



# THE UNIVERSITY *of* EDINBURGH

## Edinburgh Research Explorer

### **Regional contexts for third mission policies and university institutional management**

**Citation for published version:**

Kitagawa, F 2017, 'Regional contexts for third mission policies and university institutional management: Key opportunities and challenges in the UK' *Review Ekonomiaz*, vol 92, no. 2, pp. 14-163.

**Link:**

[Link to publication record in Edinburgh Research Explorer](#)

**Document Version:**

Publisher's PDF, also known as Version of record

**Published In:**

*Review Ekonomiaz*

**General rights**

Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

**Take down policy**

The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact [openaccess@ed.ac.uk](mailto:openaccess@ed.ac.uk) providing details, and we will remove access to the work immediately and investigate your claim.



---

# *Regional contexts for third mission policies and university management in the UK: opportunities and challenges*

Durante las dos últimas décadas, la llamada «tercera misión» de las universidades y su dimensión regional han ocupado un lugar prominente en la agenda de políticas nacionales, mediante una serie de mecanismos de incentivación puestos en marcha a nivel nacional, subnacional e institucional. Este artículo analiza el desarrollo de políticas públicas, estrategias institucionales de las universidades y prácticas de gestión observadas en diversas regiones de Reino Unido. Captamos la evolución de las políticas de la tercera misión que afectan por un lado a los vínculos entre las universidades y las agendas de sus regiones, y por otro al desarrollo de las estrategias institucionales y las prácticas de gestión al nivel universitario. Establecer incentivos para las actividades de la tercera misión incluye procesos complejos a nivel político, institucional e individual. El artículo finaliza identificando tres retos clave para los gerentes y directores universitarios.

*Azken bi hamarkadetan, unibertsitateen «hirugarren xedea» deritzonak eta beraien eskualde dimentsioak leku garrantzitsua hartu dute politika nazionaletan, nazio, nazioz azpiko eta erakunde mailan martxan jarritako pizgarrien mekanismoen bitartez. Artikulu honek, Erresuma Batuko hainbat eskualdetan izan diren politika publikoen, unibertsitateen estrategia instituzionalen eta kudeaketa praktiken garapena aztertzen ditu. Alde batetik, unibertsitateen arteko loturetan eta beraien eskualdeetako agendetan, eta bestetik, estrategia instituzionaletan eta unibertsitate mailako kudeaketa praktketan, eragina duten hirugarren xedeko politiken eboluzioa biltzen ditugu. Hirugarren xedeko jarduerentzako pizgarriak ezartzeak maila politiko, instituzional eta gizabanakoenean prozesu konplexuak dakartza. Artikuluaren amaieran unibertsitateko kudeatzaileentzako eta zuzendarientzako giltzarri diren hiru erronka identifikatzen dira.*

Over the past two decades the so-called «third mission» of universities and its regional dimension has been high in the national policy agenda, with a series of incentive mechanisms put in place at national, sub-national and institutional levels. This paper reviews the development of government policies, universities' institutional strategies and management practices, as observed in the UK regions. We capture the evolving third mission policies that affect the links between universities and their regional agenda on one hand, and the development of institutional strategies and management practices at the university level on the other. Setting incentives for third mission activities encompasses complex processes at the policy, institutional, and individual levels. The paper concludes by identifying three key challenges for university managers and leaders.

## ***Table of contents***

---

1. Introduction
2. Review of literature - Defining the «third mission» and the regional contexts
3. Evolution and diversity of the «regional mission» as observed in the UK higher education sector 1997-2017
4. Organisational diversity and evolution of third mission strategies in the UK
5. Whither UK higher education and its regional mission? – repositioning in the new spatial relationships
6. Concluding remarks

### Bibliographic references

**Palabras clave:** Misión regional, Gestión de la educación superior. Estrategias institucionales, incentivos, Reino Unido.

**Keywords:** Regional mission, higher education management, institutional strategies, incentives, United Kingdom.

**JEL codes:** L38, R11, O31, O38

Fecha de Recepción: 10/07/2017 / Fecha de Aceptación: 16/08/2017

---

## **1. INTRODUCTION**

Besides the traditional missions of scientific enquiry (research) and human capital development (teaching), the so-called «third mission» has become a major policy concern for universities in recent years (Laredo, 2007; Molas-Gallart and Casto-Martinez, 2007; Vorley and Nells, 2008). Regional contexts have influenced universities for centuries. Nevertheless, the idea of higher education institutions (HEIs) having a «regional mission» is relatively new, and an understanding of the regional dimension of universities' activities has only recently been broadly shared amongst many of the established universities. Throughout many countries, since the mid-1990s, universities have been encouraged to adopt a stronger and more direct role in fostering innovation and entrepreneurship in their regions.

Nowadays, in both policy and academic literature, a great deal of effort is devoted to creating closer links between a university and its region. Universities are placing a

142

higher priority on being relevant and responsive to broader stakeholder needs, and these efforts have resulted in the objective of «improving regional or national economic performance as well as the university's financial advantage and that of its faculty» (Etzkowitz and Leydesdorff, 2000; p.313). Although the regional contribution of higher education is high on the policy agenda, it remains unclear how the institutions actually function, and what their new responsibilities entail (Arbo and Benneworth, 2007). Some authors point out that universities are embedded in local history and environments, with highly complex wider networks and social connectivity (Goddard and Chatterton, 1999; Goddard and Vallenge, 2013). Furthermore, their regional role is of increasing concern not only to local, regional and national policymakers, but also to university managers (Charles, 2003; Davey, 2017; Galán-Muros *et al.*, 2017).

This paper aims to examine the evolving third mission policies that affect the links between universities and their regional agendas on one hand, and the development of institutional strategies and management practices at the university level on the other. More specifically, we review the development of such missions in the United Kingdom over the last 20 years, during which UK government policy has highlighted the links between research, higher education and economic growth through a number of reviews and reports (e.g. DTI, 1998; Lambert, 2003; Sainsbury, 2007; Wilson, 2012; Witty, 2013). In recent years, the UK has become «a more and more divided society with inequality between the regions as marked as it has ever been» (McCann, 2016). Recent political devolution processes, and current uncertainties resulting from Britain's impending exit from Europe (Brexit), provide further challenges to both regions and universities. This paper examines the evolution of universities' regional mission in such societal contexts, including institutional practices and the possible inter-links between government policies, and reviews the performance of different third mission activities at the regional level.

In doing so, we should be aware of the broader transformation of the nature and very purpose of universities over the last two decades which runs alongside the development of the third mission policy and activities. More than a decade ago, several authors analysed the impact of marketisation, privatisation and neo-liberalism on universities (Boden *et al.*, 2004; Nedeva and Boden, 2006), depicting «new managerialism» as ideology in higher education (Deem and Brehony, 2007). What is distinctive in the UK throughout this process is the «institutionalisation» (Geuna and Muscio 2009) of the third mission, and more recently «incentivisation» (Kitagawa and Lightowler, 2014; Upton *et al.*, 2014; Rosli and Rossi, 2016) through national and sub-national policies, as well as mechanisms developed at the institutional level. This could be «turned into a scoring and ranking mechanism that could shape funding» (Molas-Gallart *et al.*, 2002, p.55). These developments and tensions are part of the forces that define the regional dimension of third mission policies and practices.

The rest of the paper is structured as follows. Section 2 reviews key issues surrounding the third mission policies and institutional practices in the regional con-

texts by drawing on an international literature. Historical backgrounds of the UK third mission policy development over the last 20 years are presented in Section 3. Subsequent sub-sections illustrate regional variations in terms of third mission policies and performance, illustrated by empirical data on a range of different third mission activities across 12 regions in the UK. Section 4 draws on the concept of «regional logics of action» (Lebeau and Cochrane, 2015), and discusses the organisational diversity, emerging institutional strategies, and management practices at different types of HEIs and a variety of contexts. Section 5 highlights the tensions and challenges of the higher education sector in the UK, given the broader transformation of the UK higher education system over the past two decades. The paper concludes by discussing both opportunities and challenges faced by the UK universities and regions, with particular reference to management implications at the local and regional levels.

## **2. REVIEW OF LITERATURE - DEFINING THE «THIRD MISSION» AND THE REGIONAL CONTEXTS**

Universities' contribution to regional development is increasingly seen as their mission, but institutional contexts and the extent of their strategic resource allocation varies substantially. Changes in the external environment in terms of markets, regulations and policies have a significant impact. Universities manage interactions with stakeholders, not only at a regional level but also on other scales, and (re-) position themselves in relation to a variety of opportunities and challenges.

