

CEMI letter 2005

Foreword

2005 was the first full year of operation for the Chair of Economics and Management of Innovation (CEMI), a research unit of the College of Management of Technology (CDM) at EPFL. It was a year devoted to capacity building, expansion into new areas of investigation and some international networking.

Our research group specializes in the fields of economics of science, technology and innovation, with a strong focus on applied microeconomics and evidence-based policy research. As part of the EPFL, our group is in a privileged position to track the spillovers generated from the interactions between the academia and the private sector.

The research group activities also involve "CEMI friends" such as Iain Cockburn (Boston University), Bronwyn Hall (Berkeley University), Rebecca Henderson (MIT), Francesco Lissoni (Bocconi University), Jacques Mairesse (ENSAE), Richard Nelson (Columbia University), Geoffrey Rothwell (Stanford University), Eric von Hippel (MIT) and Georg von Krogh (University of St. Gallen), to name a few, who are engaged in one or more projects of the research center.

To date our research group is close to its critical mass with five PhD students, a post-doc, a senior scientist, a scientific coordinator and a secretary.

I really hope that CEMI's research activities will provide opportunities to meet and interact with you in 2006.



Dominique Foray

Research operations

Economics of science and technology commercialization

ExTra

This research project aims to explore the various channels through which knowledge is transferred from EPFL. Scientific publications, patents, cooperations, creation of start-ups and human mobility are the main channels and systematic data at the individual and laboratory levels are collected with the help of the EPFL administration.

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Start-ups

One of our ExTra activities deals with EPFL start-ups. A qualitative study of knowledge and technology transfer was conducted at STI, the EPFL's engineering faculty, consisting of a series of more than 20 in-depth interviews with professors, universities administrators and technology transfer officers. The focus was on professors' motivation to engage in technology transfer, and the interplay of the various transfer mechanisms and the institutional specificities of EPFL. The study was designed to inform and support the implementation of the quantitative projects of ExTra. One particular aspect of ExTra is the commercialization strategies that led to start-up companies, and how these are related to the formal and informal structures at EPFL.

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User innovation and informal innovation

The aim of this project is to investigate informal innovation activities that take place within firms. In relation to this, it needs to be explored to what extent "users of technology" – that can be both external and internal to the firm – contribute to this process. At this stage, we are in the course of setting up case studies that will help to explore these issues in more detail and to develop more precise measures for these activities and their impact. Similar projects are run in parallel by G. von Krogh and E. von Hippel. The research is supported by the Swiss National Science Foundation.

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Measuring knowledge spillovers

The project aims at elaborating a novel methodological framework for evaluation of global R&D programs in the energy sector. More specifically, “spillover” effects of the research, development, demonstration, and deployment of Fusion and Generation IV Nuclear Fission technologies are being investigated, and the social rates of return of respective R&D programs are being assessed using an integrated energy system and macroeconomic model.

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Regional and national policies in the knowledge economy

The objective of this research is to compare the Swiss situation in Science and Technology (S&T) to other countries focusing especially on the EU. The analysis deals with three aspects that are to be considered in a knowledge economy: the knowledge infrastructure, the innovation capacity and the ability to capture the economic benefits of these innovations. S&T policy issues are also addressed. A report on “The place of Switzerland in a globalized economics of knowledge” has been prepared for the “Federal Office for Professional Education and Technology” (OFFT) and the “State Secretariat for Education and Research” (SER). The authors – D. Foray and S. Lhuillery – show with different kinds of indicators (including new ones) that Switzerland is clearly embracing the knowledge economy despite the presence of hampering factors in each of the three mentioned stages.

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Knowledge for development

This research examines whether the introduction and gradual strengthening of intellectual property rights changes the allocation of entrepreneurial activities in newly industrializing countries. Empirical analyses will be conducted to test for the effect of IPR on these countries, based on available IP database collected at the EPO, USPTO, JPO and national patent offices. The results of this research will offer some insights of the potential impact of TRIPS on developing countries.

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PhD and post-doc research projects

“Spillover benefits and social rate of return of global R&D programs in energy sector: Case of “Generation IV” nuclear fission and fusion power generation technologies” (D. Bednyagin)

“On the conditions, processes and impact of informal innovation in business firms” (M. Bogers)

“Research contracts as a means of interaction between university and industry: Analysis of the conditions that

ensure contract efficiency” (A. Conti)

“Research tools and vertical disintegration in biomedical research” (P. Gaulé)

“IPR and entrepreneurial activities in developing countries – a structural payoff approach” (I. Hamdan)

“The origins of high-technology start-up companies at EPFL” (C. Zellner)

“Multitasking in an academic environment: Understanding and modelling the dynamics underlying a reconciliation of teaching, research and entrepreneurial activities.”

(J. Callaert – visiting PhD student from K.U. Leuven, Belgium)

CEMI events

Workshops

April 8th / 9th

“Randomized evaluation in a non-routinized environment: New perspectives on R&D in education and other social sectors”

with the participation of A. Gelijns, R. Murnane, R. Nelson, L. Orsenigo, N. Rosenberg, J. Mairesse, T. Cook, and others.

This workshop addressed the issue of the uneven development of human know-how in various sectors with a particular emphasis on education and medicine. The event brought together educational researchers, researchers familiar with innovation in medicine and the role of randomized controlled trials, and economists interested broadly in differences across sectors in the rates of progress and the factors behind these differences. A special issue of “Economics of Innovation and New Technology” including a selection of papers presented at the workshop is forthcoming.

