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Institutional work in the maintenance of regional innovation policy instruments:

Evidence from Wales

Dylan Henderson

Introduction

In recent decades, research on innovation and the role of policy in helping regions to develop their economies has come to the fore. While this has highlighted the systematic nature of innovation systems (Asheim & Gertler, 2009; Cooke, 2008), relatively little attention has been given to the regional innovation policy process itself (Flanagan & Uyarra, 2016; Flanagan et al., 2011). In contributing to this debate, research has identified entrepreneurial actors at the heart of launching new ideas on the policy agenda (Edler & James, 2015; Kingdon, 1984/2003), as well as shaping new economic and innovation activities within institutionalised settings (Carvalho & Vale, 2018; Sotarauta & Mustikkamäki, 2015). Such studies have shown how different levels of governance, and the broad nature of the community of institutional actors (government, firms, universities), come together to coordinate and shape regional innovation (Aranguren et al., 2019; Magro & Wilson, 2013).

This paper seeks to challenge the emphasis on entrepreneurial actors in the regional innovation literature, by arguing that such agents are part of a much wider range of agency

practices in regional innovation policy making. It does so by drawing on the concept of institutional work (Lawrence & Suddaby, 2006; Lawrence et al., 2009; Lawrence et al., 2011), and the activities of actors in maintaining institutional arrangements over time (Lok & De Rond, 2013; Micelotta & Washington, 2013). Here, the concept of institutional work suggests that while policy maintenance has institutional foundations, its persistence over time is far from certain. Indeed, by emphasising entrepreneurial activity, regional innovation research underplays the everyday practices that lead to durability of policies over time.

By focusing on the maintenance of policies the paper seeks to highlight the role of agency in sustaining regional innovation policy instruments over time, but also its interplay with the wider structural context (Battilana et al., 2009). It explores these ideas through a case-study of regional innovation policy instruments in Wales over a ten-year period. The paper begins by reviewing the literature on agency and institutions in regional innovation policy, and introduces the concept of institutional work and policy maintenance. The following sections outline the methodological approach, the research case and case study results. The discussion and conclusions address the research questions and identify maintenance as a process of strategic care undertaken by a community of actors working towards the sustenance of regional innovation policy.

Regional innovation, policy and the role of maintenance agency

A growing number of regional innovation theorists have begun to respond to the challenge of better understanding the role of agency and institutions in the development process (Morgan, 2016; Sotarauta & Pulkkinen, 2011; Uyarra et al., 2017). Such work has highlighted the complexity of policy at the regional level, where it is characterised by multi-level

governance, overlapping responsibilities and associated tensions (Flanagan & Uyarra, 2016; Flanagan et al., 2011), and coordination challenges (Valdaliso et al., 2014). This body of work calls for a more dynamic interpretation of regional innovation policy, with a greater focus on policy making processes (Uyarra et al., 2017; Valdaliso et al., 2014) and the role of policy entrepreneurship (Flanagan & Uyarra, 2016; Kingdon, 1984/2003).

Attention to the role of actors and agency has similarly emerged in the regional innovation literature (Feldman & Francis, 2006; Grillitsch, 2018; Morgan, 2016; Smith, 2018), where researchers have highlighted entrepreneurship and agency at the heart of creating new regional pathways (Carvalho & Vale, 2018; Grillitsch, 2018; Simmie, 2012). This body of work has introduced the potential for actors to contribute towards regional innovation by creating completely new, or related industrial pathways of development (Martin, 2010; Martin & Sunley, 2006). It also identified the challenge for actors to step outside of the constraints of the system which they inhabit, and to take new forms of action (Sotarauta & Pulkkinen, 2011).

In parallel to the growth of actor-based studies of regional innovation, the mainstream institutional literature has increasingly challenged the concept of institutional entrepreneurship for treating actors as homogenous, rational and elite heroes (Hardy & Maguire, 2017). Indeed, as Lawrence et al. (2009: 1) argue, there is a need for: *'a broader vision of agency in relation to institutions, one that avoids depicting actors either as "cultural dopes" trapped by institutional arrangements, or as hypermuscular institutional entrepreneurs.'* Policies have been identified as having institutional foundations that constrain change and promote durability of policy action (Kay, 2005; Pierson, 2000; Pierson, 2006). Pierson (2004), for example, suggests that political institutions are inherently rigid,

with a tendency towards ‘status quo bias’, and that policies will often be designed to ensure they cannot be overturned by successors. This rigidity is said to reflect the collective nature of political activity, and the complexity of policy processes that work to reinforce existing political institutions (Pierson, 2004).

The concept of institutional work provides a lens to view regional actors and agency in the persistence of regional innovation policy over time. Developed by institutional theorists (Lawrence & Suddaby, 2006; Lawrence et al., 2009), it is defined as *‘purposive action towards the development, maintenance and disruption of institutional routines’* (Lawrence & Suddaby, 2006: 215). The concept sees a recursive relationship between institutions and agency, in which institutions provide a framework that shapes, but can be shaped by the work of actors (Jepperson, 1991; Lawrence et al., 2009). Such work is characterised as a collective endeavour based on reflexivity, skill and awareness and patience (Heaphy, 2013; Lawrence et al., 2009).

Institutional maintenance has been identified as a form of institutional work, with a focus on *‘supporting, repairing or recreating the social mechanisms that ensure compliance’* (Lawrence & Suddaby, 2006: 230). While maintenance has been largely overlooked in the institutional literature (Scott, 2014), empirical studies have begun to emerge, revealing a range of maintenance practices:

- Enabling – creation of rules in support of institutions, for example the authorisation of agents or roles to carry out institutional routines to support their persistence. Such authority can be multi-level in practice, with distributed roles and responsibilities operating at the regional level. Such enabling action is described in the work of Guler

et al. (2002) in the creation and diffusion of the international ISO 9000 standard, underpinned by a range of authorised testing and compliance agents. .

- Policing and deterrence – monitoring compliance in relation to rules and sanctioning non-compliance. Such monitoring can incorporate penalties for noncompliance, as well as incentives. By establishing barriers to change, deterrence practices can help to support policing by instilling compliance. Micelotta and Washington (2013) illustrate such practices in the response of professional service associations to disruptive changes in the face of government pressure for liberalisation. Such work, they find, relies on reasserting norms, rebalancing institutional power, and regaining institution leadership.
- Normative – in contrast to more formal rules and sanctions, such practices can include the promotion of positive and negative examples, mythologizing. The focus of such actions is one of embedding and supporting the routinisation of practices. Zilber (2009), for example, highlights the role of stories in the creation of narratives in support of institutional maintenance. Lok & De Rond (2013) emphasise the plasticity of institutional scripts in making good disruptions to exiting routines and practices.

