to approach these issues of.

CURRENT ACTIVITIES

Sergio is based in Colombia and currently works as Project Manager in the IT consultancy sector, while finalizing his PhD studies at UAB.

KEY PUBLICATIONS

Manrique, S., & Grifell-Tatjé, E. (2020). Assessing the impact of university-firm collaboration on innovation-related financial performance. RUNIN Working Paper Series, 02/2020. DOI: 10.3990/4.2535-5686.2020.02.

Manrique, S. (2018). Personal networks and trust in public-private R&D partnerships: A case study from Spain. RUNIN Working Paper Series, 12/2018. DOI: 10.3990/4.2535-5686.2018.12 [2018 Triple Helix Association Early Career Researcher Best Paper Award]

Manrique, S., & Nguyen, H.T. (2017). Balancing regional engagement and internationalisation: The case of Autonomous University of Barcelona. RUNIN Working Paper Series, DOI: 02/2017. 10.3990/4.2535-5686.2017.02.

Sofya Kopelyan

University governance in the times of 'mission stretch': implications for the regional mission

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SUMMARY OF THE PROJECT

This project explored the implications of universities' strategic priority setting for their regional missions. It examined the 'stretch' between the quest for academic excellence and regional engagement in three innovative universities (Aalborg University, Linköping University, and the University of Twente) through analytic case studies. The main question was how strategic university governance facilitates the implementation of the regional mission in case of 'mission stretch'. The project studied (i) institutional aspects characterising the complexity of university-regional engagement; (ii) how academics in regionally engaged universities process the 'identity stretch' between the core academic mission and the regional mission; (iii) how these universities narratively coordinate diverse organisational actors towards delivering a 'regional mission' that is well-connected to and supportive of their other missions; and (iv) how they build their structural capacity to facilitate boundary-crossing activities and university-regional knowledge exchange.

OVERVIEW OF RESULTS

Analysis of strategic documents and 85 interviews in three RUNIN-universities has revealed (i) four complexities that limit university-regional engagement: strategic governance, intermediary structures, institutional entrepreneurs, and knowledge exchange; (ii) three distinct identity types amongst regionally engaged academics: academics who combine scientific rigour with local relevance without significantly altering their core identities; academics who pursue 'excellence with impact', prioritising collaborative practices over career progression; and academics who prefer the 'real world' over campus life and exhibit a greater variety of identity choices; (iii) two strong narratives: the narrative of a global-local knowledge pipeline and the narrative of the entrepreneurial university, which both can construct the relationship between the regional mission and other strategic missions of the university; (iv) how strategic coordination of regional engagement in case of 'mission stretch' can downplay its institutional importance for operational actors; and (v) how innovative organisational structures add little value to the implementation of the regional mission when operational actors do not form a community of practice, and their actions do not develop into a shared practice.

POLICY RECOMMENDATIONS

The fact that universities' strategic and operational levels are often decoupled from each other constrains both university academics and policymakers to create a shared agenda and put it to practice. On top of that, universities in many regions 'stretch' their strategies to achieve world-class success and, as a consequence, reduce the institutional importance of the regional mission. This research suggests that to mitigate the marginalisation of the regional mission, university policymakers could:
 • Align managerial modes of governance with network governance;
 • Align instrumental and institutional (cultural) modes of governance, for instance, by optimising the mix of professionals with different engagement identities in universities' departments and project teams and by giving scope for action-to-action researchers, matchmakers, and the like;
 • Frame strategic narratives in a way that drives university-regional engagement at the faculty level; and
 • Make provision for network and community building to align partners around regional projects.

Saeed and Sofya summarizing input from Think Tank participants at DesignLab Twente.

Sofya and Lisa were hosts for the RUNIN fellows Rıdvan and Kwadwo who were on a three months research stay in Twente

CURRENT ACTIVITIES
Sofia works as a Project Manager in Strategic Business Development at the University of Twente, The Netherlands.

KEY PUBLICATIONS
Kopelyan, S. (submitted). Between academic excellence and local relevance: An 'identity stretch' of boundary-crossing academics.

