Institution: Swansea University

Unit of Assessment: 17

Title of case study: Swansea Bay City Region innovation ecosystem: creating the conditions for ideas to thrive in South West Wales

Period when the underpinning research was undertaken: 2004 - 2018

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
David Blackaby	Professor	Sept 1982-Nov 2020
Gareth Davies	Dr	Jul 2003-2009 and Aug 2012-present
Louisa Huxtable-Thomas	Dr	March 2013-present
Lynn Mainwaring	Professor	Oct 1988-present
Nick Rich	Professor	Sept 2013-present
Sian Roderick	Senior Lecturer	June 2013-present
Mike Sullivan	Professor	Oct 2013-March 2018
Mike Williams	Professor	March 2001-present

Period when the claimed impact occurred: 2016 – present

Is this case study continued from a case study submitted in 2014? No

1. Summary of the impact

Since the collapse of traditional industry in Wales, policy makers and practitioners have sought to reduce economic deprivation by expanding the knowledge economy. Our research has encouraged the Welsh Government to invest in developing an open access open innovation (OAOI) approach. Such an approach can facilitate a more open exchange of ideas between industry and universities so that, ultimately, commercial opportunities can be maximised. The resulting flagship initiative is AgorIP. Established in 2016, this initiative has received over GBP13,000,000 from the Welsh Government and the European Regional Development Fund (matched by Swansea University) and is funded until at least 2023. AgorIP is helping individuals and organisations realise the potential of their ideas, products and research. This has resulted in a tenfold increase in IP income for the university, historically around GBP50,000 per year and now over GBP500,000. Furthermore, AgorIP has forged strong links with medical practitioners, resulting in service innovations such as an app to help prevent eating disorders and a simple blood test that could make it easier for GPs to diagnose bowel cancer. The OAOI approach developed by the research team has also been cited by organisations such as Pfizer and HPC Wales as crucial in forming collaborations and attracting additional investment.

Evidence of the extended policy impact is the GBP1,300,000,000 UK Government investment in the Swansea Bay City Region City Deal. Our research into OAOI is cited as an important contributor to this initiative.

REACH: The impact across the South West Wales region has directly resulted in income generation, new companies and employment, improvements to NHS services, the development of collaborative partnerships, contribution to large-scale regional investment from the UK Government, and the recommendation to replicate across the UK.
SIGNIFICANCE: Stimulating economic activity in a region with high rates of deprivation by removing barriers to commercialisation and improving conditions so that innovation can thrive.

2. Underpinning research

Following the collapse of its traditional industry and manufacturing sectors, Wales has faced substantial economic deprivation and has sought to restructure its economy over the last three decades **[R3].** Examining this complex issue, the School of Management's iLab research centre has focused on the role of universities in a post-industrial region. Its research has provided novel frameworks that have since proven effective in overcoming the barriers to commercialisation faced in marginal economies. With the aim of informing both policy and practice, the research has been both theoretical and applied.

Universities in the knowledge economy
In 2004, our research informed the Welsh Government's *Knowledge Economy Nexus* report **[R1],** providing actionable insight for policy makers and practitioners by examining the local context and international models of university-industry engagement. Specific opportunities and requirements were identified, including greater industry accessibility to academic expertise and the need for a more integrated research commercialisation system across Wales. These opportunities and requirements became policy recommendations, resulting in initiatives (see Section 4) that were also examined as part of the ongoing research agenda. As noted by the Review Chair, '*The inputs provided by Swansea University to this review were an important part of identifying the knowledge-economy opportunities and challenges in developing stronger university-industry technology-transfer interactions*' **[C2].**

University intellectual property (IP)
Parallel research into university IP generation, specifically patenting **[R2]**, was conducted. This research identified challenges for regions, including South Wales, where impact had been stymied by structural issues within academic and industry research structures, notably in relation to scale and co-ordination. **[R1]** and **[R2]** resulted in a policy recommendation for a shared IP commercialisation body, which eventually led to the AgorIP initiative (see Section 4).

The characteristics of sub-regions
Our research also extended investigation of regional innovation system dynamics by contributing the novel consideration of the sub-regional level **[R3]** [**R6]**. This research identified the need for policy makers and practitioners to recognise a broader innovation ecosystem. It also identified effective methods through which corporate entities could embed their research and development (R&D) activities within universities. Novel insights included the role of shared infrastructure in supporting the development of critical mass in research output and the need for a diversity of specialisms and sectors.

A pilot of the shared infrastructure for public organisations, start-ups, and larger partners recommended in **[R3]** provided these actors with a physical workspace and other resources to support innovation. Research into this pilot continued to provide valuable insights into what was becoming the South West Wales (sub-regional) life sciences and health ecosystem **[R4].** The outcomes of this study were that the impacts of innovation-focused regional economic development initiatives extended beyond both their targeted core sector and initial funded timescales. The resulting policy recommendations were to consider the protracted timescales over which impact should be expected and to open the access to facilities beyond targeted technology sectors. This approach was labelled 'open access open innovation' (OAOI). This research contributed to the nascent economic theory of smart specialisation, which was then used to inform the Swansea Bay City Region (SBCR) City Deal (Section 4)**.**

Continuing research in parallel suggested a more complex role for OAOI knowledge and technology transfer services **[R6]**, alongside the types of infrastructure suggested in **[R4].** Insight from **[R3]** was used to identify sector-specific opportunities suitable for the region. In doing so, it provided the foundation for evaluating the expected impact of exploiting the regional capabilities **[R5]**.

