研究・イノベーション学会　国際ワークショップ

How do governments encourage innovation from the R&D they support? An International Perspective

政府はいかに研究開発の支援によりイノベーションを興せるか：海外の事例を参考に

要旨

本学会の「新な活動検討委員会」ではいくつかのワーキンググループを設置し、学会の活性化方策を検討してきた。とりわけ、学会としての国際化は重要な課題と考えている。そのため、主要国の政策立案者およびこの分野の専門家をお招きし、主要国におけるイノベーション政策について議論する国際ワークショップを開催する。基調講演、ならびにパネルディスカッションを通じ、スウェーデン、日本、英国、米国、ドイツ等の事例を踏まえて議論する。

開催概要

- 日時　平成 29 年 7 月 27 日（木） 18:00-20:35（受付開始：17:30）
- 会場　東京工業大学 田町キャンパス CIC 1 階 国際会議室

プログラム

- 18:00 開会挨拶 宮崎久美子 東京工業大学 教授
- 18:05 基調講演 “National Innovation Policy vis-à-vis Global Firms: a Tentative Research Agenda” 「グローバル企業に関わる国家的イノベーション政策～スウェーデンの課題」Lennart Stenberg, Senior Advisor, Vinnova （逐次通訳あり）
- 18:45 - 20:30 パネルディスカッション “Government policy on innovation from the science and technology base supported by public funds” 「公的資金によってサポートされる科学技術基盤による政府のイノベーション政策」（モデレータ：宮崎久美子 東京工業大学 教授）
- 18:50 - 19:05 Michael Norton, 東京工業大学 特任教授
- 19:05 - 19:20 Lennart Stenberg, Senior Advisor, Vinnova
- 19:20 - 19:35 関口智嗣 産業技術総合研究所（AIST) 理事
- 19:35 - 19:50 Patarapong Intarakumnerd, 政策研究大学大学院（GRIPS） 教授
- 19:50 - 20:20 質疑応答
- 20:20 - 20:30 主な論点の整理 林 隆之 大学改革支援・学位授与機構 教授
- 20:30 閉会挨拶 井川 康夫 北陸先端科学技術大学院大学 名誉教授

Keynote Presentation

National innovation policy vis-à-vis global firms – a tentative research agenda

Mr Lennart Stenberg
Vinnova, Sweden

To a large and increasing extent innovative firms are integrated into global corporate structures, global value chains and global knowledge and innovation networks. This is no longer the case only for large firms but even many young firms need to develop a global presence early. It appears that one effect of the growing global reach of firms' operations and linkages is that the spatial distribution of the value created directly and indirectly through a firm's operations can change faster and more drastically than in the past. This in turn has created a certain policy competition among countries for the location of high value added activities. It will be argued that this creates special policy challenges for a peripherally located country with a small domestic market such as Sweden and, in particular, for policies aimed at securing renewal of industry. Increasingly, similar pressures are likely will be felt also in larger economies

Under these circumstances two fundamental questions need to be answered as a basis for the development of national research and innovation policy:

- What is the actual and potential (direct and indirect) contribution of various types of global firms to value creation in the country?
- What is the actual and potential contribution of the national research and innovation system to the development of the respective global firm? How and to what extent can policy influence where global firms invest in renewal?

In the presentation, these questions will be developed further with special reference to the case of Sweden. The main features of the globalization of Swedish industry during the last 30 years will be reviewed and problems and opportunities for Sweden created through this process will be highlighted. The global nature of innovation activities will be illustrated for a couple of firms with large R&D-activities in Sweden.

Limitations in our knowledge about the role of global firms in the Swedish innovation system and about the position of firms in Sweden in their global context will be discussed and high priority research questions suggested. Examples of past, ongoing and planned research activities aimed at filling these knowledge gaps will be presented, including work funded externally or performed internally by Vinnova. An area of great importance concerns the interplay between large global firms and young and small knowledge-intensive firms which may occur through, for example, mobility of people, spin-offs of new firms from large firms and acquisition of small firms by large business groups.

While there is currently no cohesive innovation policy in Sweden aimed explicitly at global firms, policies which appear particularly relevant for where such firms invest in renewal will be discussed applying an evolutionary perspective on policy learning and development, including the most recent government initiative, the Strategic Innovation Partnerships.

Panel Presentations

The Role of Research Institutes for Supporting Innovation in Industry Gaining Interest in Sweden

Mr Lennart Stenberg
Vinnova, Sweden

Sweden is rather unique among industrialized countries in the small share of government R&D-funding going to research institutes. This is the result of a very conscious policy to concentrate government funding of research to universities which was adopted immediately following the end of the World War II. While this policy has become increasingly pronounced over the decades, during the last ten years a recognition has gradually emerged that institutes, and more specifically the so called industrial research institutes, may have an important role to play in the Swedish innovation system and that they need to be strengthened.