Kopelyan, S. (submitted). 'It's not in the mission, it's in the strategy': Narrative analysis of the regional mission of an entrepreneurial university.

Kopelyan, S., & Nieth, L. (to be submitted in 2021). Bringing a match made in heaven down to earth: The case of regional innovation matchmakers in North Denmark.

Sofya presenting her work in Barcelona in November 2017.

Rıdvan Çınar

Transitioning from an entrepreneurial to an engaged university model: Evolving conceptualisation of innovation, contributions to regional development, and challenges of institutional change

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SUMMARY OF THE PROJECT

This project explored the extent to which two entrepreneurial universities (University of Aveiro and University of Twente) located in less-developed regions, can transition into an engaged university model. Transitioning from an entrepreneurial to an engaged university was conceptualised as an institutional change from a model in which a techno-economic understanding of innovation is the determining force in the type of third-mission activities, with industry as the leading collaborating partner, to a model in which universities have a broader understanding of innovation (social, environmental, cultural, and artistic), and also collaborate with other segments of society (municipalities, NGOs, citizens). By mobilising five key concepts in institutional theory – critical juncture, institutional complexity, institutional logics, legitimacy, and level of structuration – the project examined the institutional change process within the context of the evolving conceptualisation of innovation. It also delved deeper into the challenges of such an institutional change process at the micro, meso and macro levels. The project identified the key factors exerting influence over the change process: the interplay among societal level structures, the interaction of underlying causal mechanisms emanating from these structures, the events stemming from these mechanisms, and the experiences of individuals in universities.

OVERVIEW OF RESULTS

This project analyses 73 semi-structured interviews in both regions as well as several relevant documents, such as the regional smart specialisation strategies and the strategic plans of both universities. The findings demonstrate that while both institutions have made significant progress in the last 15 years and are much closer than before to being classified as such, they still have not fully transitioned into engaged universities for three main reasons. Firstly, our understanding of innovation in Europe has changed significantly, resulting in the broadening of the concept. This broadening involves tensions between different conceptualisations of innovation, which have also permeated universities. Secondly, not every type of regional contribution has the same degree of cognitive-cultural legitimacy within universities. Increasing recognition of social innovations, bio-based innovations, or culture and creativity-driven regional development might exist. However, the leading regional engagement activities are still technological innovation, research commercialisation, and supporting start-ups. Similarly, although there is a diversification of societal actors that both universities collaborate with, the leading collaborating partner remains the industry. Lastly, an engaged university model requires a different academic identity for disciplines that have developed their identities based on an entrepreneurial university model.
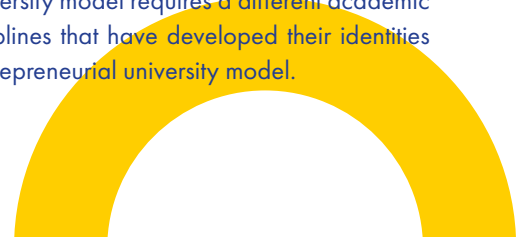
Rıdvan receiving feedback from a participant at a poster event in Brussels.

Presentation of some of the takeaways from the Think Tank event in Enschede on activities needed in order to improve the way that the university contributes to meeting societal needs.

POLICY RECOMMENDATIONS

For policymakers:

• Acknowledge a broad understanding of innovation and value all types of innovation, not just technological innovation for economic growth, but all types of innovation to address significant societal challenges.

• Align expectations from universities and avoid articulating demands that are fundamentally conflicting with each other.

• Develop incentive schemes to specifically support universities located in less-developed regions at regional, national and European levels.

For universities:

• Recognise the varying socialisation processes that different disciplines have developed over time within the entrepreneurial university context whilst framing regional engagement.

• Diversify academic staff with different academic identities to accommodate contributions to all types of innovation.

• Create an organisational environment in which all types of regional contributions are seen as desirable and valuable.

CURRENT ACTIVITIES

Rıdvan works as a Researcher at the Western Norway University of Applied Sciences.