3. References to the research

[R1] – Knowledge Economy Nexus: Role of Higher Education in Wales, Report of Welsh Assembly Government's Higher Education and Economic Development Task and Finish Group, (2004) inc. ***Davies G.H*** whilst seconded to Welsh Government (WGs) from SU to complete this work at WG's request**.** [Digital version available on request]
[R2] - *Beale, A.,* ***Blackaby, D., & Mainwaring, L.*** (2008). University patenting in Wales, Scotland and Northern Ireland: a comparative analysis. *Higher Education Quarterly*, *62*(1-2), 101-119. DOI: 10.1111/j.1468-2273.2008.00377.x **ABS 2***
[R3] - *Abbey, J.,* ***Davies, G.H., & Mainwaring, L.*** (2008). Vorsprung durch Technium: Towards a system of Innovation in South-west Wales. *Regional Studies*, *42*(2), 281-293. DOI: 10.1080/00343400601147281 **ABS 3***
[R4] - ***Davies, G.H.,*** *Clement, R,* ***Huxtable-Thomas, L.,*** *Johnson, G., Perkins, B.,* ***Roderick, S.,*** *Gregory, J., Rodde, B., & Daniels, J.* (2018). Life Sciences and Health in South West Wales: A Sub-regional Innovation Ecosystem. In *Entrepreneurial Learning City Regions* (pp. 267-292). Springer, Cham. DOI: 10.1007/978-3-319-61130-3_16
[R5] – ***Blackaby, D., Davies, G.H., Rich, N. Sullivan, M., Williams, M***. iLab – Internet Coast: Phase 1, City Deal Proposal Impact Appraisal, Swansea University, 2017 [Confidential, digital version available on request for audit purposes]
[R6] – ***Davies, G.H., Roderick S****., &* ***Williams M***. (2018), A sub-regional innovation ecosystem? Life sciences and health in the Swansea Bay City Region. International Journal of Innovation and Regional Development, 8(4) DOI: 10.1504/IJIRD.2018.097456

Grants
[G1] Prof Mike Williams (PI), Oct 2016 to June 2023, AGOR IP WEST, ERDF, c80986, GBP10,222,000
[G2] Prof Mike Williams (PI), Oct 2016 to June 2023, AGOR IP EAST, ERDF, c82051, GBP2,927,000

4. Details of the impact

The following paragraphs describe how our research helped create a network of facilities and initiatives to enable a thriving innovation ecosystem. This ecosystem in turn, led to new policy, investment in intervention, and subsequent wealth creation.

Impact on policy, practice, and public services

The *Knowledge Economy Nexus* **[R1]** report provided a roadmap for improved university-industry engagement and further research in Wales. Working for policy makers and practitioners, we identified the challenges and opportunities related to university patenting. Later, we provided more specific insights into how an innovation ecosystem in South West Wales could work **[R3]**. Our research was crucial to secure the buy in of policy makers across the region and resulted in the formation of private/public collaborative partnerships, such as the development of a shared IP commercialisation capability (AgorIP) **[C1].** According to the Chair of the *Knowledge Economy Nexus* report, '*AgorIP, together with other relevant knowledge-economy related initiatives such as the Swansea Bay City Region Deal, resonates with the recommendations of the review. The associated open- innovation philosophy of this work, along with a strong long-term perspective, supports the principles espoused by the review and sustainable future ambitions for Wales such as those enshrined in our Wellbeing of Future Generations Act.'* **[C2].**

Impact on investment, infrastructure, and the economy

The following paragraphs highlight the scale and nature of the impact of our research, as noted by key stakeholders.

AgorIP
Based on the principles and understanding of regional ecosystems established in **[R1]** and **[R2],** AgorIP was created thanks to investment of over GBP13,000,000 from the Welsh Government and the European Regional Development Fund (matched by Swansea University). It was

established in 2016 and is funded until at least 2023 **[G1 & G2] [C1]**. AgorIP supports the commercialisation of ideas, products, and research through a transparent process that seeks the most appropriate route to market, be it start-up, spin-out, licensing, or R&D. This scheme has resulted in a tenfold increase in IP income for the university, historically around GBP50,000 per year and now over GBP500,000 **[C3].**