Adapted from Lawrence & Suddaby (2006):

These practices can be coercive, encouraging adherence to rules (for example, through the creation of rules, monitoring and sanctions), as well as activities to reproduce norms and beliefs through evidence, and routinizing activities (Lawrence & Suddaby, 2006). They may involve considerable effort to address challenges from within or outside an organisation (Lok & De Rond, 2013), and making good disruptions to exiting routines and practices. Such maintenance practices may involve varying degrees of agency consciousness, including habit (action based on thoughts and action from the past), practical evaluation (related to present day assessment) and imagination (based on envisaged future trajectories) (Battilana &

D'aunmo, 2009; Emirbayer & Mische, 1998). In this respect, maintenance work may involve consideration and identification of past, present and future disruptive challenges, as well as mitigating arrangements (Hargrave & Van De Ven, 2009). Such notions open the possibility that different forms of agency and interaction are possible within maintenance work (Lawrence et al., 2013).

Drawing attention to the role of agency in developing and maintaining institutional arrangements introduces strategy to the processes of institutionalisation (Dimaggio, 1988). Regional innovation systems (Asheim et al., 2016; Cooke, 2008), however, are characterised by rich multi-dimensional policy interactions (Magro et al., 2014; Matti et al., 2016). This suggests that maintenance work may transcend boundaries and positions within a regional innovation policy community, and be shaped by spatial as well as social processes. Adopting a greater focus on maintenance alongside, or in conflict with entrepreneurial actors has the potential to widen the lens through which regional innovation scholars examine policies and new path development.

To unpack the role of institutional maintenance work in regional innovation policies the paper seeks to answer three research questions. First, which actor roles are involved in innovation policy maintenance at the regional level? Second, what practices do these actors follow in seeking to maintain the policy instruments over time? And third what outcomes result from such practices?

Research method

The paper adopts a case study approach to the role of actors and agency in the maintenance of regional innovation policy over time. This approach provides a method to understand the complex processes associated with agency activity in multi-dimensional policy communities, but also to understand the structural factors and embedded nature of these processes. It follows a single case-study design (Yin, 1994), using evidence from actors and regional policy in Wales. This focuses on the innovation and technology policy instruments established by the Welsh Government between 2008 and 2018.

The case study research comprised some 21 interviews with actors from the government, business and university sector, including Wales and UK actors (See Supplementary material). These interviewees were selected to include current and former participants in the innovation policy community. The sample was identified through a process of snowballing and documentary research. All interviews were approximately one hour in length, with recordings made for all interviews where possible. With a large element of the case study's focus on public service actors, and the sometimes hidden processes of strategy, care was needed to encourage participation in the research (Renzetti & Lee, 1993). To account for possible sensitivities, full anonymity was offered to the interviewees. This interview data was coded and analysed with the aid of NVivo qualitative analysis software, and supported by documentary and news article (Nexis[®]) analysis.

The research case - Wales

Wales is a devolved region in the UK, with a long history of seeking to develop a new regional economic pathway through innovation and other forms of policy intervention. It was one of the first wave of regions to develop a Regional Innovation Strategy in the mid-1990s, with the support of the European Commission (Henderson, 2000; Morgan, 1997). This exercise helped to bring concepts such as ‘innovation systems’ to the attention of policy makers in Wales, and encouraged broad based support for policy intervention amongst business and universities as a way of addressing the significant economic challenges faced by the region (See Welsh Government, 2014). Indeed, by 2008, innovation policy in Wales had endured for more than 20 years (Henderson, 2019).

As a sub-national territorial entity, Wales is characterised by a rich multi-actor, multi-level policy environment. In the period of the study, the Welsh Government was the principle organisation with responsibility for innovation policy in Wales. Between 2008 and 2018, this included three main policy statements that either focused on innovation, or incorporated it into its priorities: the Economic Renewal Plan (Welsh Assembly Government, 2010), Innovation Wales – the smart specialisation strategy (Welsh Government, 2014) and the Economic Action Plan (Welsh Government, 2018). These policies highlighted the economic challenges faced by Wales, with its low levels of economic productivity (Gross Value Added was 73% of the UK average in 2016ⁱ), and comparatively low R&D activity (Gross R&D expenditure was 2.2% of the UK total in 2016ⁱⁱ - much lower than its population share of 5%). The broad focus of these policy statements was to support business R&D and innovation, encourage universities to promote knowledge transfer, provide support for priority areas of the economy (Pugh, 2014), as well as securing funding from outside sources.

The focus of this paper is Welsh Government's innovation policy instruments, including financial support for commercialisation and capacity building, business R&D, and innovation advisory services for SMEs (Table 1).

Table 1. Welsh Government innovation policy instruments 2008-2018

<p><i>1. HE commercialisation and capacity building funding</i></p> <p><i>2. Business commercialisation funding</i></p> <p><i>3. Business innovation advice</i></p>	<p>Academic Expertise for Business (A4B) Academic-industry grant funding for knowledge transfer and knowledge exploitation, including: - Knowledge Exploitation Capacity Funding - Collaborative Industrial Research projects</p> <p>Smart Cymru Business RD&I Business grant funding for RD&I project, including support for: - Development of Concept - Technical and Commercial Feasibility - Industrial Research - Experimental Development - Exploitation</p> <p>Business Innovation Programme Specialist advisor network for innovative Businesses, including support for: - New product development - Intellectual property and commercialisation - Design support - Manufacturing support.</p>	<p>Smart Expertise Academic-industry grant funding for knowledge transfer and knowledge exploitation, including: - Smart Partnership projects</p> <p>Smart Cymru Business grant funding for RD&I project, including: - Technical and Commercial Feasibility - Industrial Research - Experimental Development - Exploitation - Open Innovation</p> <p>Smart Innovation Specialist advisor network for innovative businesses, including support for: - New product development - Access to funding - Manufacturing technology and process improvement - Design support - Intellectual property protection and exploitation</p>
Period of operation	2008-2015	2015-2020
Regional coverage	Pan-Wales	Pan-Wales
Funding	ERDF, Welsh Government, private sector	ERDF, Welsh Government, private sector, university
Budgets	A4B (£53m), Smart Cymru (£27m), Business Innovation (£30m) = £110m in total (€125m)	Smart Expertise (£51m), Smart Cymru (£63m), Smart Innovation (£20m) = £134m (€150m)