KEY PUBLICATIONS

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

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

Çınar, R., & Benneworth, P. (Submitted). Evolving conceptualization of innovation in the European Union and its impact on universities: Critical junctures and changing institutional demands.

Huong T. Nguyen
From the Triple to the Quadruple Helix: the role of citizens in innovation

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SUMMARY OF THE PROJECT

This project aimed to provide a systematic understanding of the Quadruple Helix notion, as an extension of the Triple Helix, and its practical implications. While the Triple Helix promotes the relationships among governments, universities, and industry, the Quadruple Helix model suggests the additional participation of the fourth helix, representing the societal demands in the knowledge creation and innovation processes, such as from citizens and civil society organisations. The overarching research question was how the Quadruple Helix functions in innovation practice and whether (and how) it was able to accomplish its promises. Accordingly, explorative studies were performed using cases from Spain and Denmark that sought to engage citizens and other actors into their activities. These cases include Living Labs as orchestrators of the Quadruple Helix, local governments, and a university, with primary data drawing from interviews with all Quadruple Helix actors. The results show that the 'ideal' governance arrangements with the presence of the Quadruple Helix model could hardly be found. This absence of 'ideal' arrangements has led to the conclusion that incorporating citizens to improve the quality of governance and decision-making is more challenging than simplistic Quadruple Helix discourses propose. One of significant requirements is to consider the interests of citizens and relevant organisations.

OVERVIEW OF RESULTS

Adopting a Quadruple Helix approach influences different levels of innovation practices and governance, including the macro-level of (regional) innovation systems, the meso-level of specific organisations, and finally, the micro-level of related projects and individuals (see Figure below). These three levels are interrelated, so changes in one level would change the whole innovation landscape. For instance, a (macro-)regional innovation system that appreciates citizens' value would potentially change the norms at the (meso-)organisational scale and subsequently lead to

Macro-level — Regional Innovation Systems

Engaging citizens require explisit leadership, such as from local or regional governments, to let citizens raise their voice and establish themselves as legitimate actors in the system

Meso-level — Organisations

Opening up to collaborative innovation requires formal and informal structures/mechanisms that help organisations overcome attention biases and interaction barriers

Micro-level — Projects and Individuals

Managing stakeholder satisfaction requires a balance between expecation and real incentives on a long-term basis with a role for a dedicated coordinator

the organisation's participation in (micro-)collaborative projects and the need to recruit individuals with relevant capabilities. Specifically, the project proposes mechanisms to: (i) leverage power positions of citizens in regional innovation systems; (ii) overcome interaction barriers for organisations to benefit from multi-sector collaboration; and (iii) manage stakeholder satisfaction in a multi-sector collaboration.

POLICY RECOMMENDATIONS

The European research and innovation policy discourse has shifted from the Triple to the Quadruple Helix model. Hence, the results of this project have several implications for policymakers and innovation practitioners.

• Instead of calling for 'collaborative leadership' among Quadruple Helix actors, it is important to focus more closely on the mechanisms by which civic actors could reinforce their power sources and positions to exercise their agency. One of the mechanisms is first to identify citizens with actionable knowledge, enrol them into tangible activities that interest them, provide them with the resources needed for co-creation, and then co-opt them into the governance of regional innovation collaborations.

• Universities and local governments could promote collaboration with societal stakeholders to enhance research and innovation by, in the short term, employing people who understand multiple sectors to facilitate activities, and in the long term, improving organisational capabilities (e.g., human capital, structure) to benefit from the collaboration practices.

• Managing stakeholders' satisfaction in multi-actor networks (e.g., Living Labs) is a continuous process, including first communicating to set stakeholder expectations of benefits and challenges, agreeing on frameworks of responsibilities and goals, and enabling dedicated coordinators to facilitate interactions and monitor the production of the expected results.

"How can university, industry and policymakers best work together?" Huong demonstrated this with paper cups at European Researcher's Night in Brussels in September 2017.

CURRENT ACTIVITIES
Huong is finishing her PhD at the Autonomous University of Barcelona.

