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Knowledge Exchange Seminar Series (KESS)

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Benefitting a regional economy with innovation adoption of high-tech small firms

Summary

Innovation adoption in high-tech small firms (HTSFs) has long been a United Kingdom and European priority, however, despite decades of attention, there is still a dearth of innovative HTSFs and, worryingly low participation levels of HTSFs in United Kingdom and European Research & Development and innovation funding programmes. To capitalise on emerging high-tech markets, it is imperative that HTSFs have the capacity to exploit these new opportunities and crucially, to contribute to the development of a modern economy. Research carried out by the University of Ulster in European projects investigated how policy can help address the dearth of SMEs in European and national innovation funding programmes. The growth of innovative HTSFs has the potential to contribute to both the economic and social development of a regional economy. This presentation addresses these issues and looks at how the research findings might influence the development of SME policy and practices in Northern Ireland.

Research Impact

The promotion of innovation adoption in high-tech small firms (HTSFs) has long been a European priority, but despite decades of attention, there is still a dearth of innovative HTSFs and, worryingly low participation levels of HTSFs in European R&D and innovation funding programmes. To capitalise on emerging high-tech markets it is imperative that HTSFs have the capacity to exploit these new opportunities and crucially, to contribute to the development of a modern economy. This multidisciplinary impact case investigates how to encourage the involvement of HTSFs in European funding projects. The impact of this research includes; methods for promoting the adoption of high-tech innovation across Europe and the development of European HTSF innovation and R&D funding policy recommendations that feed into the European Parliament, Horizon 2020 and numerous national and European high-tech associations and influential EC innovation networks.

Underpinning Research

HTSFs are the lifeblood of modern economies and hence the EU has been working towards creating a friendlier business environment for small businesses by adopting the 'Small Business Act' (SBA) (McAdam *et al.*, 2010). The SBA serves as a useful reference point for the overall focus of this case study: "The EU and Member States should encourage investment in research by SMEs and their participation in R&D support programmes, transnational research, clustering and active intellectual property management by SMEs".

This KESS policy paper refers to a body of related research projects that have been ongoing since the mid 2000s. The research addresses how to nurture innovation adoption by HTSFs, by significantly influencing policy at EU and national level and by promoting European-wide adoption of high-tech innovations. The user-driven and multidisciplinary approach of the research was to engage directly with HTSFs and related stakeholders to investigate the real latent needs that affect their capacity to innovate and promote European wide innovation adoption (Gilmore *et al.*, 2013).

The focus of promoting innovation adoption in HTSFs in this policy briefing is to:

- Report on some of the improvable issues in relation to low participation levels of HTSFs in R&D and innovation funding programmes
- Present headline policy recommendations that have already been submitted to the European Commission, European Parliament and national innovation policy-makers in the EU27 on how to design and implement more effective HTSF innovation funding programmes.
- Provide an overview of a successful European high-tech research and innovation solution.
- Provide an overview of how Ulster University Business School is developing the capacity of SMEs in NI

The research on promoting innovation adoption, from a policy perspective, was built on earlier work (McAdam *et al.*, 2004) that identified the need to harmonise innovation and R&D policy at both a national and EC level. This is essential in facilitating and nurturing the growth of high tech HTSFs and important high-tech sectors (Gilmore *et al.*, 2013). Research on innovation adoption by HTSFs has investigated the role of innovation intermediaries (McAdam and McAdam, 2008), modelling innovation implementation (McAdam *et al.*, 2010) and on a practical side, beta-testing of a range of research experiments has led to the development of the 'Engage' eParticipation innovation toolkit - helping promote wider adoption of European high-tech innovation (Galbraith *et al.*, 2013).