Sources: Welsh Government (2016), CM International and The Innovation Partnership (2015), The Innovation Partnership and CM International (2015)

Results

Actors, agency and maintenance practices

In the 2008-2018 period Welsh Government support for innovation included three groups of instruments noted in Table 1, accounting for the majority of funding allocated to innovation in the region (Interview 1). This funding was administered by officials within its Economy, Skills and Natural Resources department, and targeted at Welsh businesses and universities, both of whom had also sought to use European Structural and Investment Funds (ESIF) to support regional innovation. The Welsh European Funding Office (WEFO), part of Welsh Government, acted as Managing Authority for EU funding for all such instruments in Wales³, with responsibility for developing Operational Programmes. Other institutional actors included the Innovation Advisory Council for Wales (IACW), comprising representatives of business, universities and government agencies. This body was responsible for advising Welsh Government Ministers on innovation matters, including monitoring progress. Such arrangements reflect the comparatively strong role of the public sector often found in old industrial regions such as Wales (Dawley, 2014; Morgan, 2013).

At the heart of actor maintenance activities were Welsh Government officials' efforts to sustain funding for innovation and technology policy instrumentation. This desire was reflected in ongoing concerns about the Welsh Government's prioritisation of funding for innovation, relative to that of wider business support: '*...innovation [policy] suffers from the fact we aren't able to show the phenomenal level of jobs that other [business support] programmes can⁴, we are about the much longer term*' (Interview 2). Such concerns had been heightened by the Welsh Government's move, in 2010, to make all finance for business

repayable. The impetus from this decision came with the development of the Economic Renewal Plan (Welsh Assembly Government, 2010), combined with the growing concerns about grant dependency by groups such as business representative organisations (FSB Wales, No date; House of Commons Welsh Affairs Select Committee, 2009). This was identified by the then Deputy First Minister Ieuan Wyn Jones, who noted that *'The massive grant culture is over in Wales'* (Servini, 2009). While these moves were not ultimately implemented (Davies, 2017), officials' limited ability to influence such decisions (taken by higher level civil servants within the Welsh Government), and the gradual reduction of funding for innovation from the mid-2000s led to maintenance of policy becoming an important priority (Interviews 2 and 3). As one senior official put it: *'... We had to work much harder to persuade senior (Welsh Government) staff that innovation was a vital cross-cutting theme. They just didn't get it in many cases, really, and as a consequence we lost a lot of impetus'* (Interview 3). The role of politicians in this institutional context was also evident in the reported frustrations of Ministers to bring about policy changes. As one senior business interviewee put it: *'In defence of the politicians most want to get stuff done, and a Minister will never admit it but a lot of Ministers I know, behind closed doors, will tell me how frustrated they are with their inability to get things done'* (Interview 4).

Amongst the practices employed by the officials were efforts to influence the policy narrative around innovation policy instruments in Wales. As one Welsh Government official noted (Interview 3): *'We were very good at it...ensuring we always drafted chapters for strategy documents, and ensuring that good evidence of project impacts was available for briefings...to policy makers and politicians.'* This, however, was not always without challenge, with innovation claimed to be an afterthought in some strategic statements (Interview 2). Maintenance activities included the procurement and production of evidence

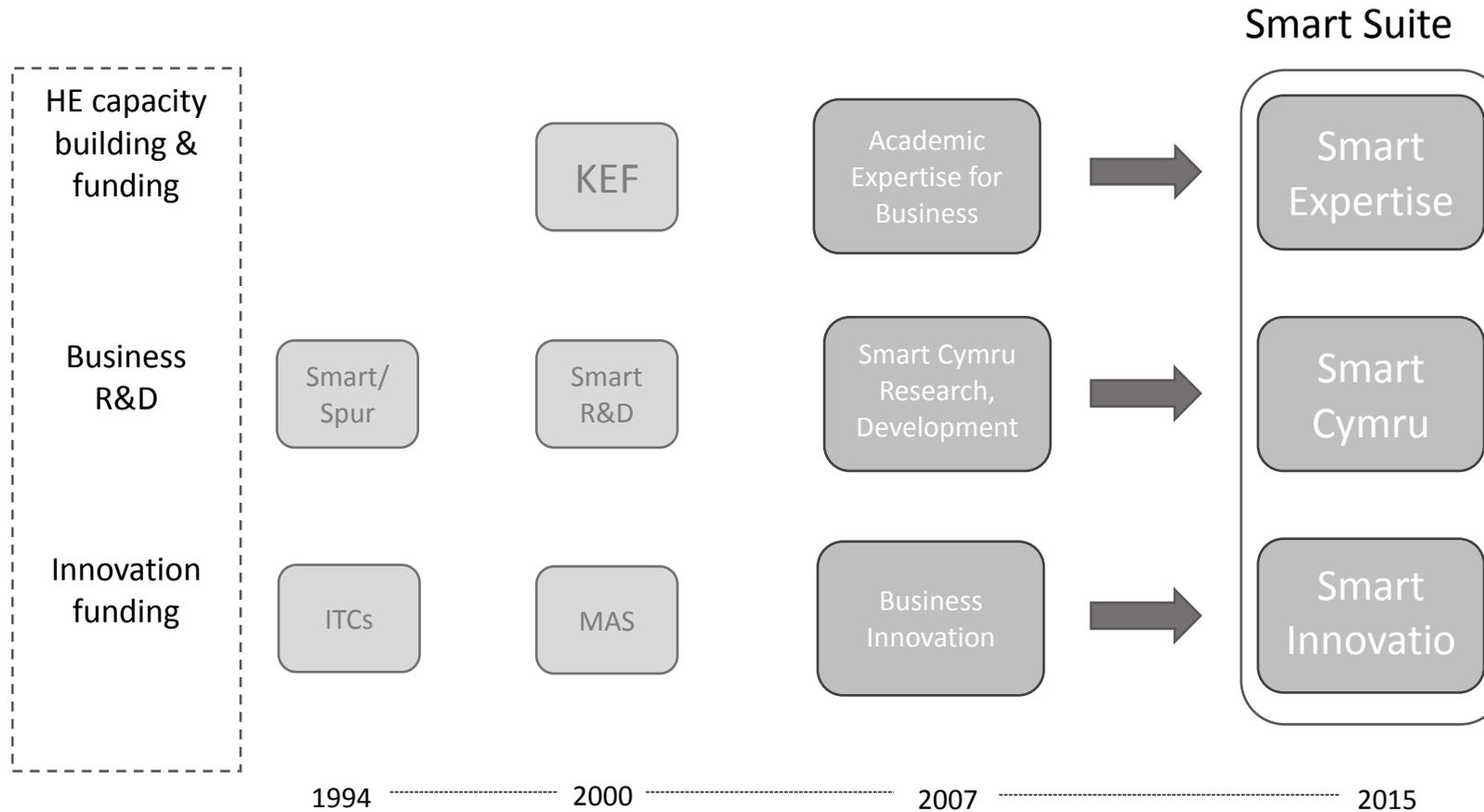
(studies and surveys) for senior civil servants and politicians, as well as other materials collected directly from projects, to enable officials to make a strong case for activities and their impacts on different sectors and parts of Wales. Such influence on the narrative was supplemented by wider promotion and dissemination of successful cases of new products / processes in publications such as the longstanding ‘Advances Wales’ magazine⁵ (Interview 5).