What has happened is that the basic government funding of the industrial research institutes has been increased, although it still remains miniscule compared to the basic funding of universities. Maybe even more significantly, a restructuring of the industrial research institutes has taken place in a step-wise process which still is underway. A large number of fairly small institutes have been consolidated into an integrated system of institutes with a common management and governing board. This is expected to allow a regrouping of the existing research capacity as well as strategic investments in the development of new areas and selective strengthening of existing research. Whether the regrouping and strategic investments will be successfully implemented remains to be seen. Here it would be interesting to learn from the experiences of the AIST and NIMS after their "reestablishment" in 2001.

For historical reasons the ownership of the industrial research institutes has been complex and a barrier to structural change. In the most recent move the ownership of the consolidated institute group has been simplified and transferred to the government.

While the financing picture differs between areas, industry is in most cases the largest source of income. Participation in collaborative projects, partly funded by the government or the European Commission, is also a significant source of financing. As government R&D-funding during the last five years has moved towards more complex projects and programs the institutes' role as a competent and neutral platform and organizer of complex collaborative activities has emerged as a distinct strength.

The precise role of the research institutes has yet to be clearly articulated. This is of course not unique to Sweden and one may in fact ask why it has been so hard to define the role of research institutes in most countries? Some of the changes in scientific basis for industrial innovation has, at least in Sweden, affected the roles of universities and institutes in strategic collaborative research with industry. There is reason to believe that the industrial research institutes need to strengthen their access to cutting-edge scientific research competences and that this will require closer co-operation with universities.

Some experience from the UK on encouraging innovation

Prof Dr Michael Norton
Tokyo Institute of Technology, Japan

The UK has a long history of trying different approaches to its innovation policy so I will briefly describe some of the stages and comment on their effectiveness.

Firstly the UK, and other industrialised countries, have had to recognise a substantial erosion in their manufacturing competitiveness over the last 50 years. Indeed, Japan in the 1960s and 70s was one of the first early drivers of this process -later to be taken over by China and other developing countries. Previously world leading countries have seen entire industries disappear and move offshore in this way. Inability to compete on the basis of wages or (in the case of competition from Japan) continuous

technological improvement and reliability, often turn the spotlight to innovation as the way of maintaining GDP and high standards of living. In the UK government's own words "Countries at the forefront of research and innovation will be best placed to move into high value-added, technology-driven areas, which can provide new sources of growth".

But innovation of economic value takes places in companies, not government, so there is the question about what can government actually do to support and stimulate innovation? This has led to a range of approaches with different degrees and style of government intervention. At one end was the idea of the state-funded technology development which would protect promising science and technology ideas from the early pressures of economic viability, and hopefully take a new technology through to the point where it could be taken over by the private sector. In the UK, both nuclear power and early aircraft were developed under this model. But such state-initiated projects had many failures and are no longer fashionable. Instead, attention has turned to the National Innovation System (a concept first developed by UK social scientists) to try and identify more surgical interventions which can speed up the innovation and increase its success rate. This system is not just basic research and development, but also many factors which influence the take-up of new knowledge by companies-including intellectual property, technology transfer finance, skills, and attitudes.

The UK completed a major review of these innovation options in 2004 and came out with a 7 point plan to increase the input of its basic R&D funding to the innovation system, and overcome some of the perceived barriers. This has included thematic programmes on sectors which are judged to have major market or social potential. Knowledge transfer networks. Innovation platforms which are potentially generic technologies on which important industrial sectors will depend in the future. And technology and innovation centres established round leading universities.

I will provide more detail on these and also some of the more interesting recent results of studies on the origins of successful innovation clusters such as Cambridge, which call into question some of the previous innovation thinking- in particular focusing on the complexity of the process and the critical role of people- particularly entrepreneurs.

Role of Public Research Institutes in Supporting the Industry in Industrialized Countries: The Cases of Fraunhofer, NIST, CSIRO, AIST, and ITRI

Prof Dr Patarapong Intarakumnerd
National Graduate Institute for Policy Studies (GRIPS), Japan

From the studies of five leading public research institutes in industrialised countries, interesting findings can be presented.

Firstly, roles of PRIs should fit the nature and level of development of national innovation systems where they are operating.

Secondly, as technological options become riskier and more uncertain, and the nature of innovation is more open, 'intermediary' roles of PRIs are even more important.