KEY PUBLICATIONS
Nguyen, H.T. (in prep.). From the Triple to the Quadruple Helix: The role of citizens in innovation (Unpublished doctoral dissertation). Autonomous University of Barcelona, Spain.

Nguyen, H.T., Benneworth, P., & Marques, P. (revised and resubmitted in 2021). Living Labs: Challenging and changing the smart city organisational field?.

Nguyen, H.T., & Marques, P. (to be submitted in 2021). The promise of living lab to Quadruple Helix stakeholders: Exploring expectations, benefits and challenges.

Policy Implications

The policy implications and recommendations of the RUNIN project are summarised below. The policy recommendations focus on (1) university management; (2) regional, national, and international policymakers; and (3) regional stakeholders.

UNIVERSITY MANAGEMENT

Identify research areas of **regional (economic) relevance** as a focus for regional collaborative initiatives.

Build **transdisciplinary networks and structures** within universities to promote internal collaboration and communication.

Identify **engaged academics across all disciplines** and train them in regional engagement addressing the widest possible set of regional needs to include working with industry, government, and civic society.

Encourage regional **networking** and explorative community engagement by **aligning staff** around regional initiatives by (1) creating the infrastructure for staff to engage in regional roles; (2) organising community events; and (3) encouraging staff to join voluntary or industry associations.

Establish a process to collect, understand and communicate the **needs** of the region, both in terms of business and the community.

Recognise that different academic disciplines and different community partners will need to work through **different engagement mechanisms**, with varied needs for assistance, and a diversity of socialisation processes.

Support academic staff members in developing new project designs to ensure high-quality and long-term university-business collaboration by (1) framing **strategic narratives** towards faculty-level collaboration; (2) promoting **bottom-up leadership**; and (3) enabling stakeholders to fulfil regional leadership roles.

Optimise the mix of professional staff supporting regional engagement to accommodate contributions to all innovation types by (1) promoting collaboration with **societal stakeholders** and (2) employing people with **practical experience** of different sectors of society.

Monitor and **manage stakeholders' satisfaction** by (1) clear communication; (2) establishing mutual frameworks of responsibilities and goals; and (3) installing coordinators to facilitate interactions and monitor progress and results.

Support academics who engage with external actors with additional time to do this work, and reflect these activities in academic career evaluation.

Enhance **industry career prospects of PhD candidates** by (1) providing a comprehensive set of generic and transferable skills; (2) involving industry in the design of collaborative doctoral education; (3) organising doctoral education and industry interaction at the academic department and faculty levels rather than in central graduate schools; and (4) creating career centres that support doctorate holders in their industry transition and brand doctoral education to employers.

REGIONAL, NATIONAL, AND INTERNATIONAL POLICYMAKERS

Create policy frameworks that **link research and innovation to regional development goals** to promote university-region collaboration and optimise resources and networks.

Acknowledge all types of interactions between universities and regional partners and value a broad understanding of innovation rather than emphasising commercialisation and technology transfer. Foster step-by-step enhancement of networking between academic and industrial actors.

Create activities, programmes, and initiatives that allow all regional actors to get to know each other and enhance a mutual understanding of similarities, differences, and interests. Create **opportunity spaces** for regional stakeholders to co-create and test ideas.

Rather than solely focusing on regional networks, build new capabilities through forging stronger **links between global, inter-regional, and local networks** to strengthen regional competitiveness .

Communicate clearly what are government's expectations of universities and seek to better align expectations across government departments and levels to **avoid conflicting demands**. Perceive universities' contributions more broadly in building collaborations related to regional priority sectors.

Design initiatives that stimulate academics' **regional identification and embeddedness** while promoting inclusiveness and diversity such as through Responsible Research and Innovation. Help academics develop social relations and behaviours to promote long-term regional engagement.

Provide **financial support** to regional engagement activities in **non–metropolitan regions**. Enhance formal networks of academics as channels for external knowledge to peripheral or lagging regions.

Create more **diverse national and regional adaptations of international funding** programmes such as the European Structural Funds. Initiate joint calls with national science foundations to help integrate applied and fundamental research projects.