AgorIP draws upon the OAOI insights in **[R2], [R3]** and **[R6]**, which recommended multi-stakeholder collaboration in the local regional innovation system to deliver integrated regional technology transfer activity. Strong links with medical practitioners have resulted in service innovations such as an app to help prevent eating disorders and a simple blood test that could make it easier for GPs to diagnose bowel cancer **[C4].** As noted by the Health Secretary for Wales, Vaughan Gethin, *'The AgorIP project is full of examples where science and healthcare are working together at the forefront of clinical innovation. I strongly support the NHS working confidently with university and industry partners, linking better health technologies and services to economic growth opportunities in Wales'* **[C1].** Furthermore, Economic Secretary for Wales, Ken Skates, said, *'The AgorIP project is one that is truly worthy of celebration. Projects like the app to prevent eating disorders developed in partnership with Aneurin Bevan University Health Board have the potential to drive tangible results and economic benefits'* **[C1].**

In 2018, AgorIP featured as an exemplar in a report for the UK Government's Department for Business, Energy and Industrial Strategy (BEIS) on the commercialisation of university IP. The report states that the model recommended by Swansea University could *'provide a model for other research-intensive but lower-commercialising universities to help them generate impact'* **[C5].**

Swansea Bay City Deal (SBCR City Deal)

Research into sub-regional innovation systems **[R3]** revealed the need for shared infrastructure inhabited by a diverse population of specialisms and sectors. These findings influenced the SBCR City Deal to promote shared resources and encouraged projects to work together across disciplines in an OAOI paradigm **[C6] [C7].** This research helped secure the City Deal, consisting of GBP1,300,000,000 investment from the private sector and the UK, Welsh, and local governments. The City Deal was launched at Swansea University in May 2017 by the Rt Hon. Theresa May. As stated by Swansea Bay City Deal Joint Committee Chairman, Cllr Rob Steward **[C7],** *'Insight of the opportunities of the Open Innovation model applied and the accompanying novel appraisal approach developed by iLab were important components of the submission, which contributed to securing the £1.3 billion investment and the downstream benefits that the City Deal will deliver'.*

Institute of Life Sciences (ILS)

OAOI activities for health innovation realised within a purpose-built six-storey facility led to further sector-specific development involving academia, health services, and industry. Drawing on the research in **[R1],** using the ecosystem opportunities identified in **[R3]** and with subsequent phases informed by **[R6],** ILS has attracted inward investment in the current REF period from the multinationals Pfizer and Fujitsu **[C8], [C9]**. According to the Managing Director of Pfizer UK, '*The increase in levels of innovation activity […] made possible by this research, are part of the ecosystem which has attracted us to work so closely with the region'* **[C9].** Furthermore, as noted by (then) Welsh Government Cabinet Secretary for Health, Wellbeing and Sport, Vaughan Gething, said: '*This collaboration has great potential to bring real benefits to patients in Wales*' **[C8].**

High Performance Computing (HPC) Wales

This major initiative established world-class HPC facilities infrastructure and trained many hundreds of practitioners across Wales. As its former CEO stated, *'The initial HPC Wales business plan built upon insight from research at Swansea University for open access open innovation models in localised application of HPC'* **[C10].** The CEO also noted that HPC Wales provided a catalyst for later initiatives, including Supercomputing Wales. This initiative provides university research teams access to powerful computing facilities so that they can undertake high-profile science and innovation projects.

5. Sources to corroborate the impact

Where organisations provide testimonials below, in what capacity they are involved with the impact follows in brackets:

[C1] Welsh Government – Joint Ministerial Statement
Joint Ministerial statement on the launch of AgorIP.
https://businessnewswales.com/20m-agorip-project-investment-to-boost-innovation-in-wales/
[C2] Welsh Government *Knowledge Economy Nexus* Chair's Statement
Statement from the Chair presenting the role and impact of the School of Management's work for policy and practice. PDF available on request.
[C3] Step-change in start-up/technology transfer activity
Metrics that show increase in IP/start-up activity since the establishment of AgorIP
https://www.hesa.ac.uk/data-and-analysis/business-community/ip-and-startups
[C4] Evidence of healthcare innovations supported by AgorIP
http://www.fairwatermedicalcentre.wales.nhs.uk/news/45166 and
https://www.agorip.com/casestudies/biomarker-for-colorectal-cancer-in-primary-care/
[C5] Report for BEIS on commercialisation of University IP
AgorIP cited in report to UK Government Business, Energy and Industrial Strategy department (BEIS).
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/699441/university-ip-commercialisation-research.pdf
[C6] Submission document for Swansea Bay Region City Deal and resulting Deal document signed by UK Prime Minister, First Minister of Wales, and others
PDFs available on request.
[C7] SBCR City Region – statement from Cllr Rob Steward
Statement from SBCR Leadership acknowledging the role of SU research in developing the philosophy underpinning the City Deal. PDF available on request. (Reporter)
[C8] Opening of new regional R&D centres
Global firms Fujitsu and Pfizer have established R&D centres within Swansea University to support their Open Innovation activities, with a focus on SBCR Themes.
https://www.walesonline.co.uk/news/wales-news/pharma-giant-pfizer-set-up-12735075
[C9] Letter from Managing Director, Pfizer UK
Statement from Pfizer acknowledging the role of SU research in realising our collaboration with the company. PDF available on request. (Reporter)
[C10] HPC Wales letter
Statement from former CEO acknowledging the role of our OAOI research in building the HPC project.(Reporter)