Welsh Government officials also sought to monitor the innovation policy agenda in Wales/UK and Europe (Interview 5), with a view to identifying emerging trends and policy practices from other regions (See Cardiff University / Nesta, 2015). This work further supported the narrative around innovation policy instruments in Wales, and was evident in the way that policy officials took part in the Operational Programme⁶ development processes to ensure that their ‘*voices were heard*’ (Interview 5). This was an approach that had been successfully utilised over a number of years by officials (Interview 3).

The success of Welsh Government officials in securing such funding, however, also resulted in the need to follow external parties’ funding requirements (Interview 5, 6, 9). This included EU regulations (applied by WEFO) for funding the ‘cross-cutting themes’ of environmental sustainability, equal opportunity and gender mainstreaming (See Parker et al., 2015), (Interview 2). While such additions were not always felt to be directly relevant to the Smart instruments: ‘*with the best will in the world we’re funding technical projects – our businesses just don’t see the relevance of the themes*’ (Interview 9), they were eventually embraced (See Innovation Advisory Council for Wales, 2018) as a way of adapting the instruments to ensure continued availability (Interview 2).

Further efforts to maintain the instruments through adaptation were evident in officials' response to WEFO's request for larger, more strategic instruments in the 2007-2014 ESIF period (Interview 4). This saw them bring together previously separate instruments, including some formerly delivered by other organisations – see Figure 1. Such moves presented management challenges for Welsh Government, given the size and the complexity of stakeholder engagement (Interview 5), but were perceived to be necessary to sustain and maintain availability of funding for innovation in Wales: *'We wouldn't have been allowed to continue as separate projects. WEFO were looking for much larger, more strategic projects to minimise the massive administration burden associated with all the projects they'd funded in the previous structural funds round'* (Interview 2). In this respect bundling represented a response to the need to defend Welsh Government's engagement in the delivery of innovation and technology instruments.

Figure 1. Bundling Welsh Government innovation and technology instruments, and their antecedents



Sources: Welsh Development Agency (1996) [Smart/Spur], Welsh Development Agency (1999) [ITCs – Innovation and Technology Counsellors]; Welsh Assembly Government (2004) [KEF – Knowledge Exploitation Fund], Byard et al. (2012) [MAS – Manufacturing Advisory Service Wales], CM International & The Innovation Partnership (2014) [A4B – Academic Expertise for Business], CM International & The Innovation Partnership (2016) [Smart Cymru], The Innovation Partnership (2015) [Business Innovation], Welsh Government (2016) [Smart Suite].

Alongside the policy maintenance work of Welsh Government officials, a broader coalition of regional actors provided maintenance assistance. Business representative bodies, for example, were active in helping to raise the importance and availability of innovation support to their members, with small business bodies such as FSB Wales also calling for the traditional R&D and technology focused instruments to take more account of the needs of SMEs (Francis, 2018). As one interviewee argued:

‘...we need tech driven innovation, we absolutely need research and product driven innovation, so there's no doubt about that... but it is not an either or question [to support large companies or SMEs]’ (Interview 10).

Policy and evaluation consultants, both inside and outside Wales, shared the belief that innovation was important to the Welsh economy and its future prosperity (Interviews 10 and 11), and had built up good relationships with officials: *‘the guys know us, they know we understand the programme and what they are trying to achieve...not stab them in the back’* (Interview 11). In this respect consultants saw their role as both independent, and one that recognised the challenges of delivering such instruments in a turbulent institutional period of change brought about by the introduction of repayable finance (See CM International & The Innovation Partnership, 2016: 8). Like business representative bodies, however, they also shared a dual interest in both sustaining, but also renewing innovation policy instruments to modernise their content – which derived from their commercial focus (Interview 10).

The importance of ensuring the continuation of innovation policy instruments was shared by other actors in receipt of ESIF support. Universities, for example, represented significant beneficiaries of such funding (Jones-Evans & Bristow, 2010), and had similar interest in

continuing access to the policy instruments (Interview 5). This included implicit support, via the continued use of the Welsh Government and related policy instruments, but also in lobbying officials and Ministers to ensure continued access (Interviews 2, and 3): *'the universities have become accustomed to A4B and the like...all hell would break loose if it was made more difficult, or funding was reduced'* (Interview 5). Such concerns were further emphasised in the latter period, with calls made for additional funding to ensure comparability with England's Higher Education Innovation Funding in the post-Brexit period (See Reid, 2018).

Elsewhere, Welsh Government officials sought to build stronger relationships with external bodies, including the EU and UK government, in order to take advantage of such funding (Interviews 2, 3, 13). For much of the period, however, Innovate UK⁷ followed a competition-based logic in which funding was allocated to the 'best' UK projects, and had limited presence in the region (Jones-Evans, 2015) . This placed Wales, as a low R&D expenditure region, at a disadvantage against stronger UK regions in accessing UK funding sources⁸.

Maintenance effects

While the preceding section highlights the role of actors and agency in the maintenance of innovation policy instruments in Wales, it also hints at the mediating effects of structural factors. In this respect regulatory aspects were relevant to the persistence of Welsh Government funding instruments. In providing financial aid to businesses in the region the funding instruments fell within the rules of the EU's State Aid frameworks for research, development and innovation (Interview 8, European Commission, 2006, 2014). These set out

competition rules for defined areas of public financial assistance including R&D projects, innovation activities and cluster activities, construction research infrastructure and feasibility studies, as well as their ‘aid intensities’⁹ (European Commission, 2014: 7). Over the 2008-2018 period the largely consistent nature of these regulations for public financial assistance for R&D was such that Welsh Government officials were able to justify maintenance of the instruments (Interview 9). The State Aid rules, while comprehensive, did not mandate regions to develop funding to meet all type of aid possibilities. Indeed, Wales’ future arrangements for such instruments outside of the EU context opens the potential for new arrangements to be considered.

