

Radical Innovation for the Enhancement of the Swedish Economy

*Final report
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The Radical Research Programme

This is the final report for the research programme ‘Radical Innovations for the Enhancement of Swedish society’, 2013-2015. Professor Maureen McKelvey is the principal investigator, with Evangelos Bourellos, Rick Middel and Olof Zaring each responsible for specific projects.

We, together with researchers involved, work at the Institute of Innovation and Entrepreneurship (IIE), Department of Economy and Society, School of Business, Economics and Law, University of Gothenburg (www.handels.gu.se/iie).

Our research program has addressed how and why firms, universities, NGOs and policy makers are able to stimulate radical change – and why they do not do so.

Our starting point was that Sweden needs a structural transformation for economic growth. Our focus has been on radical change. Our proposition was that such structural transformation is driven by developments in technology/science and markets, as through new business practices in companies and through entrepreneurship. However, how and why does this occur? And why has radical change proven difficult to implement for societies, organizations and individuals alike?

These changes are need for societal well-being and economic growth in Sweden in the future. Even though Sweden is acknowledged as an innovation leader, it is under threat from global trends, specifically the increase of market leadership as well as technical and business knowledge in companies in Asia.

The main aims of the project have been to:

- 1. Contribute to the international research frontier on innovation and entrepreneurship*
- 2. Interact with firms and practitioners on these issues*
- 3. Inform teaching practices within the area of innovation and entrepreneurship at GU*
- 4. Thereby, through the study, promotion, and encouraged dissemination of radical innovations, we will support the enhancement of Sweden's transformation to an innovation economy, through radical innovations*

Insights from work-packages in the Radical Research Programme

WPI: Business Model Innovation

Our research question in WPI addresses how companies can radically renew their offerings of products and services by innovating around their business model. For example, Volvo Cars no longer only sell cars and financing, but also the service of delivery of food to a car. We focus upon helping change within companies, as well as understanding these processes.

Our research has focused upon the concept of 'legitimization'. Even genuinely novel ideas that revolutionized our understanding have to be legitimated when they are first introduced in a company. By legitimization, we mean the acceptance of new ideas by established persons and culture/norms. Because the value or correctness of innovative ideas rarely can be objectively measured or analyzed, until late in the process, the perceived legitimacy within the organization becomes an important criteria for evaluating and deciding which radical innovation is further developed.

Our research results are interesting because they answer questions about how an individual would go about creating legitimacy for the business model innovation ideas. What would they do? What actions would they take? Our results indicate four different type of actions that individual take in order to build legitimacy in a company: Conform to the environment; Select among environments to find a more favorable one; Manipulate environments; Be passionate/building collective support, by mobilizing colleagues inside the firm.

- Assistant Professor Rick Middel has been project leader for WP I on Business Model Innovation. The research has primarily involved Master's students, who both work in short-term projects and in Masters Theses at companies as well as action research processes within large Swedish multinational companies.

WP II: Universities and Entrepreneurship

Our research question in WP II addresses how and why universities do, or do not, stimulate radical change in society through research and education.

One starting point is that universities may play a conservative role, in being a repository of knowledge, and they might help society to change, in developing and diffusing new knowledge. Our research has focused on three roles that universities play: 1) utilizing highly specialized employees (human capital) which may engage in interaction with industry; 2) educating students who later use that knowledge and techniques to change society; 3) producing research results may also promote radical changes.

Our results suggest that leading edge engineering research in Sweden has close contacts with large companies, thereby developing national capabilities in fields as diverse as functional food and medical devices. Network relationships between industry and universities remain strong over time because even after a 'commercialization' event like starting a company, additional scientific research is often needed. Entrepreneurship from universities thus relies upon finding business partners for commercialization. Similarly, creative industries like music depend

upon key individuals. Finally, an overview of entrepreneurship education in Sweden suggests that a wide range of courses are currently being run, and our classification has identified clear trade-offs between too theoretical and too practice based approaches to teaching entrepreneurship.

- Professor Maureen McKelvey has been project leader, for WP II on Universities and Entrepreneurship. Researchers involved from IIE include: Post-doctoral scholar Evangelos Bourellos, Lecturer Johan Brink, Assistant professor Daniel Ljungberg, Associate Professor Rögnvaldur Saemundsson, and Associate Professor Olof Zaring. Collaborating researchers elsewhere include Ann Veiderpass (GU), Magnus Holmén (Chalmers, now Halmstad university), and Jens Laage-Hellman (Chalmers) and as of 2015, Albinsson's research is also financed by the Broman Foundation. PhD students involved include Ethan Gifford and PhD student Erik Gustafsson as well as Master's students.

