

Institution: Queen's University Belfast		
Unit of Assessment: 17		
Title of case study: Stronger together: identifying and fostering industrial clusters across borders – Ireland and Northern Ireland.		
Period when the underpinning research was undertaken: 2003 - 2015		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s): Nola Hewitt-Dundas	Role(s) (e.g. job title): Professor	Period(s) employed by submitting HEI: 2003-2021
Period when the claimed impact occurred: November 2015 - 2020		
Is this case study continued from a case study submitted in 2014? No		
1. Summary of the impact		
<p>Spanning two countries, Ireland and the UK, research and engagement with policy makers led to the identification of industrial clusters across national borders and a change in policy to support innovation and business development. Three cross-border industrial clusters were identified: software, medical devices and the most significant, pharmaceuticals. The research has resulted directly in a major cross-border business development body targeting its efforts on life and health sciences, and on the bio economy. This coordination of policy across the island of Ireland has already led to substantial EU funding success, the formation of an all-island cancer trials network, and the development of a pharmaceutical vendor supply chain.</p>		
2. Underpinning research		
<p>A fractured all-island economy, spanning north and south of the Irish border, provides the context for a research programme focused on business innovation and competitiveness commencing in 2003 and undertaken by Prof Hewitt-Dundas. The research has concentrated on two strands: (1) innovation systems, i.e., the interrelationship between business, education, and government and (2) the effect of public sector intervention to enhance innovation success, business growth and profitability.</p> <p>The first strand of research on innovation systems undertaken by Prof Hewitt-Dundas collaboratively with Prof Eoin O'Malley, Economic and Social Research Institute, Dublin and Prof Stephen Roper, Warwick Business School between 2003 and 2005, examined the comparative strengths and weaknesses of the all-Island innovation system, relative to 10 other small economies across Europe and Asia (Ref 1). This work highlighted the unique business structure in Ireland, dominated by foreign-owned multinationals alongside a weaker indigenous business sector. The research also highlighted the importance of strengthening relationships between businesses for technology and knowledge transfer to enhance innovation and competitiveness, as well as the criticality of developing synergy between other public and private sector organisations in the economy.</p> <p>Complementing this work, the second research strand examined different mechanisms by which government could stimulate business innovation and the effectiveness of such policy. This programme of work was jointly and equally undertaken by Prof Hewitt-Dundas and Prof Stephen Roper, Warwick Business School (2003-2015) and examined the direct effect of government support for business research and development (R&D) on business innovation and performance (Ref 2) as well as the wider economic effect of this (Ref 3). It also examined how public investment in R&D centres could catalyse innovation by other businesses through supply-chain and informal networks (Ref 4) and indeed, the varying impact of patents, investment in R&D and collaboration with other organisations on the success of business innovation efforts (Ref 5). Collectively this programme of research identified the effect of government support for R&D on business innovation in Ireland, and the wider economic and societal benefits of this support in addition to the interrelationships between business R&D, intellectual property, innovation, the labour market, business networks and institutional changes.</p>		

This deep understanding of the all-island economy led InterTradeIreland, the cross-border body for business development, overseen by representatives of Government Departments in Ireland and Northern Ireland, to commission further research in early 2015, to identify emerging clusters with significant economic potential across the National borders (Ref 6). This research was undertaken by an all-island research team comprising Prof Chris van Egeraat, National University of Maynooth, Ireland (lead investigator), Prof Edgar Morgenroth, Economic and Social Research Institute (ESRI), Dublin and Prof Nola Hewitt-Dundas, Queen's University Belfast. The purpose of this research was to overcome the inability to identify clusters across national borders. If identified accurately, then the potential for benefits from business relationships and co-operation may generate economic advantages that compensate for the geographical peripherality of Ireland, on the western edge of Europe. Prof Hewitt-Dundas led the theoretical development of the project, analysis and prioritisation of sectoral clusters emerging from the data, interviewing of organisations for the sector analysis and jointly co-authored the final report including the policy recommendations.