Incentivise business to collaborate with universities. Increase financial **incentives to firms** in rural regions who wish to hire university graduates and purchase research and consultancy from universities. Acknowledge firms' **different motivations** for establishing links to universities, and ensure that support is aligned with these motivations through flexible and targeted interventions identified by 'needs assessments' of regional partners.

Consider the potential gain from university-industry collaboration in firms' financial performance via technical efficiency and technology, linked to sectorial and regional industrial productivity. Adopt a broader focus on the potential **economic benefits** of university-industry collaboration and pay more attention to the role of personal networks and mutual trust.

Introduce mechanisms to support **citizen engagement** in local policy and practice by (1) identifying citizens with actionable knowledge; (2) supporting their involvement in collaborative networks with universities and other agencies; (3) providing them with the resources needed for co-creation; (4) co-opting them into the governance of regional innovation collaborations; and (5) employing civic stakeholders who understand multiple sectors.

Provide flexible support for collaborations undergoing transitions where they need to refocus in order to better meet regional needs.

REGIONAL STAKEHOLDERS

Develop an **understanding of community needs** and communicate this to university partners, identifying possible research and teaching projects.

Seek to access the **human and social capital of PhD graduates** by (1) attending PhD career fairs; (2) providing temporary work placements; (3) providing industry training and other initiatives to enhance the employability of PhD holders; and (4) implementing policies supporting the recruitment and employment of PhD graduates.

Communication and Dissemination
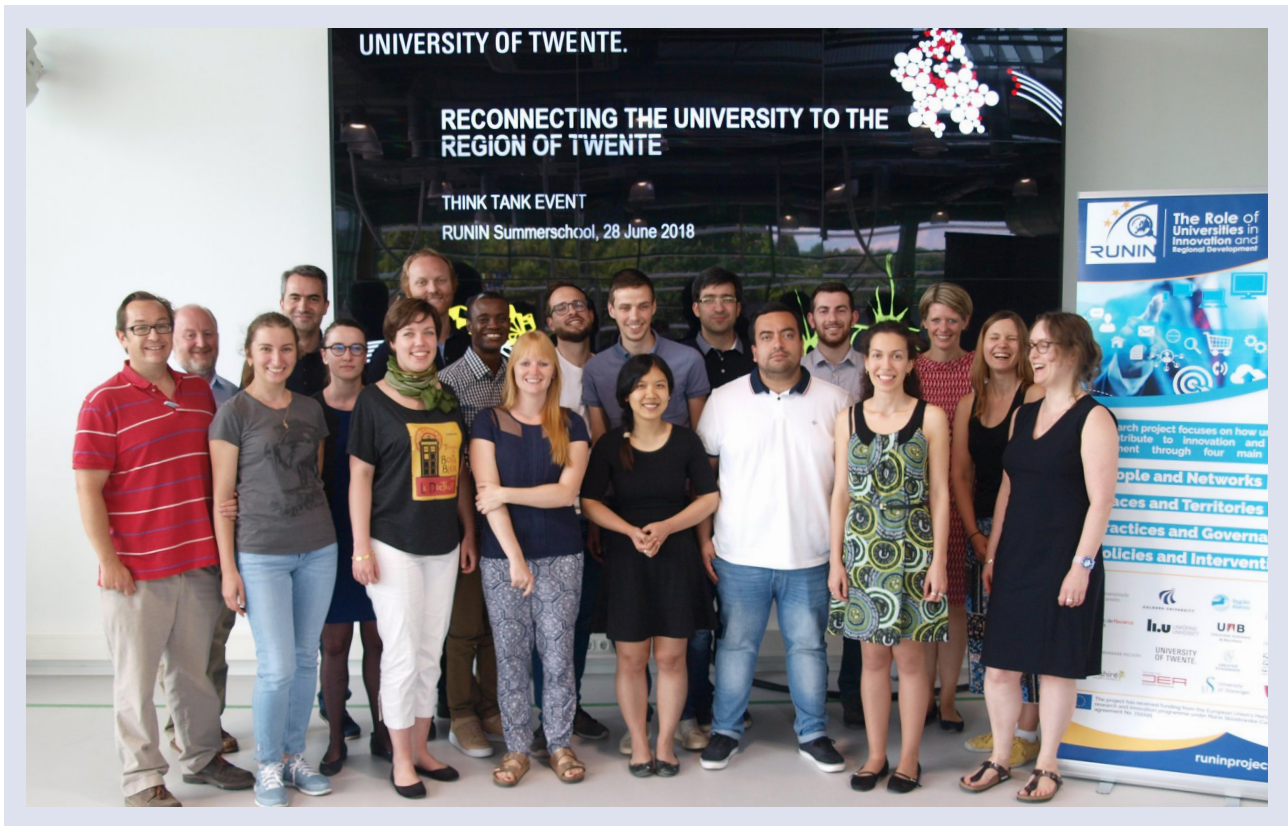
The RUNIN team gathered before kicking off the Think Tank event at DesignLab Twente in June 2018.