WP III: Emerging Technologies: Science and Technology in Relation to Entrepreneurship

Our research question in WP III focuses upon the emergence of technological and scientific fields, which lead to new scientific fields as well as new industries and radically types of products in existing companies. Analysis has focused upon empirical areas of nanotechnology and medical innovations.

Our research has demonstrated that top researchers in studied fields are also often the ones who take patents, and at a late stage in their career. Moreover, a high proportion of total academic patents in Sweden are related to nanotechnology. For individuals, a remarkable performance in patents goes hand in hand with academic excellence. Finally, in these knowledge intensive fields, excellence is highly dependent on few individual researchers and/or organizations, which in turn stimulate a research environment.

Our research results are interesting because they suggest that research and industrial invention (or third mission) are complementary activities. They thus help to provide empirical evidence about the relationship between science and technology in rapidly emerging fields. These empirical results can also be used by policy makers, universities and industrial actors in order to accelerate entrepreneurship in the context of emerging technologies.

- Post-doctoral scholar Evangelos Bourellos has been project leader, for WP III on Emerging Technologies: Science and Technology in Relation to Entrepreneurship. Researchers from IIE include: Professor Maureen McKelvey. Bourellos's research is financed by the Broman Foundation, through a post-doc scholarship. Collaborating researchers elsewhere include Berna Beyhan (Bahcesehir University, Turkey), Jun Jin (Zhejiang University, China), and Bastian Rake (University of Passau, Germany). PhD students involved include Ida Hermanson and PhD student Ethan Gifford as well as Master's students.

WP IV: Public Policy: Governance of Regions in a Globalized World

Our research question in WP IV focuses on how public policy stimulates radical change – as well as suggest why it sometimes fail to do so (despite such goals).

Our project has led to a new conceptualization about how and why public and private actors collaborate to develop regions. By this, we mean how and why public policy that stimulates interaction and capacity building within regions. The theoretical concept is ‘governance’. Governance here means that different organizations can collaborate around scientific and technological knowledge, based on common norms. This leads to a regional capability around knowledge – shared by companies, universities, public policy, NGOs, etc. – which helps companies compete.

Our research results are interesting, in that we have analyzed the role of Asia as well as Sweden’s position in the global innovation economy. Collaboration is one way to counterbalance globalization – but sometimes it works well and sometimes it does not. These results help explain when regional linkages to develop knowledge and social capital have positive or else neutral impacts in relation to developing technical specialties.

- Associate Professor Olof Zaring has been project leader, for WP IV on Public Policy: Regions in a Globalized World. Researchers from IIE include: Assistant Professor Daniel Ljungberg, Post-doctoral researcher Evangelos Bourellos, and Professor Maureen McKelvey. Collaborating researchers elsewhere include Sharmistha Bagchi-Sen (GU and State University of New York, Buffalo), Rani Dang (Nice, France and IIE/GU), and Stefan Szücs (GU). PhD students involved include Ida Hermanson and Snöfrid Herou Börjesson as well as Master’s students.

WP V: Venture Creation: Pre-incubation projects for Master’s students

This work-package has been focused on developing a pre-incubation process for our Masters students. By pre-incubation, we mean a series of courses where they work with one or more project, to test how to become entrepreneurs. We now work together with GU Ventures, which provide a series of relevant projects (with external idea providers) as well as coaching. GU Ventures involvement in this education is, in turn, supported by VGR.

Our focus is upon student learning in entrepreneurship. This work-package has been vital in developing education, which combines theoretical understanding from modern research, with practical projects. Some courses are designed with modules, to ensure that students learn a range of techniques. Some courses are designed as process, which force the student to continually confront how they interpret the projects, trying out more systematic analysis of the scientific and market opportunities.

After completing our education, students are well prepared to become entrepreneurs or else work within organizations supporting entrepreneurship (like Venture Cup and Incubators). Our entrepreneurship students write their Master’s thesis in relation to this work-package. Moreover, the Masters students were able to take study visits abroad – Amsterdam in 2014 and Berlin in 2015.

Finally, we would like to point out that this work-package has been directly supported Master's students in 'Knowledge-based Entrepreneurship'.

At the same time, research results, case studies, as well as interactions with companies and policy makers as a result of the whole research program have also impacting teaching in the Masters in 'Innovation and Industrial Management'.

- Professor Maureen McKelvey has been project leader for WP V: Venture Creation. Professor McKelvey is also Program Director for our MSc in Entrepreneurship (KBE). Persons involved include Anders Nilsson (business coach) as well as the teachers Evangelos Bourellos, Johan Brink, and Rögnvaldur Saemundsson. PhD students involved include Karin Berg and Linus Brunnström.