CEMI was proud to host Professors Richard Nelson (left) and Nathan Rosenberg (right) for the first academic event of its young history.



September 29th / October 1st

1st ExTra Workshop on "University-industry knowledge transfer instruments: Scientific publications and patents"

with the participation of A. Agrawal, I. Cockburn, J. Furman, B. Hall, R. Henderson, F. Lissoni, P. Llerena, J. Mairesse, F. Murray, B. Sampat, R. Veugelers, and others.



Supported by the Swiss National Science Foundation, this workshop was the first of a series of workshops CEMI is organising in the field of the economics of knowledge production and distribution. It got together the best internationally recognized economists working on the topic of university-industry research partnerships in the knowledge economy, both at empirical and theoretical levels.

The Vice-President for Innovation and Valorisation at EPFL, Prof. J.-A. Manson, opened the workshop with a general overview of the institution and a presentation of the Innovation Network – a new way to encourage an entrepreneurial mindset among EPFL students and to provide them with a network of competences and grants.

The rest of the time was devoted to presentation and discussion of recent quantitative works aimed at tracing and describing knowledge flows between universities and the rest of the economy. The workshop allowed American and European researchers to confront their works, discuss the empirical methods, compare the results and exchange about the problem of access to individual data.

The workshop turned out to be a very enriching experience for our academic group as well as for the technology transfer managers who attended the meeting.

Seminars

May 2nd – Eric von Hippel

"Democratizing innovation"

June 15th – Paula E. Stephan

"Capturing knowledge: The location decision of new PhDs working in industry"

October 13th – Réjean Landry

"Knowledge transfer"

December 5th – Geoffrey S. Rothwell

"Developing a framework for assessing spillovers among multiple nuclear energy system R&D programs"

Main conference contributions

January 10th/11th - D. Foray

Opening speech

Conference on "Advancing Knowledge and the Knowledge Economy", National Academies, Washington DC, USA

March 9th - D. Foray

"Research infrastructures in the knowledge-based economy"

Meeting on "The need of industry for research infrastructures", The European Commission, DG Research, Brussels, Belgium.

April 27th - D. Foray

"The art of designing incentives' systems for 21st century innovations"

Innovation Europe Summit 05, Katholieke Universiteit Leuven and IBM, Leuven, Belgium.

June 27th/28th - M. Bogers

"Improving measurement of user innovation conducted by firms"

"International User Innovation Workshop" MIT, Cambridge (MA), USA.

September 26th/27th - C. Zellner

"Exploring the economic impact of science: The foundation of high-tech start-up companies at EPFL"

World Bank-CMI Conference on "University-Industry Linkages in Europe and North America" Cambridge, UK.

October 6th/7th - S. Lhuillery

"An academic (and personal) perspective on policy challenges"

Second workshop on "Indicators in the Knowledge Economy", Maastricht, The Netherlands.

October 28th/30th - M. Bogers

"Measuring informal innovation: The contribution of "on-line" activities to the innovation process"

Conference on "Economic Use of Technology and Science", Oslo, Norway.

Main publications

Working papers

Lhuillery, S., *Organization and location of academic sourcing at the firm level*.

Witt, U. and C. Zellner, *Knowledge-based entrepreneurship : The organizational side of technology commercialization*.

Edited books and Special issues

Fornahl, D., C. Zellner and D. B. Audretsch, *The role of labor mobility and informal networks for knowledge transfer*, Dordrecht: Springer.

Vang-Lauridsen, J. B. and C. Zellner, *Innovation in services, industry and innovation* (special issue), vol.12, n.2.

Papers in academic journals

Lhuillery, S. and C. Carpentier, "Firmes biotech indépendantes et dépôts de brevets: Une exploration économétrique", numéro spécial sur les biotechnologies, *Education et Formation*.

Lhuillery, S., "Voluntary technological disclosure as an efficient knowledge management device: An empirical study", special issue on "Empirical studies of innovation in the knowledge driven economy", Guest editors: B. H. Hall and J. Mairesse, *Economics of Innovation and New Technology*.

Chapters in books

Cowan, R., P. A. David and D. Foray, "The explicit economics of knowledge codification and tacitness", in G. Dosi, D. J. Teece and J. Chytry (eds.), *Understanding industrial and corporate change*, Oxford University Press.

Foray, D., "New models of innovation and the role of information technologies in the knowledge economy", in W. H. Dutton, B. Kahin, R. O'Callaghan and A. W. Wyckoff (eds.), *Transforming enterprise: The economic and social implications of information technology*, The MIT Press.

Lhuillery, S., "The research and development tax incentives: A comparative analysis of various national mechanisms", in P. Llerena and M. Matt (eds.), *Technology policy in theory and practice*, Springer Verlag.

Report

Foray, D. and S. Lhuillery, "La Suisse dans l'économie globalisée de la connaissance", prepared for the "Federal Office for Professional Education and Technology" (OFFT) and the "State Secretariat for Education and Research" (SER).

Foray, D. and S. Lhuillery, "La région métropolitaine lémanique: Une région apprenante dans le tournoi mondial de localisation" prepared for "Avenir Suisse".

Policy advice

D. Foray is member of the expert group "Knowledge for growth" – a group of economists established by the European Commissioner for Research, J. Potocnik.

The Team

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Visiting PhD candidate:

Scientific coordinator:

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From left to right: Patrick Gaulé, Denis Bednyagin, Christian Zellner, Marcel Bogers, Dominique Foray, Stéphane Lhuillery, Tea Danelutti, Marianne Cachin, Annamaria Conti, Intan Hamdan.

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