Drawing on the study of symbiotic relationships in biology, the research developed a new measurement index for identifying clusters across national borders, using both the size and number of businesses and incorporating commuting data, rather than administrative areas. After reconciling significant differences in official data, industrial sectors were classified and mapped according to their clustering and potential for cross-border development. Three cross-border sectoral clusters with significant potential for further development were identified (pharmaceuticals, software and medical devices), and case studies of each identified benefits arising from further development in terms of: labour market; education and training; infrastructure; goods and services markets; research, technology and innovation; and institutional supports.

Key findings of the research, relevant to impact included the following (Ref 6):

- **Policy Design:** Targeted sectoral collaboration is more likely to stimulate innovation than broader all-island innovation initiatives, as based historically on political or spatial concentrations.
- **Policy Focus:** Priority sectoral clusters for development include Pharmaceuticals, Software and Medical Devices and interventions should target research, technology and innovation, and education and training.
- For Pharmaceuticals, despite a low level of all-island integration, substantial benefits are possible through (1) Strengthening the cross-border coordination of research centres, institutes and networks, (2) Establishing an all-island network for interoperable clinical trials, (3) Further integration and development of the vendor sector, and (4) Greater co-ordination of education and training.

3. References to the research

1. O'Malley, E., Hewitt-Dundas, N., and Roper, S., (2008) 'High growth and innovation with low R&D: Ireland' in Edquist, C and Hommen, L (eds.), *Small Economy Innovation Systems: Comparing Globalisation, Change and Policy in Asia and Europe* (2008), Edward Elgar. ISBN: 978 1 84542 584 5
2. Hewitt-Dundas, N and Roper, S. (2009) Output Additionality of Public Support for Innovation: Evidence for Irish Manufacturing Plants, *European Planning Studies, EUNIP Special Issue: Territorial Industrial Development Policies and Innovation*, Vol. 18, No.1, pp.107 – 122; DOI: 10.1080/09654310903343559. Cited 116 times (Source: Google Scholar)
3. Roper, S Hewitt-Dundas, N and Love, J H (2004) 'An Ex Ante Evaluation Framework for the Regional Benefits of Publicly Supported R&D Projects', *Research Policy*, 33, 487-509. DOI: <https://doi.org/10.1016/j.respol.2003.10.002> Peer-reviewed journal. Cited 147 times (Source: Google Scholar)
4. Hewitt-Dundas N and Roper, S (2011) Creating advantage in peripheral regions: The role of publicly funded R&D centres, *Research Policy*, Vol. 40 (July), pp. 832-841, doi:10.1016/j.respol.2011.03.005. Peer reviewed journal. Cited 72 times. (Source: Google Scholar)

5. Roper, S., Hewitt-Dundas, N. (2015) Knowledge stocks, knowledge flows and innovation: Evidence from matched patents and innovation panel data. *Research Policy*, Vol. 44. No. 7. DOI: 10.1016/j.respol.2015.03.003. Peer-reviewed journal. Cited 124 times (Source: Google Scholar)
6. Magennis, E. and Gough, A. (2015) *Mapping the Potential for All-Island Sectoral Ecosystems: A summary report*, InterTradelreland, September 2015, <https://intertradeireland.com/assets/publications/Mapping-the-Potential-for-All-Island-Sectoral-Ecosystems.pdf>

4. Details of the impact

The research has had a substantial and beneficial impact on the work of InterTradelreland (ITI). Established by both the Irish Government and the Northern Ireland Executive, following the 1998 Belfast Agreement, ITI is an all-island trade & business development body with a remit to exchange information and to coordinate work on trade and business development.

The research led to the following:

- The development of a new set of corporate objectives by InterTradelreland,
- The creation of a novel all-island cluster development initiative,
- The development of a new European Union (EU) EUR16,600,000 (GBP14,300,000) funded programme focusing on supporting innovation in small businesses and development of innovation clusters,
- Development of an all-island cancer trials network and a number of major events focusing on clusters.
- The research also informed the development of the Irish government's enterprise strategy.

Impact on the work of InterTradelreland (ITI)

The research report (Ref. 6), *Mapping the Potential of All-island Sectoral Ecosystems* was central to the development of ITI's Corporate Plan 2020 – 2022, providing an evidence base for changes to the organisation's corporate objectives [A]. ITI states that the research stimulated the development of a corporate objective focused on enabling small and medium sized enterprise (SME) collaboration in cross-border clusters, ecosystems and networks [A]. ITI also confirms that the research was critical to the organisation's decision to focus, in its new Corporate Plan, on (i) life and health sciences and (ii) the bio economy as two of its three priority areas for targeted support [A].