The third mission of universities is defined as «generation, use, application and exploitation of knowledge and other university capabilities outside the academic environment» (Molas-Gallart *et al.*, 2002, p. 2). Terms such as «technology transfer», «research mobilisation», «research commercialisation», «university-business cooperation», «public engagement», «research utilisation» and «valorisation activities» refer to processes or activities related to different types and forms of knowledge flows and interactions (also known as knowledge transfer/exchange), involving academic researchers engaging with external stakeholders such as businesses, policy-makers, practitioners, and the general public. Davey (2017) identifies four key areas of debate related to third mission: 1) the focus on public versus private good; 2) the relation to university-business cooperation and entrepreneurship; 3) the relation to theory; and 4) the stakeholder perspective. This paper highlights the regional dimension of the third mission across all of these themes. We consider universities' regional mission as a specific domain of third mission activities (see the paper by Benneworth *et al.*, this issue), which also interacts with teaching and research.

The third mission and regional mission of universities have been promoted and developed as a strand of public policy over the last 30 years, and are increasingly seen as priority areas for research and innovation policy development in

many industrialised countries including the UK. We should also note that the fundamental spirit, purpose and expectation of universities have all shifted over the past few decades through marketisation forces. Since the 1980s, HEIs across many countries have been under pressure from governments to actively contribute to the social and economic development of their regions, and to take a prominent role within national and regional innovation systems (Goddard and Chatterton, 1999; Slaughter and Rhoades, 1996). Since the mid-1990s, both academic literature and international agencies have drawn attention to issues specifically involving a university as «a regional actor» (Goddard, 1997; OECD, 2007). Consequently, since the beginning of the 2000s, topics related to higher education have become the subject of burgeoning interest in regional development and related areas of study (Harrison and Turok, 2017).

A growing number of public agencies concerned with local and regional development are looking to universities as local assets to play a key role, and more importantly, have financial resources at their disposal to encourage the «localisation of universities» (Goddard, 1997, p.24). For each university, in turn, with fewer public resources available for higher education, there is a need to place a higher priority on being «responsive to their local and regional communities' needs», and on being «useful to society», in order to maintain public support (Shattock, 1997, p.27). However, attention to regions and their assets inevitably raises the question of «what governance arrangements can enable a plurality of institutions, firms, communities and individuals in the region to leverage their assets to meet their (diverse) goals» (Allison and Eversole, 2008, p.102).

As Power and Malmberg (2008) argue, while we agree that universities contribute to innovation it is less clear how they contribute to regional innovation, and still less clear how they contribute to regional innovation systems, particularly within the specific conditions of periphery regions. Universities can be conceptually articulated as actors as part of the «regional innovation systems» (Cooke *et al.*, 1997; Cooke, 2004), but the question of whether and to what extent knowledge transfer/exchange and learning occur at regional and other (national and global) levels remains empirical (see Leydesdorff *et al.*, 2002). Certain university-industry linkages are locally specific, whilst in some cases linkages could be at any level (i.e. local, regional, national and international). The spatial dimension of these relations is far from simple and uniform (D'Este and Iammarino, 2010; Laursen *et al.*, 2011). Recent policy seems to be concerned with the need to better align or match universities' regional knowledge producing networks with regional firms (Uyarra, 2010). However, many universities are in fact not only being called upon to act as regional sources of knowledge and skills, but also to draw on their prominence to act as international hubs, which may benefit regional development.

Recent literature on the «engaged university» and «civic university» (Chatterton and Goddard, 2000; Gunasekara, 2006; Goddard and Vallance, 2013) presents a

broader and more adaptive role for universities, embedding a stronger regional focus and need within their missions. These wider views of engagement include the contribution of higher education to social, cultural and environmental development, and formal and informal participation and external representation as an institutional actor in regional networks of learning, community engagement, leadership and governance (Boucher *et al.*, 2003; Pinheiro *et al.*, 2012; Benneworth *et al.*, 2013; Benneworth *et al.*, 2017; Addie, 2017).

In sum, universities are increasingly «entrusted with a regional mission» (Arbo and Benneworth, 2007). The «triple Helix» model of university-business-government interaction (Etzkowitz, 2008) has been increasingly articulated at the regional level with a variety of regional innovation conditions (Lawton Smith, 2007). Universities have become pivotal «ingredients» to policy assumptions about how to generate the knowledge-related potential of regional and urban innovation strategies, particularly in those peripheral regions (Pinto *et al.*, 2015; Huggins and Johnston, 2009; Benneworth and Hospers, 2007; Morgan and Nauwelaers, 2002; Pugh, 2016). There seems to be prescribed and normative roles for universities as economic drivers and civic leaders in terms of maximising their contributions to territorial innovation processes, ranging from raising productivity, investments, and economic competitiveness, to social well-being and quality of life in the wider sense in communities. Recent work has begun to question the high level of policy expectations, with little understanding of the actual processes of knowledge flows and the extent to which regional economic and social development can actually be achieved through the utilisation of university knowledge (Power and Malmberg, 2008).

Given these developments of policy expectations and academic understanding of the roles of universities in the regions, the rest of the paper reviews the UK policy contexts, the evolution of the «regional mission», and how universities have developed their own strategies and practices in response to opportunities and challenges.

### **3. EVOLUTION AND DIVERSITY OF THE 'REGIONAL MISSION' AS OBSERVED IN THE UK HIGHER EDUCATION SECTOR 1997-2017**

#### **3.1. Third mission policy structures at the sub-national and national levels**

In the UK, while research policy is governed at the UK national level, with policy interactions and funding governed at the European and international level, higher education policy is a devolved matter across England, Scotland, Wales and Northern Ireland. Scotland, Wales and Northern Ireland are called «devolved regions» or «devolved administrations». The process of political devolution, through which some powers and responsibilities related to science and innovation policy are devolved to regional governments, adds some nuance to the policy development and implementation processes at the regional level in the UK. The structures and strategies of devolved economic governance are complexly interrelated, shaped by pat-



terns of intergovernmental interaction and existing institutional structures of economic governance between national and sub-national actors (Jones *et al.*, 2005; Cooke and Clifton, 2005; Huggins and Kitagawa, 2012).

Although the divergence of higher education policies predates devolution in different areas (namely, England, Wales, Northern Ireland and Scotland) in the UK, this has become more marked over the last two decades (Universities UK 2008). The effect of «regional devolution» on higher education, research funding, and the governance and management of third mission activities is a growing area of policy and academic concern (Lyll, 2007; Huggins and Kitagawa, 2012; Kitagawa and Lightowler, 2013). Furthermore, the recent devolution process in England, with growing importance put on city-regions, is adding another layer of complexity to the multi-spatial governance structures of science, research and innovation. There are new expectations for universities to work with other stakeholders towards local economic development, taking new local leadership roles and leading new industrial strategies (see Universities UK, 2017; Flanagan and Wilsdon, 2017).

It should be noted that the UK national science and research policy has had sub-national territorial impacts over the years. The quality of the research conducted in UK universities has been assessed by the Research Assessment Exercise (RAE) and more recent Research Excellence Framework (REF), which drives a funding formula aiming to reward world-class research «excellence». Such a research funding allocation model, it is argued, has reinforced the concentration of resources allocated to HEIs in the so-called Golden Triangle, the areas surrounding London, Oxford and Cambridge with the highest number of research intensive universities (Flanagan and Wilsdon, 2017). Therefore the regional funding contexts of universities are highly differentiated within the UK.

Across the four higher education systems (namely, England, Wales, Northern Ireland and Scotland), HEIs have been supported by a series of initiatives aimed at strengthening third mission activities, funded by the respective funding bodies and government organisations. Third mission policies in these four systems are influencing each other, while there are some differences in terms of the size of the systems, resources, and the funding allocation mechanisms between them (see Table 1 below). To illustrate some of the characteristics of the four higher education systems and their developing regional agendas shaped by both national and sub-national actors, a brief description of the evolution of third mission funding mechanisms in each of the four higher education systems since the late 1990s and early 2000s follows below.

### **3.2. Third mission policies in the four (regional) higher education systems**

In England, the Higher Education Funding Council (HEFCE) has funded «third stream» initiatives since the late 1990s, initially through the Higher Education Reach Out to Business and the Community initiative (HEROBC) and, since 2001, through



**Table 1. THIRD MISSION FUNDING MECHANISMS IN THE FOUR UK HE SYSTEMS**

	England	Scotland	Wales	Northern Ireland
Number of HEIs <sup>1</sup>	133	18	9	4
Funding council	HEFCE	SFC	HEFCW	NA (Department for Economy)
Key third mission funding initiatives	HEROBC (~2000) HEIF	KTG (~2015) UIF	HEED 3M IEF (~2015)	HEIF (~2004) NI HEIF
Current Funding methods	Formulae based	Baseline funding & A variable element	Formulae based	Formulae based
Recent third mission funding size (£) <sup>2</sup>	HEIF £160 M (2016/17)	UIF £12.2M (2017/18)	Ceased 2014/15	NI HEIF £4m per annum

Source: HEFCE, SFC, HEFCW, Department for Economy. Collated by the author.

<sup>1</sup> Number of HEIs are identified from HEBCI return data 2015/16 (HESA 2017).