RUNIN has adopted a co-creation approach to communications and public engagement. The project has been embedded within a lead 'user' community with non-academic beneficiaries in the participating regions. Training weeks in each of the seven regions have included different types of interactions with stakeholders, such as regional policymakers, university managers, technology transfer professionals, and business representatives. The European Consortium of Innovative Universities has represented a central lead user group. The contact with stakeholders has been used to provide inputs to the research activities, disseminate results, and ensure that the project's findings are interesting and relevant for immediate users.

To support the chosen approach, 'traditional' research dissemination has been supplemented by a dedicated effort to communicate research findings to a broader audience. The project has offered training to do so, including 'Introduction to Twitter for academics', sessions with a science journalist on making videos and podcasts, media training from the local Dutch broadcaster 1Enschede, and internal workshops on making video abstracts for academic

papers. One of the outcomes of these activities is a total of 22 short videos with a combined total of approximately 4,000 views on the RUNIN project's YouTube channel youtube.com/runinproject. The Twitter account @runinproject was launched in March 2017. Less than four years later, there have been more than 1,200 tweets, and the account has close to 800 followers. The RUNIN webpage includes a blog where all PhD Fellows have taken turns to contribute to the academic debate on the role of universities and regional development, and news from the project have been communicated through three newsletter issues circulated to approximately 330 recipients. Popular science communication activities through external media also include articles, interviews and blog posts in outlets such as Blog of the Place-Based Leadership Network, LSE Impact Blog, Blog of the University Industry Innovation Network, ECIU Magazine, Triple Helix Association News, RSA Regions Magazine, Regional insights, Regions e-Zine, and The University-Industry Innovation Magazine. In addition, the PhD Fellows have hosted a Think Tank Event with DesignLab Twente, which has been documented in the report Reconnecting the University to the Region of Twente -
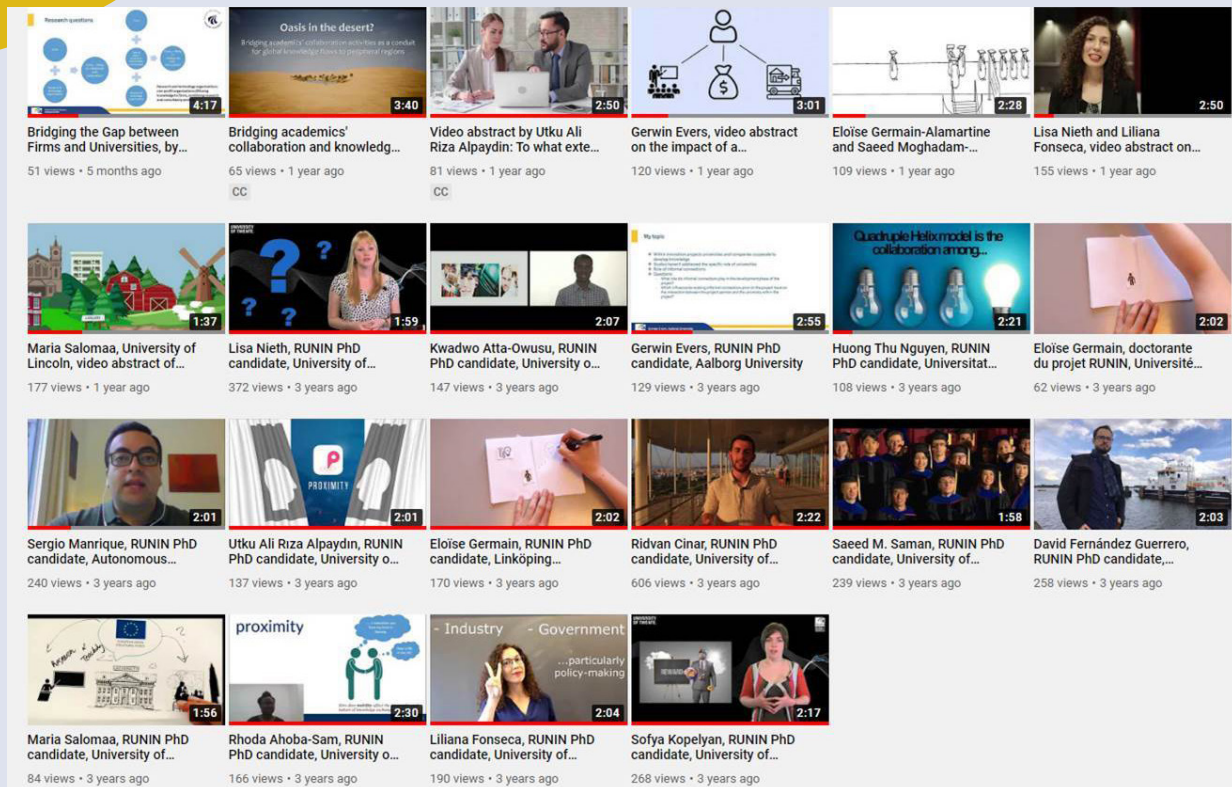
An overview of videos produced by the RUNIN PhD fellows and available from the project's YouTube channel.