When viewed over a ten-year period the interplay between structure and agency both constrained the Welsh Government innovation and technology policy instruments, and enabled them to become ossified into three main programme areas (see Figure 1). Such instruments became established as the primary source of funding and advice, to the extent that: *‘WEFO has encouraged us to use the Smart Suite to act as the gateway for all businesses in Wales looking for innovation funding’* (Interview 1). This has seen the instruments embedded in strategic statements in support of innovation policy (See Welsh Government, 2014), and refreshed in the most recent ESIF Funding period (The Innovation Partnership, 2015).

The outcome of maintenance can be seen in findings of successive evaluations, that have provided evidence of job creation and Gross Value Added results (CM International & The Innovation Partnership, 2014, 2016; The Innovation Partnership, 2015). Indeed, the final evaluation of the Smart Cymru programme (2009-2015) concluded that *‘The return on investment produced by the programme compares favourably [with] the other similar*

schemes across the UK' (CM International & The Innovation Partnership, 2016: 76).

Ongoing pressure to justify Welsh Government's support of innovation policy has, however, been reflected in concerns about grant dependency (Interview 11). Looking forward, Brexit represents a great source of uncertainty for policy actors in Welsh Government and beyond, given the importance of ESIF funding for innovation and technology instruments in Wales. While this research does not seek to explore the full extent of Welsh Government planning for a post-Brexit future, the results show evidence of actors seeking to sustain innovation policy instruments (See Reid, 2018), but also consider new approaches, thus highlighting the integration of different types of institutional work.

Analysis and conclusions

This paper aims to contribute towards the increasing attention given to the role of actors, agency and institutions in shaping policies for regional innovation (Flanagan et al., 2011; Magro et al., 2014; Uyarra et al., 2017). It does so by drawing on the concept of institutional work, and examines the role of actors in helping to maintain and ensure the persistence of policy instruments over time (Lawrence & Suddaby, 2006; Lawrence et al., 2009; Lawrence et al., 2011). While entrepreneurial agency has become an emerging agenda for regional innovation studies in recent years (Grillitsch, 2018; Sotarauta & Mustikkamäki, 2015), the findings point to a wider range of agency practices in ensuring maintenance and support for existing institutional arrangements for innovation policy.

The findings show how the persistence of regional innovation policy over time is characterised by maintenance work undertaken by a broad community of actors at the regional level. While the participation of a diverse community of actors has been found in

previous research on regional innovation (See Uyarra et al., 2017), the results suggest that government actors are central to this process, based on their privileged access to, and understanding of, the policy process. These actors, and that of the broader supporting community, are characterised by a shared belief in the importance of innovation to the regional economy, with these beliefs nurtured by interactions and relationships built over time. Their knowledge, and role in implementing complex rules and regulations associated with innovation funding sources such as ESIF¹⁰, further places them at an advantage in securing and maintaining such support. In this respect the findings highlight both the territorial nature of these activities, but also the social basis of institutional maintenance in actors working together within government, and outside, to ensure policy persistence. This maintenance further benefits from the relatively small number of actors involved in regional innovation policy and evaluation, and the ease by which interaction is enabled at the regional level.

The paper contributes to existing accounts of regional innovation that highlight the role of institutions and agency in supporting new developments (Sotarauta & Mustikkamäki, 2015; Sotarauta & Pulkkinen, 2011), by drawing attention to the presence of actors and agency that may seek to resist, rather than support novel activities. It shows maintenance to be a nuanced concept, comprising multiple practices focused on preventing the breakdown of policy arrangements. Such practices contrast with the repair-based accounts found in much of the institutional maintenance literature (Heaphy, 2013; Micelotta & Washington, 2013). In preventing breakdown two main practices were found – *normative and deterrent*. Normative practices were found to rely on actors generating a positive narrative about the importance of innovation in regional path development, including contributing evidence and disseminating results of the policy instruments and their effects. These practices emphasise historical results

(e.g. evaluation results), but also its prospective capacity to bring about new path development (Emirbayer & Mische, 1998). The case evidence shows how actors employed deterrence as a strategy, using instrumental practices such as bundling and small scale adaptations to respond to challenges and ensuring continued availability of instruments.

In line with existing accounts of agency in regional innovation processes (Grillitsch & Sotarauta, 2018; Sotarauta & Mustikkamäki, 2015), the findings highlight the interplay between maintenance work and structural factors. The case shows that regional agency is mediated by structural factors that build up over time, and help to provide an overarching ossification to policy at the regional level, not least through generating a settled policy narrative in support of funding for innovation policy that has emerged across Europe over the past 30 years (Edler & Fagerberg, 2017; Morgan, 2016), but also through more coercive mechanisms which may be set far from the region itself (such as EU State Aid regulations). Adopting the concept of institutional work, however, highlights how actor practices, while shaped by these structures, can also seek to make use of them for their own ends, and ensure durability of regional policies over time.

Highlighting the ability of regional actors to engage in maintenance activities for regional innovation policy, raises the question of whether policy maintenance activity and innovation/novelty represent a paradox. Or put another way, can persistence be seen as the antithesis of innovation? The findings show, however, that maintenance also involves agency practices for adaptation and change over time. This was evident in the way that regional innovation actors sought to respond to external challenges and requirements of funders. Such responses point to an element of flexibility in actor maintenance practices (for example, bundling of instruments) and their role in helping to sustain activities over time. The findings,

however, highlight the incremental nature of these adaptations (e.g. to cross-cutting themes), and their principal focus on ensuring the continued availability of existing innovation and technology instruments, and limiting the potential for these arrangements to breakdown.

The results of actor maintenance practices are found to have helped embed the policy instruments in Welsh Government's policy routines, and prevent their breakdown. The findings caution, however, against actors being viewed as 'heroic' or 'hyper muscular' (cf. Lawrence & Suddaby, 2006). Indeed, they highlight a more complex picture, with the mixed effects from innovation policy maintenance in Wales, mediated by structural factors (for example, repayable finance, State Aid, Brexit). This points to the limits of agency intervention in regional innovation, and hints at the need for this literature to give greater attention to agency roles that may not always achieve goals

While the findings point to evidence of businesses and universities accessing and benefitting from innovation funding over time (See CM International & The Innovation Partnership, 2014), they also suggest dangers of maintenance, not least in policy and path dependence (Grabher, 1993; Kay, 2006), but also monopolising funding. In this respect, the findings of the research point to the importance of everyday processes of tending practices related to the instruments. Here, the results show that maintenance does not necessarily require actors to step outside of their institutional setting (Sotarauta & Pulkkinen, 2011). Indeed, much of the activity identified in the case study forms part of the everyday management practices for instruments and the requirements of funding parties. Officials' belief in the importance of instruments and their consequent desire to maintain them, however, suggests that maintenance is, in part, a conscious and purposive activity.