Responding to the research recommendations to further develop the all-island pharmaceuticals industry, ITI developed a Biopharmaceuticals Action Plan as a key aspect of its Corporate Plan [A]. This had four critical **objectives**, closely mirroring the research recommendations. These were:

- **Objective 1:** Strengthening all-island co-ordination of research centres, institutions and networks (short-term objective)
- **Objective 2:** Establishing an all-island interoperable clinical trials co-ordination network (medium-term objective)
- **Objective 3:** Integration and development of the vendor sector (long-term objective)
- **Objective 4:** Co-ordination of education and training (long-term objective) [A]

By April 2020, ITI had made significant progress on the first three objectives. In relation to **Objective 1**, ITI states that greater all-island coordination led to an increase of over 100% in the drawdown of EU Horizon 2020 funding for joint Northern Ireland/Ireland projects compared to the drawdown of funding under the EU Framework Programme 7 (FP7) for such cross-border joint initiatives. This meant that, by the second quarter of 2020, a total of GBP110,000,000 had been drawn down from Horizon 2020 for cross-border schemes [A].

This was supported by a further EUR16,600,000 (GBP14,300,000) from the EU's INTERREG VA Programme to support cluster development and innovation in small and medium size enterprises (SMEs). Two strands of this funding are of particular note: the development of a EUR4,900,000 (GBP4,200,000) 'Co-innovate' programme and a EUR1,700,000 (GBP1,500,000) cluster initiative 'Synergy' [A, B].

Building on the research recommendations, the 'Co-Innovate' programme launched in July 2017 with the aim of encouraging and facilitating a higher proportion of SMEs in the border region of Ireland, Northern Ireland and western Scotland to collaborate on research and innovation [B, C]. By April 2020, two years ahead of schedule, the programme had already met its five-year target of supporting the establishment of four research and innovation clusters with two of the five proposed business to business (B2B) partnerships already approved [A, C].

The flexibility and competitive advantage derived from the work of ITI in building innovation capability in SMEs was evident in the early response to the Covid-19 pandemic in March 2020. With EUR300,000 (GBP258,000) of Co-Innovate funding, a cross-border partnership of 18 SMEs was formed to tackle the shortage of Personal Protection Equipment (PPE) which developed in the early stages of the pandemic [D]. Drawing on the innovation capabilities developed through the Co-Innovate programme, the businesses combined precision engineering and plastics to fast-manufacture a low-cost face shield. Within weeks, this partnership was producing over 70,000 visors weekly for health sector organisations [D] with Gina McIntyre, CEO of the Special EU Programmes Body referencing the exemplary "innovative and responsive cross-border approach from these companies" [C]

A second important strand of ITI's business support activity also arose from the *Mapping* study [A]. 'Synergy' was a strategic cross-border initiative which was dedicated to fostering cross-border clusters [G]. Aligning with ITI's **Objective 1**, Synergy operated as a three-year pilot with three quarters of its EUR1,700,000 (GBP1,500,000) budget allocated directly to implementing the action plan presented in the research report. Established in 2018, Synergy employed five staff and, by the end of 2019, had brokered 12 new cross-border collaborative partnerships. It had also engaged more than 400 small businesses, government stakeholders and research institutions to support the development of all-island clusters and ecosystems [A].

One key area of Synergy's activity has involved facilitating the rejuvenation of the All-Ireland Cancer Consortium [A]. This was originally formed in 1999 by government representatives from Ireland, Northern Ireland and the United States with the aim of engaging in cross-border collaboration on cancer research and education [F]. However, more recently and in line with ITI's **Objective 2**, Synergy was able to broker a renewed relationship and, in 2020, the three partners were working towards renewing the Memorandum of Understanding which was last signed in 2011 for a period of five years [A, F]. This engagement had also led to the reintroduction of the US National Cancer Institute to the work of the all-island cancer trials network, involving around ten agencies. By April 2020, this renewed activity had led to the launch of six new cancer trials on an all-island basis [A].