Thirdly, regarding mode of interaction with industry, unlike conventional wisdom, patent-based licensing is much less important than contract research. Remarkably, an informal mode like *mobility of researcher*s, *engineers and managers* is not only effective way of promoting knowledge exchange but also in mitigating network failures and establishing and strengthening relationship based on trust and longer-term benefits between PRIs and industry.

Lastly, geographical operation matters and it is linked to the issue of PRIs being knowledge hubs of local and national innovation system.

The speaker will describe the roles of the five PRIs in the above aspects. Specifically, he will highlight experiences of Fraunholfer and ITRI in applying specific modes of interaction with the industry, namely, contract research, co-location, spin-off, human mobility and R&D consortium.

Biography of the Keynote Lecturer and Panelists

Mr Lennart Stenberg
Vinnova, Sweden

Mr Stenberg is a senior advisor, international R&D-cooperation and analysis, at VINNOVA (Swedish Governmental Agency for Innovation Systems), Stockholm, since 2004. Science and technology counselor at the Swedish Embassy in Tokyo 1998-2003; MSc in Engineering Physics from Lund University in 1969; Worked with development of research and innovation policy and related analysis at STU and NUTEK, two predecessors to VINNOVA, for most of the period 1971-1997 interspersed with research, e.g. at MIT System Dynamics Group (1972-1974), Resource Policy Group in Oslo (1974-1977), Research Policy Institute at Lund University (1988-1990, part time), and University of Tokyo (1990). Since 2004, visiting researcher (part time) at University of Tokyo. Main current research interests concern the role of national research and innovation policies in an era when innovation largely takes place in global networks of companies and research organizations.

Prof Dr Michael Norton
Tokyo Institute of Technology, Japan

Prof Norton obtained his BSc and PhD degrees in chemistry at Bristol University. He was a research chemist at Imperial Chemical Industries (1970-74), and then joined the UK government science service. After 8 years working on environmental pollution, he spent 4 years in the USA as Science Attache, specialising in environment and biosciences. He returned to the UK in 1986 to direct a biotechnology research group in a National Laboratory, in 1989 was invited to establish the Parliamentary Office of Science and Technology. He set up the new organisation, developed its advisory services and oversaw its adoption as a formal part of the UK Parliament (1989-1998). From 1998 to 2004, he was Counsellor for Science and Innovation at the British embassy in Tokyo and promoted UK-Japan collaboration in S&T – particularly in environmental sciences and sustainability. He then took up a position as Professor at Tokyo Institute of Technology in the fields of innovation and sustainable development (2004-6). From April 2006 he became a Professor at the Innovation Management Institute at Shinshu University specializing in innovation clusters, and environmental sustainability. In 2012 he moved to Tohoku University as a Professor in the Environmental Leader programme, before returning to Tokyo Institute of Technology in 2015 where he is Adjunct (Special) Professor in the School of Transdisciplinary Science and Engineering.

Prof Dr Patarapong Intarakumnerd
National Graduate Institute for Policy Studies (GRIPS), Japan

Prof Patarapong is now at National Graduate Research Institute for Policy Studies (GRIPS) in Tokyo, Japan. He is teaching Master and Ph.D. programs and conducting research in the area of economics of innovation and innovation policies. He received B.A. degree in Economics (English Programme) from Thammasat University, Thailand in 1993 with first class honour, the M.Phil. degree in Economics and Politics of Development from Cambridge University, UK in 1994, and D.Phil. degree in Science and Technology Policy Studies from Science Policy Research Unit (SPRU), University of Sussex, UK in 2000.

Dr Satoshi Sekiguchi
Advanced Industrial Science and Technology (AIST), Japan

Dr Sekiguchi is currently Vice President of the National Institute of Advanced Industrial Science and Technology (AIST) in Japan, and is appointed the Director General of the Department of Information Technology and Human Factors, which is engaged to perform a research on developing a sound society by specifically addressing the mutual interaction of informatics and ergonomics. He has continued to drive major developments in high-performance computing widely from its system architecture to applications. His expertise also includes applying IT-based solutions to many of society's problems related to global climate change, environmental management and resource efficiency. He received his BSc. from the University of Tokyo, M Eng from University of Tsukuba, and PhD in Information Science and Technology from the University of Tokyo, respectively. He joined Electrotechnical Laboratory (ETL) where he started his professional carrier as research scientist in 1984. In 2002-2008 he served as the founding director of Grid Technology Research Center, followed by the Director of Information Technology Research Institute, AIST in 2008-2012, and the Deputy Director-General of the Directorate for Information Technology and Electronics in 2012-2014, He is a member of Science Council Japan, IEEE CS and ACM, and IPSJ fellow.