Although the findings highlight the presence of adaptive practices within the maintenance of policies, the regional innovation system is far more than the sum of its constituent elements (Martin, 2010). More research is therefore needed to understand whether maintenance activity, across a regional innovation system (for example within its industries), can constrain novelty and the ability of regions to bring about path development and branching (Coenen et al., 2015; Hassink et al., 2019; Morgan, 2016). Indeed, these findings raise the potential for maintenance activity to be viewed as part of a wider range of agency practices, some of which may be competing, in supporting different path development outcomes. The findings also have potential implications for regional innovation policy concepts such as Smart Specialisation and the entrepreneurial discovery process (Aranguren et al., 2019; Morgan, 2016), based on actors engaging in bottom up discovery of new opportunities. This paper's findings suggest that a range of agency practices may be present in such processes, and that closer attention may be needed to understand their interaction with entrepreneurial agency and its effects.

Finally, like previous studies of institutional maintenance (Heaphy, 2013; Lok & De Rond, 2013; Micelotta & Washington, 2013), the findings draw from a single case. To take this research agenda forward not only requires a wider appreciation of agency in regional innovation policy, beyond entrepreneurialism, it also calls for more comparative studies to examine how different contexts shape maintenance activities. Studying actor maintenance, and indeed entrepreneurial and disruptive activities in other regions, will better help to understand the interplay between structure and different agency practices in regions at different stages of development, and with different governance arrangements.

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References

- Aranguren M. J., Magro E., Navarro M. & Wilson J. R. (2019) Governance of the territorial entrepreneurial discovery process: Looking under the bonnet of RIS3, *Regional Studies*, 53(4), 451-461. doi: 10.1080/00343404.2018.1462484
- Asheim B. T. & Gertler M. S. (2009) *The geography of innovation: Regional innovation systems*. Oxford University Press.
- Asheim B. T., Grillitsch M. & Trippel M. (2016) Regional innovation systems: Past–present–future, in Shearmu R., Carrincazeaux C. & Doloreux D. (Eds) *Handbook on the geographies of innovation*, pp. 45-62. Edward Elgar, Cheltenham.
- Battilana J. & D'auomo T. (2009) Institutional work and the paradox of embedded agency, in Leca B., Suddaby R. & Lawrence T. B. (Eds) *Institutional work: Actors and agency in institutional studies of organizations*, pp. 31-58. Cambridge University Press, Cambridge.
- Battilana J., Leca B. & Boxenbaum E. (2009) How actors change institutions: Towards a theory of institutional entrepreneurship, *The Academy of Management Annals*, 3(1), 65-107. doi: 10.1080/19416520903053598
- Cardiff University / Nesta (2015) *Options for developing a national innovation body for Wales, report to the innovation advisory council for Wales*. Retrieved from https://businesswales.gov.wales/expertisewales/sites/expertisewales/files/options_for_developing_a_nib_for_wales.pdf.
- Carvalho L. & Vale M. (2018) Biotech by bricolage? Agency, institutional relatedness and new path development in peripheral regions, *Cambridge Journal of Regions, Economy and Society*, 11(2), 275-295. doi: 10.1093/cjres/rsy009
- CM International (2011) *Evaluation of the classic knowledge transfer partnership programme in Wales*.

CM International & The Innovation Partnership (2014) *Academic expertise for business programme: final evaluation report*.

CM International & The Innovation Partnership (2016) End of programme evaluation of the smartcymru RD&I financial support for business programme.

Coenen L., Moodysson J. & Martin H. (2015) Path renewal in old industrial regions: Possibilities and limitations for regional innovation policy, *Regional Studies*, 49(5), 850-865. doi: 10.1080/00343404.2014.979321

Cooke P. (2008) Regional innovation systems: Origin of the species, *International Journal of Technological Learning, Innovation and Development*, 1(3), 393-409. doi: 10.1504/IJTLID.2008.01998

Davies D.(2017) Firms had £244m despite no-grants pledge by ministers *BBC News*. Retrieved from <https://www.bbc.co.uk/news/uk-wales-politics-41525260>

Dawley S. (2014) Creating new paths? Offshore wind, policy activism, and peripheral region development, *Economic Geography*, 90(1), 91-112. doi: 10.1111/ecge.12028

Dimaggio P. (1988) Interest and agency in institutional theory, in Zucker L. G. (Ed) *Institutional patterns and culture*, pp. 3-22. Ballinger Publishing Company, Cambridge, Mass.

Edler J. & Fagerberg J. (2017) Innovation policy: What, why, and how, *Oxford Review of Economic Policy*, 33(1), 2-23. doi: 10.1093/oxrep/grx001

Edler J. & James A. D. (2015) Understanding the emergence of new science and technology policies: Policy entrepreneurship, agenda setting and the development of the European framework programme, *Research Policy*, 44(6), 1252-1265. doi: 10.1016/j.respol.2014.12.008

Emirbayer M. & Mische A. (1998) What is agency?, *American Journal of Sociology*, 103(4), 962-1023. doi: 10.1086/231294

- European Commission (2006) Community framework for state aid for research and development and innovation, *Official Journal of the European Union*,, C 323/01.
- European Commission (2014) *Framework for state aid for research and development and innovation*, swd(2014) 163/164. Retrieved from http://ec.europa.eu/competition/state_aid/modernisation/rdi_framework_en.pdf.
- Feldman M. & Francis J. L. (2006) Entrepreneurs as agents in the formation of industrial clusters, in Asheim B., P. C. & Martin R. (Eds) *Clusters and regional development: Critical reflections and explorations.*, pp. 115-136. Routledge, London/New York.
- Flanagan K. & Uyarra E. (2016) Four dangers in innovation policy studies – and how to avoid them, *Industry and Innovation*, 23(2), 177-188. doi: 10.1080/13662716.2016.1146126
- Flanagan K., Uyarra E. & Laranja M. (2011) Reconceptualising the ‘policy mix’ for innovation, *Research Policy*, 40(5), 702-713. doi: 10.1016/j.respol.2011.02.005
- Francis B. (2018) *Response to the national assembly for Wales economy infrastructure and skills committee's research and innovation in Wales inquiry*. Retrieved from <http://www.senedd.assembly.wales/documents/s79770/12.%20fsb.pdf>.
- FSB Wales (No date) *Small firms, big issues*, Cardiff. Retrieved from <https://www.fsb.org.uk/docs/default-source/Publications/policy/rpu/wales/assets/fsbinserteng.pdf?Status=Master&sfvrsn=1>.
- Grabher G. (1993) The weakness of strong ties: The lock-in of regional development in the ruhr area, in Grabher G. (Ed) *The embedded firm: On the socioeconomics of industrial networks*, pp. 255-277. Routledge, London.
- Grillitsch M. (2018) Following or breaking regional development paths: On the role and capability of the innovative entrepreneur, *Regional Studies*, 1-11. doi: 10.1080/00343404.2018.1463436