<sup>2</sup> HEFCE, SFC, Department for Economy websites Accessed 10 July 2017.

the Higher Education Innovation Fund (HEIF). These efforts have led to a considerable expansion of knowledge exchange infrastructure and capabilities in HEIs (PACEC, 2012). The mechanism for allocating third mission funding has also evolved (see Rosli and Rossi, 2016). Earlier rounds of HEIF funding were based on project-based competitive bidding, and a number of projects were funded for a regional consortium of HEIs. However, it was recognised that project-based funding allocation created «long-term instability» and prevented the development of the long-term institutional strategies for third mission activities. HEIF is currently based on a formula using the share of overall knowledge exchange (KE) income as reported in the annual Higher Education Business Community Interaction (HEBCI) survey. This reflects the government's hope to facilitate more strategic institutional planning (HEFCE/OST, 2005). Several impacts of HEIF have been demonstrated (Coates-Ulrichsen, 2015); for example, it was recently shown that HEIF helps universities to work constructively with Small and Medium Enterprises (SMEs), and to develop local regional clusters of businesses (Universities UK, 2017).

Under the new Labour government (1997-2010), in close collaboration with the higher education sector (Kitagawa, 2004; Warren *et al.*, 2010), regional economic strategies in England were carried out by nine Regional Development Agencies (RDAs) which ceased to exist on 31 March 2012. Since 2010, local economic development strategies have been undertaken by 39 Local Enterprise Partnerships (LEPs)

(see Pike *et al.*, 2015). Arguably, the redistribution of power and funding from national to local government has occurred through a series of «devolution deals» and the development of LEPs. Many universities are involved in LEPs as strategic actors at the city-region level (Charles *et al.*, 2014).

It is argued that Scotland was the first «devolved region» in the UK to seize the opportunity to develop a regional science policy. The regional science policy model in Scotland promotes new institutionalised strategies for universities and the funding council, including knowledge exchange activities and strategic approaches to research funding and resources, in order to compete in a globalizing knowledge economy with an increased emphasis upon regional policy agendas through devolution processes (Lyall, 2007; Huggins and Kitagawa, 2012). There are two regional economic development agencies in Scotland, Scottish Enterprise and Highlands and Islands Enterprise, working closely with industries and collaborating with the Scottish Funding Council (SFC) on third mission and innovation agenda. In Scotland, a clear framework of outcomes and indicators for the public –the National Performance Framework– has been established since 2007. One of these outcomes is to «Improve knowledge transfer from research activity in universities» (SFC, 2007).

In Scotland, since 2001/2, the Knowledge Transfer Grant (KTG) has been the main funding stream for third mission activities, providing universities with a flexible funding stream to support a variety of activities. Performance is measured using *KTG metrics* from HEIs. In addition, between 2009 and 2013, the SFC ran a competition, called Strategic Priority Investment in Research and Innovation Translation (SPIRIT), in search of proposals addressing the needs of Scotland's key industries (life sciences, energy, financial and business, creative industry, food and drink, and tourism), and the policy community. There are also funding initiatives targeting «demand-driven» exchange of knowledge such as the Innovation Voucher scheme, aiming to develop relationships between SMEs and HEIs (Kitagawa and Lightowler, 2014). Recently, in 2016/7, the University Innovation Fund (UIF) replaced the KTG with a similar set of metrics.

In Wales, the Welsh Assembly Government's (WAG) Action Plan for Innovation (WAG, 2002) was one of the first post-devolution policy documents to outline an innovation strategy at the «regional» level. The key post-devolution third mission activities funded in Wales included: Centres of Excellence for Technology and Industrial Collaboration; the Wales Spinout Programme; a Patent and Proof of Concept Fund; Collaborative Industrial Research Partnerships; Technology Transfer Networks; Technology Transfer Centres; and the «Technium» initiative, with particular emphasis given to the development of incubator facilities.

The Higher Education Funding Council for Wales (HEFCW) created the Higher Education Economic Development Fund (HEED) in 2002/3 by combining different strands of funding initiatives. In 2004/05, the HEED Fund evolved into the Third Mission (3M) Fund to better reflect the full range of HEIs' third mission activities, with the

bulk of the funding allocated on a formula basis. From 2008, the support available for third-mission activities substantially increased via the Welsh Assembly, which was successful in attracting around £50 million from the European Regional Development Fund (ERDF) for two knowledge exploitation and transfer programmes jointly branded as Academia for Business (A4B) (Huggins and Kitagawa, 2012). The HEFCW replaced the 3M Fund and created the new Innovation and Engagement Fund (IEF), which started in 2010/11. In 2012, however, following financial pressures on budgets arising from the Council's obligations to support the new student fee arrangements, it was announced that HEFCW's Innovation and Engagement Fund (IEF) would be reduced by 50% in 2013/14, and removed entirely in 2014/15 (HEFCW, 2013). Consequently, there is no dedicated third mission funding stream available in Wales right now.

Unlike other parts of the UK, Northern Ireland has no higher education funding council. After the Department for Employment and Learning of Northern Ireland (DELNI) was dissolved in 2016, the Department for the Economy created the Higher Education division, which fulfils the roles of both a government department and a funding council. Before 2004, Queen's University Belfast and University of Ulster received third mission funding from the HEFCE through HEROBC and HEIF funding.

Since 2004/5, DELNI and the Department for Economy have funded the Northern Ireland Higher Education Innovation Fund (NI HEIF). The NI HEIF provides core funding to encourage the higher education sector to increase their capability to respond to the needs of business (including companies of all sizes) and the wider community, with a clear focus on the promotion of wealth creation. The long-term aim of this funding is to improve Northern Ireland's innovation performance as a key element in raising productivity and delivering economic growth. This core funding is currently approximately £4m per annum (Department for Economy, 2017). In addition, there is a programme for both higher and further education, «Connected», which acts as a «one-stop-shop for companies wishing to access the technology and knowledge capital within the local research base, taking them right through the whole process from problem definition through to solution identification and implementation» (Department for Economy, 2017).

### 3.3. Regional diversity of third mission activities

As McCann (2016) points out, and other sources evidence, the disparities between regions in the UK in terms of GDP per capita have grown over the last twenty years (Arnold and Blöchliger, 2016; Martin *et al.*, 2016). Adopting the European Nomenclature of Territorial Units for the United Kingdom, the UK is divided into 12 major economic regions (NUTS-1), 37 basic regions for the application of regional policies (NUTS-2), and 139 small regions (NUTS-3). Recent studies focusing on the roles of universities in the regions (e.g. Harrison and Leitch, 2010; Huggins and Kitagawa, 2012; Guerrero *et al.*, 2015; Zhang *et al.*, 2016) highlight the varied nature of the regional economies, and the existing differences in HEIs' third mission activities across the UK.

Across the four higher education systems in the UK, accumulated data on third mission activities has been collected at the institutional level over the last 18 years. The Higher Education Business Community Interaction (HEBCI) survey collects annual information on income from a range of university-led third mission activities including commercialisation of research, delivery of professional training, consultancy, the use of equipment and facilities, and income from activities intended to have direct social benefits. The HEFCE originally started to collect data on behalf of all UK HEIs in the academic year 1999/2000. This data is currently collected by the Higher Education Statistics Agency (HESA).

Based on the annual data from the HEBCI survey, it is possible to present the regional profiles of the third mission activities and performance across the 12 NUTS-1 regions. An investigation of how the 12 NUTS-1 UK regions –Scotland, Wales, Northern Ireland and nine regions in England– compare with each other in terms of third mission performance would reveal the influence of the regional forces, including political devolution processes, diverse economic governance structures evolving at the regional level, and the different industry structures of these regions. This paper only provides some descriptive illustrations of regional third mission performances.