The constant wave of new technologies has raised the opportunity to promote HTSFs to innovate across a wide range of public services and processes. For example, although the European Commission's eGovernment agenda has called for more innovative technologies to enhance citizen engagement in democratic processes, there is a dearth of successful eParticipation innovations, particularly by HTSFs across multiple international markets (Galbraith *et al.*, 2013). Moreover, healthcare innovation adoptions from advances in technology are fundamental to improving the efficiency of health and social care services; however, many healthcare technologies suffer from poor implementation and adoption. Inaccurate assumptions on the user needs and a failure to gain acceptance from slow and encumbering public healthcare procurement bodies are significant barriers to adoption.

The underpinning research in this KESS Policy Briefing was based on

(1) Two major research awards as follows:

MAPEER SME (Making Progress and Economic Enhancement a Reality for SMEs). FP7-SME-2009-1. 2009-2011. Value £136,000. Awarded to Dr Brendan Galbraith.

PARTERRE (Electronic Participation Tools for Spatial Planning and Territorial Development). CIP-ICT-PSP-2009-3bis (FP7). Value £130,000. Awarded to Dr Brendan Galbraith.

(2) A REF impact case study authored by Galbraith and McAdam (2014) that was distinguished as a 'world-leading' impact case study and contributed to the Ulster University Business and Management Research Institute to be ranked 7th in the UK for research impact.

Headline Programme Design Findings from MAPEER SME Policy Study

What are the key success factors for SME programme design?

The following have been identified as key success factors for SME programme design:

Cut red tape:

- speeding up the application and approval process (e.g. 2-3 months time-to contract)
- providing online central guiding tools (one stop-shop)
- offering continuous application times without fixed deadlines
- shortening time to funding
- simplifying reporting requirements.

Offer counselling, mentoring and mediation services (most often through a project officer) both before and during the project.

Concentrate and consolidate the offered services provided by the different funding bodies offering RTDI SME supporting programmes so as to make it easy for SMEs to find the service they need.

2. What are the key elements of programmes that are attractive to SMEs?

- The following key programme elements have been found as particularly attractive to SMEs:
- Having as major scope to transform RTDI results into competitive, new-to-market products/services.
- Offering payment processes and procedures that are in line with the cash flow needs of SMEs.
- Following a bottom-up approach (no thematic restrictions) that could potentially attract all kind of SMEs.
- Nurturing networking between SMEs and knowledge institutions (initiating and promoting co-operation possibilities between universities and SMEs as well as assisting SMEs in terms of incurring the costs for patent applications).

3. Which are the programmes that mainly support the creation of start-ups and spin-offs? What are their main characteristics?

A total of 16 RTDI programmes were found as dedicated to support the creation of start-up spin-offs companies with a high development potential. Those programmes were found in Belgium, Estonia, France, Greece, Latvia, Malta, the Netherlands, Slovenia and the UK. Even though their range of objectives is quite

widespread, those can be summarized as the following:

- Provision of seed-capital finance for high-risk start-up companies.
- Supporting the exploitation of patents with high potential commercial value.
- Supporting the implementation of innovative business and investment plans in order to favor the production of high added value new products and processes.
- Improving access to comprehensive business support, information and advice.

4. Are there National programmes which SMEs participation is larger than 60%?

MaPEeR SME reviewed and analysed more than 185 national / regional RTDI programmes (in EU27 plus BiH). By examining their differences and commonalities a typology was created based on the share of programme budget going to SMEs, the funding rates to SMEs and the thematic focus of the programmes. This typology consists of three main programme clusters, the 'SME-targeted' cluster, the 'open cluster' and the 'sectoral' cluster. Overall, there are many national programmes identified in all programme clusters that achieved high SME participation rate (of above 60%). For example, small-scale, but SME-friendly initiatives, like Innovation Voucher Programmes, as applied in 10 EU countries as well as the Dutch SBIR - Small Business Innovation Programme can be named as illustrative examples for this type of programmes.

In addition, PhD and Postdoc Research-Training Grants were found to support predominantly SMEs too, with the focus on improving the placement of young researchers into small firms. But also programmes in the sectoral cluster that show high SME participation rates, such as the ICT 2020 in Germany, SAPUSKA in the food sector in Finland as well as the programmes in the open cluster, such as the Business Link Programme dedicated to the start-up companies in the UK. More info on relevant programmes can be found on the MAPEERSME website (www.mapeer-sme.eu).