- Grillitsch M. & Sotarauta M. (2018) *Regional growth paths: From structure to agency and back*.
- Guilford G. (2013) *Investing in growth and jobs: An independent review of arrangements for implementation of European structural funds programmes 2014 - 2020*. Retrieved from <https://gov.wales/docs/wefo/publications/130314guilfordreporten.pdf>.
- Guler I., Guillén M. F. & Macpherson J. M. (2002) Global competition, institutions, and the diffusion of organizational practices: The international spread of iso 9000 quality certificates, *Administrative science quarterly*, 47(2), 207-232. doi: 10.2307/3094804
- Hardy C. & Maguire S. (2017) Institutional entrepreneurship and change in fields, in Greenwood R., Oliver C., Lawrence T. B. & Meyer R. E. (Eds) *The sage handbook of organizational institutionalism*, pp. 261-280. Sage Publications, London.
- Hargrave T. J. & Van De Ven A. H. (2009) Institutional work as the creative embrace of contradiction, in Leca B., Suddaby R. & Lawrence T. B. (Eds) *Institutional work: Actors and agency in institutional studies of organizations*, pp. 120-139. Cambridge University Press, Cambridge.
- Hassink R., Isaksen A. & Trippel M. (2019) Towards a comprehensive understanding of new regional industrial path development, *Regional Studies*, 1-10. doi: 10.1080/00343404.2019.1566704
- Heaphy E. D. (2013) Repairing breaches with rules: Maintaining institutions in the face of everyday disruptions, *Organization Science*, 24(5), 1291-1315. doi: 10.1287/orsc.1120.0798
- Henderson D. (2000) EU regional innovation strategies: Regional experimentalism in practice?, *European Urban and Regional Studies*, 7(4), 347-358. doi: 10.1177/096977640000700404

Henderson D. (2019) Policy path dependency in a less developed region: The evolution of regional innovation policy in Wales (UK), *Revista Galega de Economía*, 28(3), 44-63.

<http://www.usc.es/econo/RGE/benvidag.htm>

House of Commons Welsh Affairs Select Committee (2009) *Globalisation and its impact on Wales: Oral and written evidence, second report of session 2008-2009*, London.

ICF Consulting (2018) *Mid-term evaluation of business support services in Wales: A report for the Welsh government, gsr report number 67/2018.*, Cardiff. Retrieved from

<https://gov.wales/docs/caecd/research/2018/181213-evaluation-business-support-services-midterm-en.pdf>.

Innovation Advisory Council for Wales (2018) *Minutes - 8th june*. Retrieved from

<https://businesswales.gov.wales/innovation/innovation-advisory-council-wales>.

Jepperson R. L. (1991) Institutions, institutional effects and institutionalism, in Powell W. W. & DiMaggio P. (Eds) *The new institutionalism in organizational analysis*, pp. 143-163.

University of Chicago Press, London.

Jones-Evans D. (2015) *Is innovate UK letting Wales down?* Retrieved from

<http://dylanje.blogspot.com/2015/07/is-innovate-uk-letting-down-wales.html>.

Jones-Evans D. & Bristow G. (2010) *Innovation and objective 1 programme in Wales: Lessons for the convergence fund*.

Kay A. (2005) A critique of the use of path dependency in policy studies, *Public Administration*, 83(3), 553-571. doi: DOI 10.1111/j.0033-3298.2005.00462.x

Kay A. (2006) *The dynamics of public policy: Theory and evidence*. Edward Elgar Publishing.

Kingdon J. W. (1984/2003) *Agendas, alternatives, and public policies*. Longman, New York.

- Lawrence T. B., Leca B. & Zilber T. B. (2013) Institutional work: Current research, new directions and overlooked issues, *Organization Studies*, 34(8), 1023-1033. doi: 10.1177/0170840613495305
- Lawrence T. B. & Suddaby R. (2006) Institutions and institutional work, *The Sage Handbook of Organization Studies*, 2, 215-254.
- Lawrence T. B., Suddaby R. & Leca B. (2009) Introduction: Theorizing and studying institutional work, in Leca B., Suddaby R. & Lawrence T. B. (Eds) *Institutional work: Actors and agency in institutional studies of organizations*, pp. 1-28. Cambridge University Press, Cambridge.
- Lawrence T. B., Suddaby R. & Leca B. (2011) Institutional work: Refocusing institutional studies of organization, *Journal of Management Inquiry*, 20(1), 52-58. doi: 10.1177/1056492610387222
- Lok J. & De Rond M. (2013) On the plasticity of institutions: Containing and restoring practice breakdowns at the cambridge university boat club, *Academy of management journal*, 56(1), 185-207. doi: 10.5465/amj.2010.0688
- Magro E., Navarro M. & Zabala-Iturriagoitia J. M. (2014) Coordination-mix: The hidden face of STI policy, *Review of Policy Research*, 31, 367-389. doi: 10.1111/ropr.12090
- Magro E. & Wilson J. R. (2013) Complex innovation policy systems: Towards an evaluation mix, *Research Policy*, 42(9), 1647-1656. doi: 10.1016/j.respol.2013.06.005
- Martin R. (2010) Roepke lecture in economic geography; rethinking regional path dependence: Beyond lock-in to evolution, *Economic Geography*, 86(1), 1-28.
<http://www.jstor.org/stable/27806893>
- Martin R. & Sunley P. (2006) Path dependence and regional economic evolution, *Journal of Economic Geography*, 6(4), 395-437. doi: 10.1093/jeg/1bl012