In relation to **Objective 3**, ITI has taken note of the report's recommendation to implement measures to further integrate and develop the vendor sector; the organisation has worked on a vendor supply chain initiative in collaboration with the Health Innovation and Research Alliance of Northern Ireland, and the Health Innovation Hubs in Ireland. This project is designed to provide a platform which will allow businesses to engage with health service organisations and with the island's larger pharmaceutical businesses [A].

Impact on Irish government policy

As a stakeholder in the research and *Mapping* report [H], the Irish government has also benefited from the research. The study informed the government's long-term enterprise strategy [E]. First published in November 2015, 'Enterprise 2025' committed the government to 'Strengthen all-island approaches to sectoral ecosystem development as appropriate and

as opportunities arise to deliver greater economic opportunity and potential for investment and job creation' [E]. ITI was tasked with leading on the delivery of this goal. This document drew on an accompanying background report which considered the options for all island sectoral ecosystems and cites the *Mapping* research, outlining key findings in some detail [E].

An updated enterprise strategy was published in March 2018 as '*Enterprise 2025 Renewed*' [E]. It identified, as a strategic priority, 'Building on our existing strengths and seeking out new opportunities: clustering, collaboration and connections' [E]. Promising a new approach to sectoral development, the strategy states:

In response to ongoing global challenges, we need to strengthen our approach to enhancing the business environment in a way that accounts for sector-specific needs. The more we identify/understand sector specific ecosystem aspects and take the necessary action to mitigate risks, accelerate growth, identify opportunities or remove barriers, the more likely it is that the full potential of a sector will be realised to deliver jobs and economic impact. [E]

This section of the document references the above-mentioned part of the background report to *Enterprise 2025* which cited the *Mapping* study [E].

Establishing platforms for new cluster development

In line with **Objective 4**, greater coordination of education and training, ITI co-hosted a programme of strategically significant conferences and events, providing platforms for the development of new all-island clusters. By April 2020, these had included the European Connected Health Alliance's 3rd and 4th Joint Ecosystem Gatherings (January 2019 and January 2020), which was attended by over 500 business owners, academic and policymakers from both Ireland and Northern Ireland [A]. In addition, ITI co-hosted the island's first biopharmaceuticals conference, 'BioPharma Ambition' (2016), and two subsequent 'Ambition' conferences (2018 and 2020) [A]. With over 700 people at each conference, the Synergy clustering work was showcased in these forums [A] as an exemplar of how policy can enhance innovation capability through business clusters.

5. Sources to corroborate the impact (indicative maximum of 10 references)

- A. Testimonial report from CEO (since retired), InterTrade Ireland (ITI), 3rd April 2020. See Section 3.5 for details of the number of cluster and B2B projects approved. Appendix 2 to this document contains details of ITI's Biopharmaceuticals Action Plan.
- B. Co-Innovate, '[Departments launch Co-Innovate Programme](#)', news release, undated. Note also that, throughout Section 4 above, all conversions to pound sterling of financial figures originally supplied or reported in euros were calculated using currency exchange information available on 15th March 2021, when one euro = £0.86.
- C. Co-Innovate '[Nurturing Ideas, Growing Success](#)', March 2018. This presentation outlines Co-Innovate's programme targets.
- D. Co-Innovate, '[Thousands of health-care visors to be produced with help from Co-Innovate funding](#)', news release, 25th May 2020.
- E. Collated impact source document. This contains references and links to the following Irish government documents: *Enterprise 2025*, *Enterprise 2025 Background Report*, and *Enterprise 2025 Renewed*. It also contains specific page references and additional information to facilitate corroboration of the relevant impact statements.
- F. See Fogarty International Center, '[US-Irish cancer collaboration agreement is renewed](#)', news release, January/February 2012.
- G. Information on Synergy is available on the InterTradeIreland website page, '[Our Strategy](#)'.
- H. '[Mapping the Potential for All-Island Sectoral Ecosystems: A summary report](#)', InterTradeIreland, September 2015, 4. Both the Irish government's then Department of Jobs, Enterprise and Innovation, and the Northern Ireland Executive's then Department of Enterprise, Trade and Investment were represented on the study's Steering Group.