5. Are there any lessons to be learned from R&D programmes that have successfully attracted SME participation? How can those lessons be transferred to other programmes?

On the basis of the review of the 28 national reports, the RTDI programmes that had been assessed as the most SME-friendly across the EU-27 and Bosnia and Herzegovina were those:

- Focusing on the SME needs for concrete and short-term R&D results including support for the close-to-market phase.
- Providing personal counselling, mentoring and mediation to SMEs before and during the project by a key contact person (most often a project officer).
- Minimising /cutting red tape in terms of simplifying overall reporting and administrative requirements and adopting speedy assessment procedures.

With respect to transferability of good practices and lesson learnt the MaPEeR SME Final Comparative Analysis (www.mapeer-sme.eu) briefly summarises the MaPEeR SME Main Findings and key recommendations addressing in total five main categories, namely the:

- Programme design for SMEs.
- Programme administration and funding.

Knowledge Exchange Seminar Series 2014-15

- Broader financial issues.
- Knowledge and networks, guidance and awareness.
- New approaches in fostering research and innovation for SMEs.

Policy Recommendations from 100-panel of European SMEs and stakeholders (EU Experts Council)

The MAPEER SME project established a 100-member panel of European SMEs and stakeholders (EU Experts Council) that met four times to discuss and debates the problems, improveable issues and priorities for the design, implementation and management of SME-friendly R&D and innovation funding programmes. The outcome of this two-year effort were 27 independent recommendations on very specific topics; subsequently, these overall set of recommendations have been grouped into common concepts and topics for the sake of clarity, communication and better understanding, resulting in total of 15 Recommendations (MAPEER SME, 2013a). The following groups of recommendations were outlined:

- Recommendations related to programme design (**P.DESIGN**): improve the accessibility of programmes to SMEs by covering all sectors and sizes of SMEs, apply a demand-driven approach by focusing more on SME needs, develop measures to support access to market and faster commercialisation of R&D results;
- Recommendations related to programme implementation (**P.IMPLEMENT**) covering aspects as administration and funding: cutting red tape, simplifying reporting and administrative requirements, ensure transparent evaluation procedures, shorten time-to-contract and time-to-funding, and increase funding rates;
- Recommendations related to broader Exploitation and pre-commercialization of research results (**P.EXPLOITATION**), covering aspects as financial issues, improve access to risk finance, lower barriers on access to external funds / financing, increase tax incentives;
- Recommendations related to knowledge sharing and networking (**P.NET**): increase promotion and marketing of programmes; provide counselling, mentoring and assistance to SMEs before and during the project, create networks between industry and knowledge institutions.

Impact of High-Tech Innovation Research at Ulster University Business School

Our research has made a significant impact and influenced the innovation decision-making process across Europe in a number of tangible ways, including new policy programmes affecting EC innovation funding for HTSFs in Horizon 2020 and EU member states, as well as contributing to the European-wide adoption of novel high-tech innovations. A wide range of beneficiaries have been affected, including SMEs, SME support agencies, innovation development agencies, European Commission, European Parliament and international business alliances, as evidenced by factual statements from influential national and European stakeholders.

The international *reach* of European-wide HTSF policy recommendations has extended to the highest echelons of EC decision-making, including the European Commission and European Parliament. Policy developments targeting HTSF innovation adoption covered all EU member states. SMEs were extensively engaged through the creation of a 100-member European SME Experts Panel with the support of influential MEPs (MAPEER SME, 2013a), EC officials and EU innovation bodies such as Enterprise Europe Network, Eureka, Nessi and the European Network of Living Labs. A summary of the evidence of impacts and indicators is provided in Table 1.