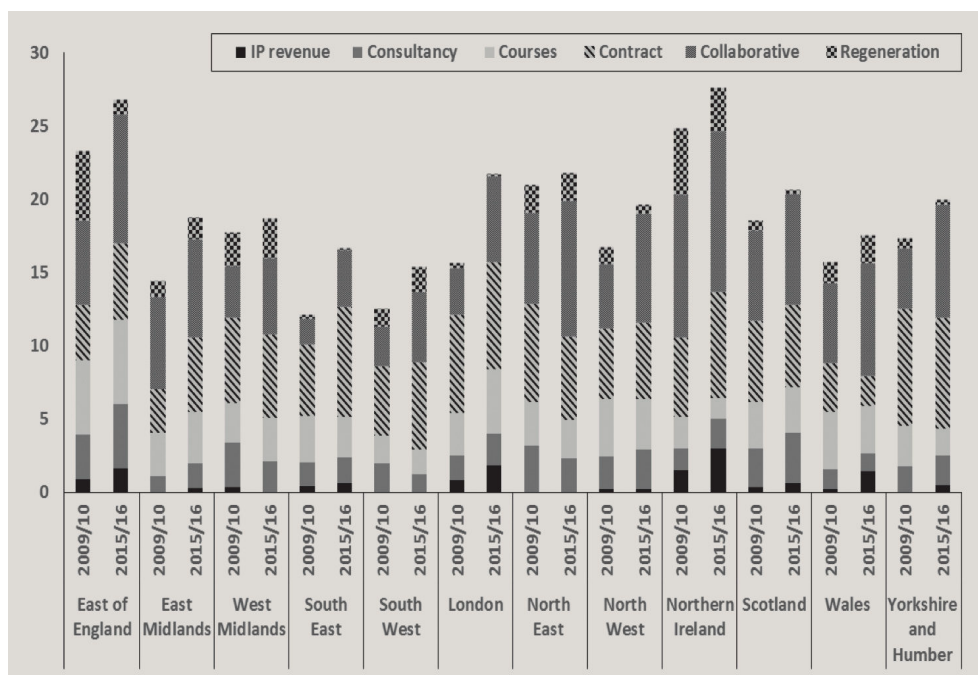
Figure 1 shows income from aggregated third mission activities across the 12 regions, comparing the data from two academic years –2009/10 and 2015/16– (HESA, 2017). Performance of third mission activities is presented here in terms of annual income from specific activities aggregated. All the income figures in this paper are presented as nominal rather than real. These include: *total Intellectual Property (IP) revenues (£000)*; *total income from consultancy contracts (£000)*; *total income from collaborative research activities (£000)*; *total income from contract research (£000)*; *total revenue from courses for business and the community, Continuing Professional Development (CPD) courses and Continuing Education (CE) (£000)*; and *income from regeneration and development programmes (£000)*. To control for the difference in the size and number of HEIs in each of the regions, the income from different types of third mission activities is divided by the number of academic staff (Full Person Equivalents -FPE) in the same academic years. The 12 regions include nine regions in England –East of England, East Midlands, South East, South West, North East, North West, West Midlands, Yorkshire and Humber, and London; Scotland, Wales and Northern Ireland–.

There are variations in the performance of universities' specific third mission activities in each region. IP revenues are relatively high in the East of England, London, and Northern Ireland.<sup>1</sup> Comparing 2009/10 and 2015/16, revenues from most of the above-mentioned third mission activities have increased during this period, with the exception of income from regeneration and development programmes. The

<sup>1</sup> With regard to IP and university spin-offs, there may be a trade-off choice being made between seeking revenues from the protection and licensing or sale of IP, and the creation of spin-off companies that will, in due course, realise a capital gain through the sale of shares, particularly in peripheral regions (Harrison and Leitch, 2010).

total revenue from regeneration and development programmes in 2015/16 was £162,736,000, and £213,403,000 in 2009/10, which included revenue from RDA programmes (£92,677,000).

Figure 1. **REGIONAL ANALYSIS OF INCOME FROM SELECTED THIRD MISSION ACTIVITIES PER FPE ACADEMIC STAFF (£000) COMPARING 2009/10 AND 2015/16**

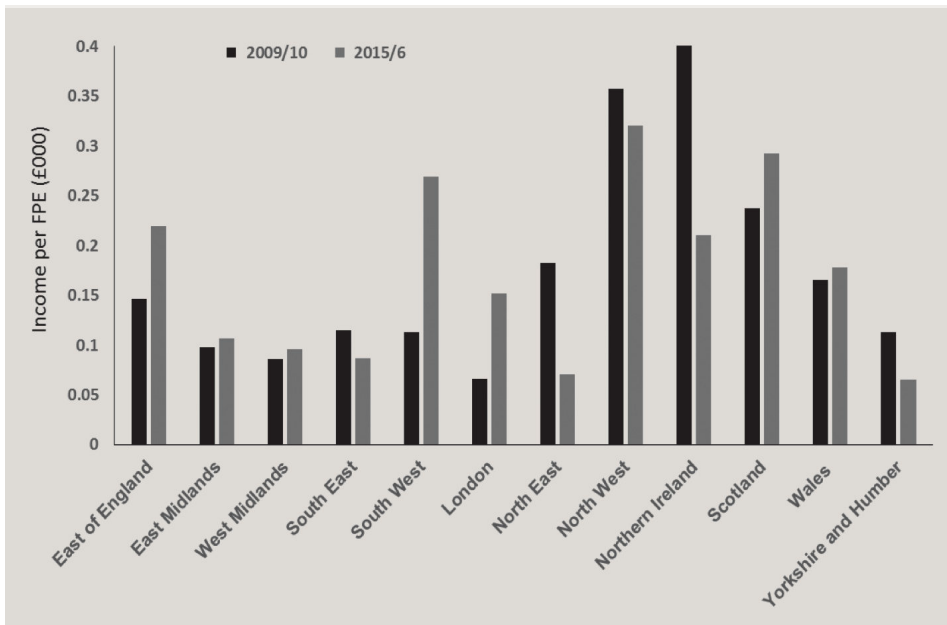


Source: HESA: 2017 - HEBCI 2015/16 and 2009/10; Staff data 2015/16 and 2009/10.

Figure 2 compares income from consultancy activities with SMEs, per full person equivalent (FPE) academic staff, in 2009/10 and 2015/16. Some regions show substantial growth in the revenue generated through consultancy work with SMEs (South West, East of England, London, and Scotland). In the 2009/10 HEBCI survey, data is collected on the income from third mission activities from the HEIs' RDA area.

Across the 12 regions, there is a major variation when comparing the ratio of the consultancy income with the SMEs in the HEIs' own RDA area (Figure 3). HEIs in several regions in England (East of England, South West, North East, Yorkshire and Humber) have more than 50% of income from SMEs in their own regions. It is notable that HEIs in Wales and Scotland –with the devolved administrations promoting regional science and innovation strategies– have the lowest figures in 2009/10. There is no equivalent data in the HEBCI currently, so it is not possible to compare the changes after the demise of the RDAs in England.

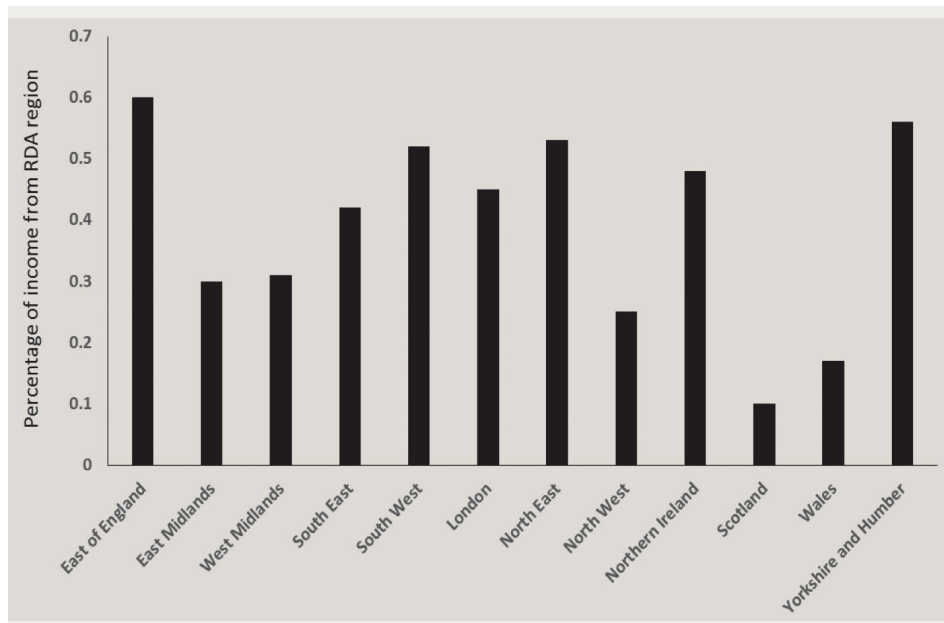
Figure 2. **CONSULTANCY INCOME WITH SMES PER FPE ACADEMIC STAFF (£000) IN 12 REGIONS COMPARING 2009/10 AND 2015/16**



Source: HESA: 2017 - HEBCI 2015/16 and 2009/10; Staff data 2015/16 and 2009/10.

Looking at university entrepreneurial venture activities, the HEBCI data shows four categories of university ventures: «formal spin-off with academic IP ownership», «spin-off with university IP ownership», «staff start-up», «graduate start-up», and «social enterprise». Figures 4a and 4b illustrate two types of university venture activities - «spin-off with university IP ownership» (University Spin-Offs (USOs)), and graduate start-ups (within two years of graduation, with some support from the HEI). Figure 4a shows the average number of ventures created per institution, and Figure 4b shows the average estimated turnover of the active firms in 2009/10 and 2014/15 created by the HEIs in each of the 12 regions. Whilst the number of new USOs has not grown much over the period, in most of the regions (except North East and South East), the number of graduate start-ups created in 2014/15 is much higher than 2009/10. In general, the number of graduate start-ups exceeds the number of USO creations per year, but the estimated turnover from USOs seems to be higher than for Graduate start-ups. In the 2014/15 data, however, it is worth noting that average turnover from graduate start-ups is higher than that of USOs in the North East, East Midlands and North West. The impact of graduate start-ups would require further examination, particularly for the «non-core» regions. Northern Ireland shows a particularly high revenue from USOs, and very few graduate start-ups.