Findings from the RUNIN-Design Lab Think Tank, available at runinproject.eu. The PhD Fellows have also presented their findings including policy implications at various poster events, such as the Impact Workshop on How Social Science Research Can Contribute Effectively to Regional Innovation Policies (hosted by the Danish Think Tank DEA), in which academics, policymakers, and university tech transfer or public engagement professionals participated. Finally, the completion of the RUNIN project in February 2021 was marked with a webinar on policy recommendations with 165 participants.

While communication with a general audience is essential for improving the societal impact of research, gaining experience with disseminating research results through academic outlets remains a primary element of research training. RUNIN has developed PhD Fellows' dissemination skills by letting them connect with their appropriate academic communities. All PhD Fellows have presented research findings at international conferences, resulting in more than 60 presentations at training events and conferences such as the European Week of Region and Cities' Master Class, the

Triple Helix Conference, the Regional Innovation Policies Conference, the Geography of Innovation Conference, the Eu-SPRI Forum, and the Regional Studies Association Conference. Research has also been disseminated through the RUNIN Working Paper Series. The 30 working papers are available at runinproject.eu. The PhD Fellows have presented their work at a total of 40+ seminars at their home or secondment universities.

The research of the RUNIN PhD Fellows has also been published in peer-reviewed scientific journals and books. A total of 37 peer-reviewed journal articles and book chapters by RUNIN PhD Fellows have been published or accepted for publication during the project. Moreover, a book on the relationship between each of the seven participating universities and their home regions is underway, and several more papers are in the pipeline for publication. A complete overview of dissemination activities by the RUNIN project is available at runinproject.eu/dissemination.

RUNIN researchers taking questions after presenting their findings for different actors and RUNIN stakeholders in the Stavanger Region.

Parts of the RUNIN team gathered at the Triple Helix Conference in Manchester in September 2018.

RUNIN researchers at the GeoInno conference in Stavanger in January 2020.