Table 1: Enhancing Innovation in High-tech SMEs – Research Impacts

Key Research Areas	Impacts and Dates	Evidence	Impact Indicators

Knowledge Exchange Seminar Series 2014-15

<p>Influencing SME innovation funding policy in EC and all members states</p>	<ul style="list-style-type: none"> -15 EC-level HTSF innovation policy recommendations. - Identification of SME best practices for funding programme clusters -HTSF policies presented in European Parliament EC and EU innovation clusters -Creation of 100-member European SME Experts Panel 800+ SME engaged in policy development - EC endorse research impact -200+ SME policy programmes covering all of EU27 were benchmarked (2009-11) 	<ul style="list-style-type: none"> -Testimonials from MEP (1) and senior EC official (2) -Reports from EC (6) and to EC (7) -4 EC SME Experts Panel Meetings (7) -Endorsement from EC SME & Industry Associations (3,4,5) -30+ workshops held throughout EU27 (7) www.mapeer-sme.eu -Horizon 2020 affected by MAPEER SME recommendations including risk finance (loans), less administration, access for SMEs and public procurement (1,2) 	<ul style="list-style-type: none"> - Recommendations fed into Horizon 2020 (1,2) EC Green Paper ‘Common Strategic Framework’ and national innovation policy for all of EU 27. -Post-project SME support website www.mapeer-sme.eu -HTSF Innovation Conference accepted for ‘European SME Week’ attended by 100+ EC officials and SMEs www.mapeer-sme.eu/en/sme-conference -SME Risk Finance loans in Horizon 2020 (COSME) (1,2).
<p>Promoting high-tech innovation adoption in Europe</p>	<ul style="list-style-type: none"> High-tech innovation adoption in NI, Italy, Finland and Cyprus. -Invention of ‘Engage’ high-tech innovation. (2010-12) -‘Engage’ commissioned for two consultations for public and third sector (2012) -Engage invention used by an Italian regional government for eight public consultations (2012) -Healthcare technology assessment methods for UK and US Procurement (2008-12) 	<ul style="list-style-type: none"> -Parterre project website http://www.parterre-project.eu/ -‘Engage’ released under an open source licence. (10) -‘Engage’ software published on EC’s Open Source Join-up website. (10) -Improves decision-making in procurement process. (4) 	<ul style="list-style-type: none"> -PARTERRE selected by EC’s ePractice website as an exemplar innovation case study and awarded ‘Editors Choice’ for 2012 (9) -‘Engage’ used to support winning tender for eight regional government events in Italy (500+users) and two social economy policy events (160 users) in NI (3) -Validated by extensive engagement with UK and US healthcare regulatory bodies. (4)

The 15 major EC policy recommendations on the design, implementation of HTSF funding programmes and exploitation of innovation outputs (MAPEER SME, 2013a - pp.73-85), directly impacted beneficiaries such as the European Parliament, economic ministries in all EU member states, a range of HTSF clusters,

associations and networks. In addition, our HTSF innovation policy findings were fed into the development of Horizon 2020 and the EC Green Paper - *Common Strategic Framework* (<http://mapeer-sme.eu/news-and-events/news/2011/05/the-european-experts-panel-on-smes-and-research-contributed-to-the-green-paper-on-future-eu>). The key issues that were addressed in the HTSF innovation policy recommendations were how to remove barriers for HTSFs when designing and implementing HTSF funding programmes and practical ways to support HTSFs commercialise and exploit their results after the project lifecycle has expired. A senior EC official (DG Research European Commission) endorsed our policy recommendations, stating that they *'will greatly contribute to SME's special attention in FP8'* (MAPEER SME, 2013b). The adoption of our policy recommendations (MAPEER SME, 2013a, p82) contributed to the inclusion of new financial instruments benefitting SMEs proposed in early drafts of Horizon 2020 (see COSME in Table 1) that offers equity and loan guarantee facilities for SMEs. Another senior official at the EC (DG Research and Innovation) concluded that the research *"produced a number of significant and scientific reports that have benefit for EU and national policy makers, programme managers, SME organisations and associations, and SMEs.* In the final EC assessment report the EC further singled out the *'unique impact'* of the large-scale research reports on barriers which SMEs experience in getting involved in R&D and innovation funding initiatives at national and EU level and identified best practice elements amongst programme clusters, stating: *"This is a significant achievement as it is the first time that this information has been collected and analysed, allowing comparisons to be made between member states, and each country can compare its position with the EU average"*. For example, there have been considerable entry barriers for HTSFs in public procurement, and in our best practice reports we identified exemplar SME-focused HTSF funding policy programmes, such as the SBIR programme in Holland and the UK, that offer policy makers in depth instructions on how to replicate these programmes for widespread adoption (MAPEER SME, 2013a, p80).