Figure 3. **RATIO OF CONSULTANCY INCOME WITH SMES IN THE HEIS' RDA AREAS (2009/10)**



Source: HESA: 2017 - HEBCI 2015/16 and 2009/10; Staff data 2015/16 and 2009/10.

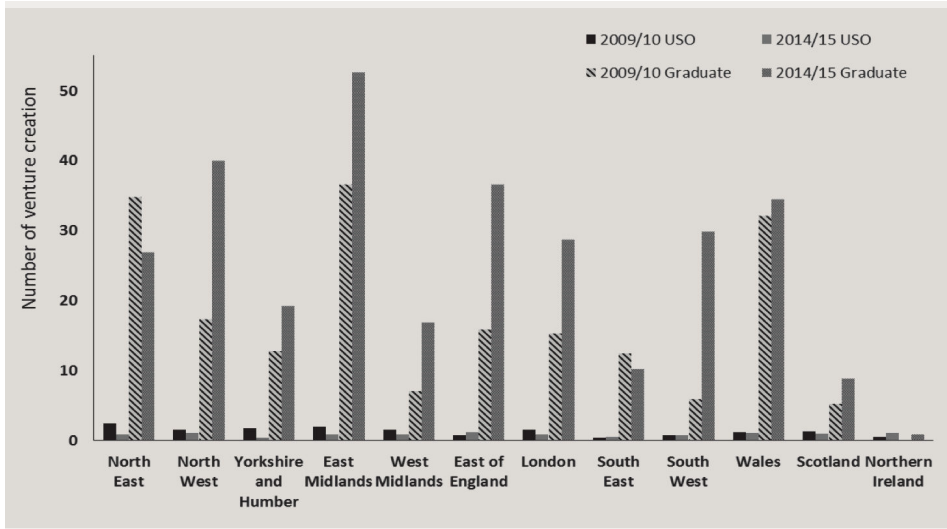
As pointed out earlier, the national research funding landscape has contributed to the regional disparities between the Golden Triangle surrounding London and the North of the country (Flanagan and Wilsdon, 2017). Harrison and Leitch (2010) argue that regional variations exist not just in terms of «institutional policies and practices», but also of «access to capital markets and the advisors (venture capital investors, corporate finance advisors, and stockbrokers/nominated advisors) that support the process of listing a company on public stock markets», creating differences between the regions. Mueller *et al.* (2012) discuss the roles of HEIs in attracting investment to USOs in non-core regions, outside the South East and London.

So far, the regional characteristics of the third mission activities are illustrated by looking at the regionally aggregated income data. We should also note that each region has mixes of different universities, each having different history, regional identities and relationships to different stakeholders. The next section turns to look at the organisational diversity behind third mission activities and strategies.



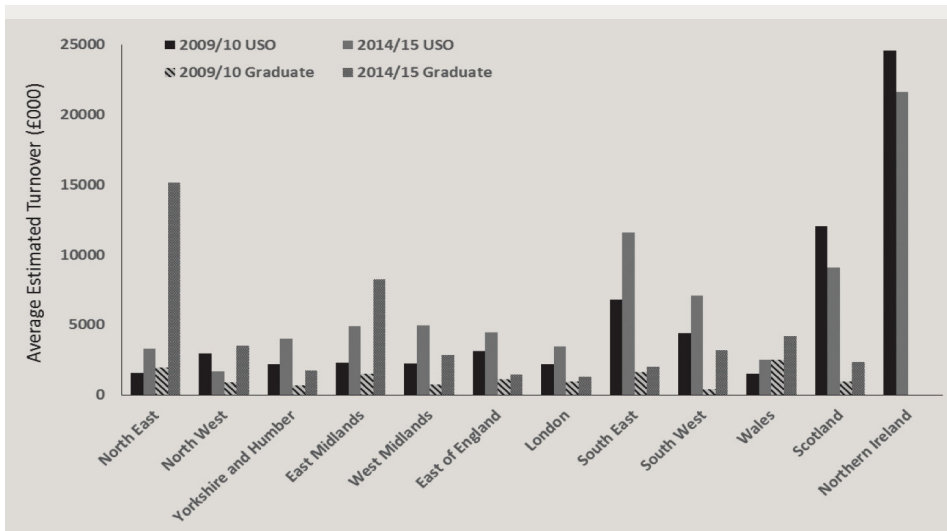
Figure 4. **COMPARING USO AND GRADUATE START-UP PER INSTITUTION IN 2009/10 AND 2014/15**

Figure 4a. **NUMBER OF UNIVERSITY VENTURE CREATIONS PER INSTITUTION**



Source: HESA, 2017; HEBCI (2009/10 AND 2014/15)).

Figure 4b. **AVERAGE ESTIMATED TURNOVER (£000) BY DIFFERENT TYPES OF UNIVERSITY VENTURES**



Source: HESA, 2017; HEBCI (2009/10 AND 2014/15)).

#### 4. ORGANISATIONAL DIVERSITY AND EVOLUTION OF THIRD MISSION STRATEGIES IN THE UK

Universities vary because of their histories, values, organisational culture, aspirations and perceived reputation (Kenney and Goe, 2004; Scott, 2014; Lebeau and Cochrane, 2015). Recent studies in the UK both qualitatively and quantitatively demonstrate that different types of universities have different mixes of triple helix activities and relationships across a variety of regional and organisational contexts (Hewitt-Dundas, 2012; Guerrero *et al.*, 2015; Lebeau and Cochrane, 2015; Abreu *et al.*, 2016; Kitagawa *et al.*, 2016; Sánchez-Barrioluengo *et al.*, 2016).

In the UK, there is increasing evidence of academic institutions taking a pro-active approach towards the ideal of the «entrepreneurial university», through the engagement of both individuals and organisations (Abreu *et al.*, 2016; Zhang *et al.*, 2016). This involves adopting an entrepreneurial role in collaborations with industry, for example through research contracts, consultancy, licensing of patents, creation of spin-off companies, and so on. University strategies for these activities and relationships have been evolving over time, and reinforce each other (Sengupta and Ray, 2017). As the third mission development gains momentum, with the help of third mission funding initiatives as mentioned in Section 3.1, the modification of the HEI organisation has led to a wider diversity of structures to nurture the third missions, such as technology transfer offices (TTOs), incubators and other specialised intermediary organisations bridging the gap between HEIs and non-academic stakeholders. Sometimes, these specialised organisations focus on relationships with SMEs in their locality.

Furthermore, the extent and ways in which these third mission activities involve territorial dimensions is conditioned by a set of complex factors and relationships. These include the characteristics of the institution, discipline areas, the nature of the activities, institutional missions and organisational strategies, policy incentives and contexts of the «place» including history, and relationships with industry and other HEIs (see Boucher *et al.*, 2003; Pinheiro *et al.*, 2012; Goddard *et al.*, 2014; Lebeau and Cochrane, 2015). Different types of universities respond to external pressures differently. Recent studies analysed varying impacts the financial crisis and austerity have had on different types of universities in the regions in the UK (Charles *et al.*, 2014; Goddard *et al.*, 2014), and different ways in which the universities responded by re-shaping their third mission activities with specific partners both locally and internationally (Kitagawa *et al.*, 2016; Sánchez-Barrioluengo *et al.*, 2016).

These sets of activities run alongside and interact with the research and teaching missions as observed in the UK and other countries (Goddard and Chatterton, 1999; Molas-Gallart and Casto-Martinez, 2007; Sánchez-Barrioluengo, 2014; Galán-Muros *et al.*, 2017). As Sengupta and Ray (2017) argue, universities are conceptualised as standing on two pillars. One pillar provides the foundation for its traditional

role as a centre of education and research, and another provides the foundation for its third mission activities encompassing knowledge exchange and other forms of engagement. These two pillars are interdependent, while different types of universities (e.g. research-intensive, vocationally oriented) and academics working in different discipline areas with different types of knowledge exchange activities (e.g. teaching-oriented such as CPD and training, or research-oriented such as collaborative research and consultancy) configure these relationships differently (Abreu *et al.*, 2016; Kitagawa *et al.*, 2016).

We must recognise that universities are not specifically regionally «bounded» in pursuing their missions (Benneworth and Kitagawa, 2017). Universities are complex organisations, nested within national policy frameworks (Uyarra, 2010) as well as international networks and global communities, trying to «join up» processes at different levels and integrate the teaching, research, entrepreneurial and community elements of engagement (Charles, 2003; Perry and May, 2007; Benneworth *et al.*, 2013). Consequently, this poses challenges and tensions for the university managers and leaders. How can the university balance each mission, which may be closely aligned with the needs of their region and external stakeholders' demands? The alignment of the different missions or pillars would require reconciling policies and incentives at various levels of governance (Kitagawa and Lightowler, 2013), both externally and from within the university. Understanding of incentives needs to be based on the view that teaching, research and third mission activities are all «interactive processes with numerous feedback loops» (Jongbloed and Zomer, 2012, p. 99–100), rather than a linear process. Individual academics reconcile their own identities in balancing these different activities (Jain *et al.*, 2009; Ambos *et al.*, 2008). Institutional leaders and managers should also bear in mind that timescales for such actions can be very long and the impact maybe indirect, unintended, and sometimes negative (Lebeau and Cochrane, 2015).