- Matti C., Consoli D. & Uyarra E. (2016) Multi level policy mixes and industry emergence: The case of wind energy in Spain, *Environment and Planning C: Politics and Space*, 35(4), 661-683. doi: 10.1177/0263774X16663933
- Micelotta E. R. & Washington M. (2013) Institutions and maintenance: The repair work of Italian professions, *Organization Studies*, 34(8), 1137-1170. doi: 10.1177/0170840613492075
- Morgan K. (1997) The learning region: Institutions, innovation and regional renewal, *Regional Studies*, 31(5), 491-503. doi: 10.1080/00343409750132289
- Morgan K. (2013) Path dependence and the state: The politics of novelty in old industrial regions, in Cooke P. (Ed) *Re-framing regional development: Evolution innovation and transition*, pp. 318-340. Routledge, Abingdon (Oxon).
- Morgan K. (2016) Nurturing novelty: Regional innovation policy in the age of smart specialisation, *Environment and Planning C: Politics and Space*, 35(4), 569-583. doi: 10.1177/0263774X16645106
- Parker J., Luxton J., Strachan G. & Thomas L. (2015) *WEFO cross-cutting themes evaluation equality and sustainability*. Retrieved from <https://gov.wales/docs/wefo/publications/151222-cross-cutting-evaluation.pdf>.
- Pierson P. (2000) Increasing returns, path dependence, and the study of politics, *The American Political Science Review*, 94(2), 251-267. doi: 10.2307/2586011
- Pierson P. (2004) *Politics in time. Institutions, history, and social analysis*. Princeton University Press, Princeton.
- Pierson P. (2006) Public policies as institutions, in Shapiro I., Skowronek S. & Galvin G. (Eds) *Rethinking political institutions. The art of the state*. New York University Press, London.

Pugh R. (2014) 'Old wine in new bottles'? Smart specialisation in Wales, *Regional Studies, Regional Science*, 1(1), 152-157. doi: 10.1080/21681376.2014.944209

Reid G. (2018) *Review of government funded research and innovation in Wales, for and on behalf of the Welsh government*, Cardiff. Retrieved from <https://gov.wales/docs/det/publications/reid-review-en.pdf>.

Renzetti C. M. & Lee R. M. (1993) *Researching sensitive topics*. Sage, London.

Scott W. R. (2014) *Institutions and organizations*. Sage Publications, Thousand Oaks, California.

Servini N.(2009) 'Grant culture over' warns Jones *BBC News*. Retrieved from <http://news.bbc.co.uk/1/hi/wales/8301385.stm>

Simmie J. (2012) Path dependence and new technological path creation in the danish wind power industry, *European Planning Studies*, 20(5), 753-772. doi: 10.1080/09654313.2012.667924

Smith H. L. (2018) Entrepreneurship policies and the development of regional innovation systems: Theory, policy and practice, in Isaksen A., Martin R. & Trippel M. (Eds) *New avenues for regional innovation systems-theoretical advances, empirical cases and policy lessons*, pp. 239-256. Springer, Cham.

Sotarauta M. & Mustikkamäki N. (2015) Institutional entrepreneurship, power, and knowledge in innovation systems: Institutionalization of regenerative medicine in tampere, finland, *Environment and Planning C: Government and Policy*, 33(2), 342-357. doi: 10.1068/c12297r

Sotarauta M. & Pulkkinen R. (2011) Institutional entrepreneurship for knowledge regions: In search of a fresh set of questions for regional innovation studies, *Environment and Planning C: Government and Policy*, 29(1), 96-112. doi: 10.1068/c1066r

The Innovation Partnership (2015) *Final evaluation report for the Welsh government business innovation support project*. Retrieved from <https://gov.wales/docs/caecd/research/2015/150619-welsh-government-business-innovation-support-project-en.pdf>.

Uyarra E., Flanagan K., Magro E., Wilson J. R. & Sotarauta M. (2017) Understanding regional innovation policy dynamics: Actors, agency and learning, *Environment and Planning C: Politics and Space*, 35(4), 559-568. doi: 10.1177/2399654417705914

Valdaliso J. M., Magro E., Navarro M., Aranguren M.-J. & Wilson J. R. (2014) Path dependence in policies supporting smart specialisation strategies: Insights from the basque case, *European Journal of Innovation Management*, 17(4), 390-408. doi: doi:10.1108/EJIM-12-2013-0136

Welsh Assembly Government (2010) *Economic renewal: A new direction*, Cardiff.

Welsh Government (2014) *Innovation Wales*, Cardiff. Retrieved from <http://gov.wales/docs/det/publications/140313innovationstrategyen.pdf>.

Welsh Government (2018) *Prosperity for all: Economic action plan*. Retrieved from <https://gov.wales/topics/businessandconomy/economic-action-plan/?lang=en>.

Yin R. (1994) *Case study research: Design and methods*. Sage Publishing, California.

Zilber T. B. (2009) Institutional maintenance as narrative acts, in Leca B., Suddaby R. & Lawrence T. B. (Eds) *Institutional work: Actors and agency in institutional studies of organizations*, pp. 205-235. Cambridge University Press, Cambridge.

Notes:

ⁱ <https://gov.wales/statistics-and-research/regional-gross-value-added-sub-regional-gross-value-added/?lang=en>

ⁱⁱ <https://gov.wales/statistics-and-research/research-development-expenditure/?lang=en>

³ ESIF funds are managed by the EU countries (including Wales), in contrast to central EU funds delivered directly by the EC Directorate Generals Regio and Enterprise and Innovation.

⁴ Business Wales is Welsh Government's principal business support programme, and also part-funded by ERDF. The recent mid-term evaluation reported the creation of 8,223 jobs (Full-Time Equivalent jobs, FTEs) in the period 2016 to 2018 (ICF Consulting, 2018). In comparison jobs created by Smart Cymru in the period 2009-2015 amounted to 154 FTEs across Wales (CM International & The Innovation Partnership, 2016). The evaluation Smart Cymru evaluation does note, however, that its outputs are expected to take some time to fully emerge.

⁵ <https://businesswales.gov.wales/innovation/advances-wales>

⁶ This included active engagement of Welsh Government officials in consultations on the prioritisation of ESIF (Guilford, 2013) (Interview 5).

⁷ Innovate UK is the government agency with principle responsibility for funding of business innovation in the UK.

⁸ The main exception here was Welsh Government officials' successful leverage of funds from the Innovate UK KTP Scheme (CM International, 2011) (Interview 13).

⁹ The maximum level of public aid (expressed as a percentage) allowable to project beneficiaries (European Commission, 2014: 28).

¹⁰ For example, in Welsh Government's privileged position of lead agency for innovation policy, its ability to deliver Pan-Wales strategic projects, and its track record of delivering such programmes over time.