The lowering of innovation barriers for HTSFs has greatly enhanced the international **impact** of this multidisciplinary high-tech innovation adoption research – leading to endorsement from the EC as a European exemplar of high-tech adoption, through its publication as a case study on the EC's prestigious 114,000 member *ePractice* website (ePractice, 2013). A spinout of this multidisciplinary research collaboration that also involved the Institution's School of Computing and Mathematics and School of Health Sciences was the development of the *'Engage'* innovation eParticipation software tool (JoinUp, 2013) This innovation was pivotal to ensuring eParticipation adoption in the UK market and was validated by end user acceptance of over 94% of 380 end users in eight consultation events, including an Open Data consultation for the UK Cabinet Office (ePractice, 2013). The *'Engage'* invention was released on an open source licence on the EC's *Joinup* open source website, which has dramatically increased the **reach** and benefits as the *Engage* software is free for everyone to use. The release of Engage under an open source licence has paved the way for wider adoption of the innovation in Europe, as Engage was used as the primary eParticipation technology in a winning tender by an Italian HTSF to conduct eight consultations for a regional government in Italy.

Ulster University Business School and Capacity Development of SMEs in NI

The Ulster University Business School has consolidated its longstanding commitment to the vitally important SME sector within the Northern Ireland economy by establishing the SME Development Centre. The SME Centre is headed by Kirsty McManus and was established to work with many small to medium-sized businesses, allowing them to move projects forward quickly by accessing a level of expertise that would otherwise be unachievable for a company their size. The SME Development Centre aims to help promote SME development in a number of tangible ways:

Innovate new ideas and products

Improve awareness of Innovation Vouchers that are available to small businesses in Northern Ireland and the Republic of Ireland. The vouchers enable businesses to access up to £4,000 /€5,000 of consultancy from University experts. Vouchers can be used for cashing in against Ulster University Business School's consultancy, design expertise, market research and technical support.

Knowledge Exchange Seminar Series 2014-15

Bespoke Management & Leadership

The Ulster University Business School is dedicated to providing world class executive leadership and management development programmes, informed by leading-edge research for business. Our programmes are designed to equip leaders and managers with the skills and experience they need to give their businesses a competitive edge. As a member of Harvard Business School's Microeconomics of Competitiveness Affiliate Network, and with links to the prestigious Babson College Boston, the School has established itself as a major centre for management and business education with international standing.

Consultancy

Consult our academics or academic teams and get the specialist information and advice you need, or commission them exclusively to carry out short studies.

Business Events & Networking

Throughout the year the SME Centre offers a number of high profile events and guest lectures which are aimed at increasing knowledge and skills within businesses in Northern Ireland helping you to develop your business network. Such events are often free to attend – a list of forthcoming events can be found at:

www.business.ulster.ac.uk/events/

Access exceptional talent

We have a wealth of talented students and graduates whose energy, knowledge and creativity will deliver real benefits to your organisation. SMEs can tap into this pool of talent through placements, graduate internships sponsorships and full-time recruitment. Hosting a project or placement student is an efficient way to staff short-term special projects, access the latest knowledge and enjoy the University's wider support. It is also an opportunity to help develop the next generation of professionals and along the way, identify potential future employees.

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Knowledge Exchange Seminar Series 2014-15

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