## 5. **WHITHER UK HIGHER EDUCATION AND ITS REGIONAL MISSION? REPOSITIONING IN THE NEW SPATIAL RELATIONSHIPS**

The «regional logics of action» of universities and their discourses of local engagement' have been developing, but cannot be isolated from the forces of «high vertical inter-institutional differentiation» (Lebeau and Cochrane, 2015, 259) characterising the sector in the UK and increasingly across Europe and elsewhere (Kitagawa and Oba, 2010).

Lebeau and Cochrane (2015, p. 259) argue:

«At the root of this stratification is the competitive (and now quasi market) nature of a system in which universities compete for resources and students, while remaining subject to fairly strong forms of central regulation».

These national systems of stratification are now being reflected in the organisational level. Many universities have been moving towards a more «hierarchical and centralised structure, with top-down planning and reduced local autonomy for departments» (Lebeau and Cochrane, 2015, p. 259), with a dramatic rise in the number of central university administrators and support staff (Cooke and Kitagawa, 2013; Martin, 2017), including those specifically engaged in local engagement and knowledge exchange.

In recent years, the UK higher education has been at the centre of major policy shifts, arguably accelerating the pathways towards marketisation and privatisation, and transforming the nature and objectives of the universities. The missions of universities have been transformed throughout such processes, which affect the regional mission (Lebeau and Cochrane, 2015).

In terms of research, as mentioned earlier, in replacement of the Research Assessment Exercise (RAE), the Research Excellence Framework (REF) is used to assess the quality of the research in UK universities, and drives a funding formula. With the aim of pursuing world-class research «excellence» while addressing economic or societal needs, the recent UK REF added the assessment of «impact» to the existing assessment of research excellence. The third mission of universities has been recently re-aligned with the national discourse around the «impact» that is expected from research and knowledge exchange activities (e.g., HEFCE 2011), many of which will have territorial dimensions.

In terms of teaching, the English universities underwent a radical shift in 2012 with the introduction of significantly enhanced fees for all home and EU students, combined with a drastic reduction in direct public expenditure in higher education. The Teaching Excellence Framework (TEF) was introduced in England in 2016 as a trial year. The Government has previously indicated that universities and colleges in England that have a TEF award will be able to increase their tuition fees in line with inflation, whilst HEIs in Scotland, Wales and Northern Ireland are able to take part in the TEF with no direct impact on their tuition fees (HEFCE, 2017).

As already mentioned, third mission funding is allocated based on certain performance metrics of knowledge exchange activities. In England, HEBCI survey data has informed funding allocations for third stream activities of HEIF since 2006. This has led to «the design of instruments aiming to quantify (levels of activity and impacts) and ultimately monetize activities» (Lebeau and Cochrane, 2015, p. 251). Consequently, there are growing concerns that the focus of universities and policy-makers has been on the number, rather than the quality and the viability, of these activities (Harrison and Leitch, 2010).

Scott (2014) argues that particularly in England, the combination of these «reforms» in the past decade have, in effect, shifted attention away from any «regional contribution» towards «an obsession with national and global rankings». In addition, in England at least, the demise of the structures of regional development

governance represented by the RDAs since 2010, has also removed the regional institutional governance framework and some of the external pressures on regional engagement (Charles *et al.*, 2014). This may weaken the «regional logics of action», and risk de-territorialising the third mission. At the same time, new dynamics of the (re)territorialisation of higher education missions is taking place, both at sub-regional (e.g. city-region) and trans-regional levels (Harrison *et al.*, 2016). The recent government industrial strategy recognises the concentration of resources in the so-called Golden Triangle, trying some spatial rebalancing (Flanagan and Wilsdon, 2017).

On top of these national transformations and sub-national institutional dynamics, the UK is currently facing uncertainties related to Brexit. The implications of Brexit are still highly uncertain, and the topic is far beyond the scope of this paper. However, some of the current issues related to both higher education and regions in the UK need to be identified. The uncertainty of Brexit is affecting the UK regions, with a range of emerging issues including a potential skills shortage and financial impact, in particular, for those regions highly dependent on exports and the future of European funding and investment. The potential negative impact on both the creativity and productivity of UK science and innovation will affect the future of UK higher education and the regions. For the higher education sector, issues include recruitment of students from other EU countries, employment of academic and research staff from the rest of the EU, and research grants and income, such as «Framework» and «Horizon 2020» programmes and from public bodies and private companies in other EU countries (Scott, 2017). It is hard to tell how Brexit will affect the future of universities' regional mission in the UK. Brexit, along with the recent devolution process in England and the political contexts of the other devolved regions, adds further complexity to the «regional logics of actions» of individual universities.

## 6. CONCLUDING REMARKS

Given recent policy expectations (and mismatches), as well as academic understanding of the roles of universities in their regions, this paper discusses a variety of forces that define the regional dimension of third mission policies and practices. Empirically, this paper paints the evolution of the regional mission of UK universities over the last two decades with a broad brush. The paper aims to capture the evolving third mission policies that affect the links between universities and their regional agendas on one hand (*territorialisation* of third mission), and the development of institutional strategies and management practices at the university level (*managerialisation* of third mission), on the other.

The effects of «regional devolution» on higher education, research funding, and the governance and management of third mission activities over the last two decades were identified with growing incentivisation processes of these activities through dedi-

cated funding. Setting incentives for third mission activities encompasses complex processes at the policy, institutional, and individual levels. The paper discusses a range of organisational developments and tensions as part of third mission activities, and interlinks between the different missions of universities. The complexity of the «regional logics of actions» of universities are highlighted given the current policy obsession with national and international assessment and metrics, and a somewhat weakened institutional governance structure for the regional contribution, at least in England.

What the region means for a university is conditioned by a complex set of relationships and history. The existing regional variation in terms of the activities and performance of third mission activities is illustrated by drawing on the HEBCI data between 2009/10 and 2015/16, covering a broad range of knowledge exchange and entrepreneurial venture activities. Such a variation needs further scrutiny against growing disparities between the regional economies, and the nature of mixes of different universities in each region. There are new dynamics of local stakeholders both at the sub-regional and trans-regional level, which challenges the simplistic view of the «regional mission» consisting of the dichotomy between the national and the regional. These new dynamics may provide new opportunities for universities to become strategic actors and partners in creating the «innovation policy spaces» (Uyarra and Flanagan, 2010).

The state of UK universities' regional mission is in flux. Three key challenges for institutional practices seem to exist in relation to the regional contexts of third mission in the UK. First, how can universities incentivise academic staff to engage with stakeholders in the regional contexts (*against strong incentives to conduct world-class research*)? Secondly, how do universities engage students and embed their learning experiences in the regional contexts (*as well as ensuring teaching excellence*)? Thirdly, in what ways do universities communicate (*by going beyond metrics*) and sustain relationships with a wide range of stakeholders at the local and regional level?

## BIBLIOGRAPHIC REFERENCES

- ABREU, M.; DEMIREL P.; GRINEVICH, V.; KARATAS-OZKAN, M. (2016): Entrepreneurial practices in research-intensive and teaching-led universities, *Small Business Economics*, 47, (3), 695-717.
- ADDIE, J-P. D. (2017): From the Urban University to Universities in Urban Society, *Regional Studies*, 51, 7, 1089-1099.
- ALLISON, J.; EERSOLE, R. (2008): A new direction for regional university campuses: catalyzing innovation in place. *Innovation: The European Journal of Social Science Research*, 21:2, 95-109.
- AMBOS, T.C.; MAKELA, K.; BIRKINSHAW, J.; D'ESTE, P. (2008): When does university research get commercialized? Creating ambidexterity in research institutions. *Journal of Management Studies*, 45, 1424-47.
- ARBO, P.; BENNEWORTH, P. (2007): Understanding the regional contribution of higher edu-

cation institutions: a literature review Paris: OECD. [Online]. Retrieved on 7 June 2017 from: <http://www.oecd.org/dataoecd/55/7/37006775.pdf>.