Summary of PhD Career Impacts

Throughout their engagement in the RUNIN project, the PhD fellows have been equipped with a set of knowledge and transferable skills relevant to a wide range of societal needs in the context of the knowledge economy. They have trained in key areas relevant to future success outside or within academia, including research methods, use of intellectual abilities, (research) project management, personal effectiveness and organisation, and engagement with others to maximise the impact of their work.

The transfer of skills has become evident when looking at the directions the PhD fellows have taken after RUNIN. Among the fourteen PhD fellows, twelve have already entered into new jobs.

Of these 12,
- Three are working within academia as project managers;
- Three are working within academia as researchers;
- One is working at a start-up company;
- Three are working at policy advising consultancies;
- One is working at a management consulting firm;
- One is working at a regional development agency.

For the PhD fellows who have pursued academic careers, access to an extensive network of established scholars within regional studies and innovation studies has likely been vital in enabling this. Regional and innovation studies are both inherently interdisciplinary fields whose researchers teach and conduct research at the interface between traditional disciplines such as geography, economics, business, sociology, and political science.

The programme also equipped PhD fellows with transferable skills to work in the non-academic sector. It has been of great importance for the RUNIN programme to mobilise a community of users – helping build the kinds of employers where doctoral researchers may continue their working lives in ways that use and continue to build the high-level research, development, and innovation skills developed during the PhD programme. A central element of this process has been working closely with users to help develop organisations in finding ways to use those skills and get the PhD students to understand how they can create occupations where their skills are valuable and valued.

There has been a significant focus within this innovative training network (ITN) on developing general and specific skills through practical workshops and exercises led by experienced academics and practitioners, who also provided inspiration and encouragement. The enhanced skills include entrepreneurial opportunity recognition and exploration, promoting and developing new ideas or potential innovations and engaging stakeholders, cultural openness and adaptation, and building and developing personal and organisational networks.

During their three-year PhD appointment, PhD fellows had to create and update a Career Development Plan on two occasions. The plan was reviewed together with their supervisors and helped reflect upon career aspirations and expectations of the possible impact on their future careers. To maximise the plan's effectiveness and reach their short- and long-term goals, the PhD fellows had to strategically consider their planned PhD courses, secondments, attendance of external courses, workshops, conferences, language courses, and complementary skills training.

In a project evaluation conducted in 2020, 12 out of 14 of the PhD fellows answered that the RUNIN programme has positively to very positively contributed to their professional and career development. The evaluation also disclosed that the programme provided the candidates with tools and perspectives valuable when pursuing a career in academic, public, and business settings. The project has encouraged cross-sectoral career opportunities involving all these contexts simultaneously, as has become evident from current careers of the RUNIN PhD fellows.

Participants of the RUNIN Training Week in Barcelona in November 2017.

José Eduardo de Matos from Comunidade Intermunicipal da Região de Aveiro introducing the region at PCI Creative Science Park in Aveiro in June 2019.

Media training with the local broadcaster 1twente, to understand what local TV audiences are interested in and how to make an abstract scientific message into something that have meaning to that particular audience.

Project leader Rune Dahl Fitjar introducing the project during the first Training Week in Lincoln in March 2017.

The fellows in the Enschede Raadzaal preparing their tentative recommendations for the Twente Board to improve its legitimacy and strategic leadership for the region.

Tour at the family owned farm machinery company Väderstad's facilities outside of Linköping. Guided by one of the owners, Crister Stark.

Visit to the ALBA Synchrotron, located in Cerdanyola del Vallès outside of Barcelona.

The project gathered in Brussels in 2018.

Visit to the non-profit Ampans Foundation in Urpina, Barcelona.

RUNINers gathered at the Geography of Innovation conference in Barcelona in January 2018.

The project gathered in Brussels in 2018

This report is dedicated to the memory of Paul Benneworth who died suddenly in 2020 at the age of 46. Paul was a colleague, supervisor, mentor and a core member of the RUNIN project from the beginning. Everyone who worked with him on the project was touched by his contribution, especially the PhDs who gained hugely from his enthusiasm, commitment and intellect. He was a joy to work with and we all miss him.