- ARNOLD, F.; BLÖCHLIGER, H. (2016): «Regional GDP in OECD countries: How has inequality developed over time?», *OECD Economics Department Working Papers*, No. 1329, OECD Publishing, Paris. [Online]. Retrieved on 7 June 2017 from: <http://dx.doi.org/10.1787/5jl-pq7xz3tjc-en>
- BENNEWORTH, P. (2013): «The Engaged University in Practice?» in P. BENNEWORTH (ED.), *University engagement with socially excluded communities*, Dordrecht, Springer.
- BENNEWORTH, P.; HOSPERS, G. (2007): The new economic geography of old industrial regions: Universities as global/local pipelines. *Environment and Planning C*, 25(5): 779–802
- BENNEWORTH, P.; PINHEIRO, R.; KARLSEN, J. (2017): Strategic agency and institutional change: Investigating the role of universities in regional innovation systems. *Regional Studies*, 51(2), 235-248.
- BENNEWORTH, P.; KITAGAWA, F. (2017): Universities and regional development in the periphery, *Encyclopaedia of International Higher Education Systems and Institutions*, Springer.
- BODEN, R.; COX, D.; NEDEVA, M.; BARKER, K. (2004): *Scrutinising Science: The Changing UK Governance of Science*, Palgrave Macmillan.
- BOUCHER, G.; CONWAY, C.; VAN DER MEER, E. (2003): «Tiers of Engagement by Universities in their Region's Development», *Regional Studies* 37(9): 887-897.
- CHARLES, D. (2003): Universities and Territorial Development: Reshaping the Regional Role of UK Universities, *Local Economy*, 18, 7-20.
- CHARLES, D.; KITAGAWA, F.; UYARRA, E. (2014): «Universities in Crisis? New Challenges and Strategies in Two English City-regions», *Cambridge Journal of Regions, Economy and Society* 7(2): 327-348.
- CHATTERTON, P.; GODDARD, J. (2000): «The Response of Higher Education Institutions to Regional Needs», *European Journal of Education* 35(4): 475-496.
- COATES-ULRICHSEN, T. (2015): Assessing the economic impacts of the Higher Education Innovation Fund. <http://www.hefce.ac.uk/pubs/rereports/year/2015/heifeval/>
- COOKE, P. (2004): Regional innovation systems: An evolutionary approach. In P. COOKE, M. HEIDENREICH, & A. PICCALUGA (EDS.), *Regional innovation systems: The role of governance in a globalised world* (pp. 1–18). London: Routledge.
- COOKE, P.; URANGAMU M.G.; ETXEBARRIA, G. (1997): Regional innovation systems: institutional and organisational dimensions, *Research Policy*, 26 4/5, 475-491.
- COOKE, P.; CLIFTON, N. (2005): Visionary, precautionary and constrained 'varieties of devolution' in the economic governance of the devolved UK territories, *Regional Studies* 39, 437-451.
- COOKE, P.; KITAGAWA, F. (2013): «From state to market via corruption? Universities in an era of privatization», in R. SUGDEN, M. VALANIA & J.R. WILSON (EDS.), *Leadership and Cooperation in Academia*, Edward Elgar Publishing Limited.
- D'ESTE, P.; IAMMARINO, S. (2010): The spatial profile of university-business research partnerships. *Papers in Regional Science*, 89(2) 335-350.
- DTI (1998): *Our Competitive Future: Building the Knowledge-driven Economy*, London: Her Majesty's office.
- DTI/DFEE (2001): *Opportunity for all in a World of Change: A White Paper on Enterprise, Skills and Innovation*, London: Stationery Office.
- DAVEY, T. (2017): Converting university knowledge into value: how conceptual frameworks contribute to the understanding of the third mission role of European universities, *International Journal of Technology Transfer and Commercialisation* 15(1), 65-96.
- DEEM, R.; BREHONY, K. (2007): Management as ideology: the case of 'new managerialism' in higher education, *Oxford Review of Education* 31, 217-235.
- DEPARTMENT FOR ECONOMY (2017): *Higher Education Knowledge Exchange* <https://www.economy-ni.gov.uk/articles/higher-education-knowledge-exchange>
- ETZKOWITZ, H. (2008): *The triple helix: University-industry-government innovation in action*. London: Routledge.
- ETZKOWITZ, H.; LEYDESORFF, L. (2000): The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university-industry-government relations. *Research Policy*, 29(2), 109-123.



- FLANAGAN, K.; WILSDON, J. (2017): Powerhouse of science? Prospects and pitfalls of place-based science and innovation policies in Northern England, in C. BERRY & A. GIOVANNI (EDS.). *Developing England's North: The Northern Powerhouse, Devolution and the Political Economy of the Place*. SPERI Research and Policy Series.
- GALÁN-MUROS, V.; VAN DER SIJDE, P.; GROENEWEGEN, P.; BAAKEN, T. (2017): Nurture over nature: How do European universities support their collaboration with business? *Journal of Technology Transfer*, 42:184–205.
- GEUNA, A.; MUSCIO, A. (2009): The Governance of University Knowledge Transfer: A Critical Review of the Literature, *Minerva*, 47(1) 93–114.
- GODDARD, J. (1997): Managing the University Regional Interface, *Higher Education Management*, 9, (2) 7–28.
- GODDARD, J.; CHATTERTON P. (1999): Regional development agencies and the knowledge economy: harnessing the potential of universities, *Environment and Planning C* 17, 685–699.
- GODDARD, J.; VALLANCE, P. (2013): *The University and the City*. Routledge, New York.
- GODDARD, J.; COOMBES, M.; KEMPTON, L.; VALLANCE, P. (2014): «Universities as Anchor Institutions in Cities in a Turbulent Funding Environment: Vulnerable Institutions and Vulnerable Places in England», *Cambridge Journal of Regions, Economy and Society* 7(2): 307–325.
- GUNASEKARA, C. (2006): Reframing the role of universities in the development of regional innovation systems, *The Journal of Technology Transfer*, 31(1), 101–113.
- GUERRERO, M.; CUNNINGHAM, J.A.; URBANO, D. (2015): Economic impact of entrepreneurial universities' activities: An exploratory study of the United Kingdom. *Research Policy*, 44(3): 748–764
- HARRISON, J.; TUROK, I. (2017): Universities, knowledge and regional development, *Regional Studies*, 51, 977–1099.
- HARRISON J.; SMITH, D.P.; KINTON, C. (2016): New institutional geographies of higher education: the rise of transregional university alliances, *Environment and Planning A*, 48, 910–936.
- HARRISON, R.; LEITCH, C. (2010): Voodoo Institution or Entrepreneurial University? Spin-off Companies, the Entrepreneurial System and Regional Development in the UK, *Regional Studies* 44:9, 1241–1262.
- HEFCE/OST (2005): Higher Education Innovation Fund round 3, July 2005/36.
- HEFCE (2011): Decisions on Assessing Research Impact. REF 01.2011. Bristol: Higher Education Funding Council for England.
- (2017): «What is TEF?», 21 June 2017 <http://www.hefce.ac.uk/lt/tef/whatistef/> (accessed 10/07/17).
- HEFCW (2006): Meeting of the council's third mission committee on 21 February 2006 [https://www.hefcw.ac.uk/documents/council\\_and\\_committees/council\\_papers\\_and\\_minutes/2006/Third%20Mission%2006%2012.pdf](https://www.hefcw.ac.uk/documents/council_and_committees/council_papers_and_minutes/2006/Third%20Mission%2006%2012.pdf) (accessed 10/07/17)
- (2013): «HEFCW Research, Innovation and Engagement Committee», [https://www.hefcw.ac.uk/documents/council\\_and\\_committees/committees/RIEC/RIEC%20annual%20report%202012%202013.pdf](https://www.hefcw.ac.uk/documents/council_and_committees/committees/RIEC/RIEC%20annual%20report%202012%202013.pdf) (accessed 10/07/17).
- HEWITT-DUNDAS, N. (2012): Research intensity and knowledge transfer activity in UK universities. *Research Policy*, 41, (2), 262–275.
- HUGGINS, R.; JOHNSTON, A. (2009): The economic and innovation contribution of universities: a regional perspective, *Environment and Planning C: Government and Policy* 6, 1088–1106.
- HUGGINS, R.; JOHNSTON, A.; STEFFENSON, R. (2008): Universities, knowledge networks and regional policy, *Cambridge Journal of Regions, Economy and Society* 1, 321–340.
- HUGGINS, R.; KITAGAWA, F. (2012): «Devolution and Knowledge Transfer from Universities: Perspectives from Devolved Regions in the UK», *Regional Studies*, 46(6) 817–832.
- JAIN, S.; GEORGE, G.; MALTARICH, M. (2009): Academics or entrepreneurs? Investigating role identity modification of university scientists involved in commercialization activity. *Research Policy*, 38(6), 922–935.
- JONES, M.; GOODWIN, M.; JONES, R. (2005): State modernization, devolution and economic governance: an introduction and guide to debate, *Regional Studies* 39, 397–403.
- JONGBLOED, B.; ZOMER, A. (2012): «Valorisation, Knowledge Transfer and IP: Creating Value from Academic Knowledge», in TEMPLE, P. (ED.), *Universities in the Knowledge Economy: Higher Education Organisation and Global Change*, pp. 82–102. London: Routledge.

- KENNEY, M.; GOE, W.R. (2004): The role of embeddedness in professional entrepreneurship: A comparison of electrical engineering and computer science at UC Berkeley and Stanford. *Research Policy*, 33(5): 691-707.
- KITAGAWA, F. (2004): Universities and regional advantage: higher education and innovation policies in English regions. *European Planning Studies* 12(6), 835-852.
- KITAGAWA, F.; LIGHTOWLER, C. (2013): Knowledge Exchange: A comparison of policy, incentives and funding mechanisms in English and Scottish Higher Education. *Research Evaluation* 22(1) 1-14.
- KITAGAWA, F.; SÁNCHEZ-BARRIOLUENGO, M.; UYARRA, E. (2016): Third Mission as Institutional Strategies: Between isomorphic forces and heterogeneous pathways, *Science and Public Policy*. 43(6): 736-750.
- KITAGAWA, F.; OBA, J. (2010): «Managing Differentiation of Higher Education System in Japan: Connecting Excellence and Diversity», *Higher Education*. 59(4) 507-524.
- LAMBERT, R. (2003): Lambert Review of Business–University Collaboration Final Report (December 2003) [http://www.hm-treasury.gov.uk/d/lambert\\_review\\_final\\_450.pdf](http://www.hm-treasury.gov.uk/d/lambert_review_final_450.pdf)
- LAREDO, P. (2007): Revisiting the Third Mission of Universities: Toward a Renewed Categorization of University Activities? *Higher Education Policy* 20, 441-456.
- LAURSEN K.; REICHTEN T.; SALTER, A. (2011): Exploring the effect of geographical proximity and university quality on university-industry collaboration in the United Kingdom, *Regional Studies* 45(4), 507-523.
- LAWTON SMITH, H. (2007): Universities, innovation, and territorial development. *Environment and Planning C* 25, 98-114.
- LEBEAU, Y.; COCHRANE, A. (2015): Rethinking the third mission: UK universities and regional engagement in challenging times, *European Journal of Higher Education*, 5:3, 250-263.
- LYALL, C. (2007): Changing boundaries: the role of policy networks in the multi-level governance of science and innovation in Scotland, *Science and Public Policy* 34, 3-14.
- MARTIN, B.R. (2012): Are universities and university research under threat? Towards an evolutionary model of university speciation. *Camb. J. Econ.* 36(3), 543-565.
- MARTIN, B. (2017): *What's happening to our universities?* *Prometheus*, 34 (1), 7-24.
- MARTIN, R.; PIKE, A.; TYLER, P.; GARDINER, B. (2016): Spatially Rebalancing the UK Economy: Towards a New Policy Model? *Regional Studies*, 50(2) 342-357.
- MCCANN, P. (2016): *The UK Regional-National economic problem: geography, globalisation and governance*, Regional Studies Association. Routledge.
- MOLAS-GALLART, J.; CASTO-MARTINEZ, E. (2007): «Ambiguity and Conflict in the Development of ‘Third Mission’ Indicators», *Research Evaluation*, 16, 321-30.
- MORGAN, K.; NAUWELAERS, C. (EDS) (2002): *Regional Innovation Strategies: The Challenge for Less-favoured Regions*. London: Routledge.
- OECD (2007): Higher education and regions: globally competitive, regionally engaged, Paris, OECD/ IMHE.
- MUELLER, C.; WESTHEAD, P.; WRIGHT, M. (2012): Formal venture capital acquisition: can entrepreneurs compensate for the spatial proximity benefits of South East England and star’ golden-triangle universities? *Environment and Planning A*, 44:281-296.
- NEDEVA, M.; BODEN, R. (2006): Changing science: the advent of neo-liberalism, *Prometheus*, 24, 3, 269-281.
- PACEC (2012): *Strengthening the Contribution of English Higher Education Institutions to the Innovation System: knowledge exchange and HEIF funding. A report for HEFCE*. <http://www.hefce.ac.uk/media/hefce/content/what-wedo/knowledgeexchangeandskills/heif/pacec-report.pdf> accessed 20July2012
- PERRY B.; MAY T. (2007): Governance, science policy and regions: an introduction, *Regional Studies* 41, 1039-1050.
- PINHEIRO, R.; BENNEWORTH, P.; JONES, A. (EDS) (2012): *Universities and Regional Development: A Critical Assessment of Tensions and Contradictions*. Abingdon: Routledge.
- PIKE, A.; MARLOW, D.; MCCARTHY, A.; O'BRIEN, P.; TOMANEY, J. (2015): «Local institutions and local economic development: the Local Enterprise Partnerships in England», *Cambridge Journal of Regions, Economy and Society*, 8, 184-204.
- POWER, D.; MALMBERG, A. (2008): The contribution of universities to innovation and economic development: in what sense a regional

- problem? *Cambridge Journal of Regions, Economy and Society*, 1: 233-245.
- PINTO, H.; FERNÁNDEZ-ESQUINAS, M.; UYARRA, E. (2015): Universities and Knowledge-Intensive Business Services (KIBS) as Sources of Knowledge for Innovative Firms in Peripheral Regions. *Regional Studies*, 49(11), 1873-1891.
- PUGH, R. (2017): Universities and economic development in lagging regions: 'triple helix' policy in Wales, *Regional Studies*, 51(7), 982-993.
- ROSLI, A.; ROSSI, F. (2016): Third mission policy goals and incentives for performance-based funding: are they aligned? *Research Evaluation*, pp. 1-15.
- SAINSBURY, L. (2007): *The Race to the Top—a review of government's science and innovation policies*. Her Majesty's Stationary Office, London.
- SÁNCHEZ-BARRIOLUENGO, M. (2014): Articulating the 'three missions' in Spanish universities. *Research Policy*, 43(10), 1760-1773.
- SÁNCHEZ-BARRIOLUENGO, M.; UYARRA, E.; KITAGAWA, F. (2016): The Evolution of Triple Helix Dynamics. The Case of English Higher Education, CIMR Research Working Paper <http://www.bbk.ac.uk/innovation/publications/docs/WP32.pdf> (accessed 10/12/16).
- SCOTT, P. (2014): The reform of English higher education: universities in global, national and regional contexts. *Cambridge Journal of Regions, Economy and Society*. 7 (2): 217-231.
- (2017): Brexit and higher education <http://www.ucl.ac.uk/european-institute/analysis/2016-17/brexit-higher-education> (accessed 10/07/17).
- SCOTTISH FUNDING COUNCIL (SFC) (2007): Knowledge Exchange on Public Policy. Autumn, Issue 1.
- SHATTOCK, M. (1997): The managerial implications of the new priorities, *Higher Education Management*, 9 (2) 27-34.
- SENGUPTA, A.; RAY, A. (2017): University research and knowledge transfer: A dynamic view of ambidexterity in British universities *Research Policy* 46, 881-897.
- SLAUGHTER, S.; RHOADES, G. (1996): «The Emergence of a Competitiveness Research and Development Policy Coalition and the Commercialization of Academic Science and Technology», *Science Technology & Human Values*, 21: 303-39.
- UNIVERSITIES UK (2008): *Devolution and Higher Education: Impact and Future Trends*. London: Universities UK.
- (2017): Universities UK response to 'building our industrial strategy: green paper, January 2017' <http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2017/uuk-response-industrial-strategy-green-paper.pdf> (accessed 10/07/17)
- UPTON, S.; GODDARD, J.; VALLENCE, P. (2014): From outcomes to processes: evidence for a new approach to research impact assessment, *Research Evaluation* 23(4) 352-365.
- UYARRA, E. (2010): Conceptualizing the Regional Roles of Universities, Implications and Contradictions. *European Planning Studies*, 18(8), 1227-1246.
- UYARRA, E.; FLANAGAN, K. (2010): From Regional Systems of Innovation to Regions as Innovation Policy Spaces, *Environment and Planning C: Government and Policy*, 28/4: 681-95.
- VORLEY, T.; NELLS, J. (2008): «(Re)conceptualising the Third Mission: Entrepreneurial Architecture of Higher Education Institutions», *Policy Futures in Education*, 7: 284-96.
- WARREN, L.; KITAGAWA, F.; EATOUGH, M. (2009): Developing the knowledge economy through university linkages: An exploration of RDA strategies through case studies of two English regions, *International Journal of Entrepreneurship and Innovation* 11.
- WELSH ASSEMBLY GOVERNMENT (WAG) (2002): Wales for Innovation: The Welsh Assembly Government's Action Plan for Innovation. WAG, Cardiff.
- WILSON, T. (2012): Review of Business–University Collaboration, *The Wilson Review*, <http://www.wilsonreview.co.uk/>
- WITTY, A. (2013): Encouraging a British Innovation Revolution. Sir Andrew Witty's Review of Universities and Growth. <https://www.gov.uk/government/publications/universities-and-growth-the-witty-review>
- ZHANG, Q.; MACKENZIE, N.; JONES-EVANS, D.; HUGGINS, R. (2016): Leveraging knowledge as a competitive asset? The intensity, performance and structure of entrepreneurial universities and their regional knowledge networks. *Small Business Economics*. 47: 657-675.