

CEMI letter 2009

Foreword

2009 was a transition year for CEMI, since its creation in 2004. Our first PhD students finished their dissertation work, all brilliantly passed their thesis defenses and left. Marcel Bogers, Anna Maria Conti and Patrick Gaulé are now at, respectively, the University of Southern Denmark, Georgiatech and MIT as postdocs, while Intan Hamdan Livramento launched a start-up «Intelligent Strategy», specializing in the empirical analysis of innovation and trade problems on a global scale. Abraham Garcia Torres, a postdoc with us, is now at the IPTS (Sevilla). CEMI is proud of these trajectories, and will follow closely the evolution of its first start-up ! At the same time, new faces have appeared, which you will discover in this letter. Their new research projects bring a welcome renewal to the issues, while extending our tradition of applied microeconomics of innovation.

Without a doubt, this line of research has never been more relevant and timely, as the great global challenges are combined with the economic crisis, giving innovation a central role in strategies to recover from the crisis at the national level and to manage the business cycle for firms.

More than ever, the knowledge and empirical comprehension of the microeconomic determinants of innovation and its effects are essential to the management of our societies and their progression in terms of growth, development and wellbeing. Thus, our results - for example through our Intellectual Property Right index based on the WTO Trade-Related Aspects of Intellectual Property Rights agreement for 53 developing countries, or our survey on the Offices of Technology Transfer in Europe, or finally by our methods of statistical analysis of the nanotechnology clusters - will attract the attention of our readers. They are also all available on our webpage : <http://cemi.epfl.ch>.

CEMI has also evolved in terms of administrative staff. Tea Danelutti and Marianne Cachin changed affiliation within the CDM, while Jennifer Katzung has joined for the secretariat. Best wishes to those who have left and welcome to those who have joined us !



Prof. Dominique Foray
 Director of CEMI



Project and Research results

Topic 1 - R & D and Innovation Economics and Policy

Measuring smart specialization

Dominique Foray, Julio Raffo

Addressing the issue of specialisation in R&D and innovation is particularly crucial for regions/countries which are not at the frontier in terms of science and technology. A promising strategy appears to be to encourage investment in programs that will complement the country's other productive assets to create future domestic capability and interregional comparative advantage. We have termed this strategy "smart specialisation." Our current project involves a pilot study based on existing statistics to demonstrate that smart specialization is measurable and that aggregate statistics can be produced.

Partners : P.A.David, B.Hall, J.Larosse and G.Licht, OECD

Structuring a policy response to Grand Challenges (international seminar)

Dominique Foray

As entering the era of crises and grand challenges - climate change, food, water, and health, this is a good timing for revisiting the old "mission-oriented policy" rationale and design. The central question that the Seminar will address is how to increase some kind of command-control on the direction of innovation while not attempting to impose predefined technologies, freezing or petrifying competition and finally dissipating the extraordinary power of a free market economy in boosting large numbers of experiments in a decentralized way.

Partners : D.C.Mowery and R.R. Nelson, Research Policy
 Support: Swissnex, Swiss National Science Foundation (FNS)

Innovation in public services: a cure to the Baumol's disease?

Dominique Foray, Stéphane Lhuillery, Julio Raffo

Many years ago, William J. Baumol introduced an interesting distinction between the so called "progressive" and "non-progressive" sectors within the economy. Non-progressive sectors - essentially services - involve the sectors in which productivity growth is limited, very sporadic and far smaller in magnitude than what is happening in the progressive part of the economy (manufacturing). Our starting hypothesis is that the place of any particular activity in the classification is not only a manifestation of the activity's technological structure as a sort of exogenous condition; it is also the result of a lot of drivers ranging from the history of firms, organizations and innovation capacities in a particular sector of a particular country to proactive policy programs trying to address specific issues within the non-progressive sectors. Our main objective is therefore to identify the micro-foundations of the transitions towards the progressive part of the economy.

We develop case studies on :

-the emergence and development of an industry for instructional technologies

-the impact of medical technology diffusion on health care costs.
Partners : J.Hartwig, J.E.Sturm (KOF/ETHZ), B.Hall, K. Lamiraud (UNIL & ESSEC)

FNS Grant n° 100014-122610

Research proposal submitted to the FNS

The impact of public funding to R&D (PhDs research project)

Marianna Marino, Stéphane Lhuillery

Policy-makers and economists are highly concerned about the importance of robust evaluations about the welfare effect of R&D policies. This research addresses the issue of effectiveness of public funding in continuous treatment scheme. In fact, treatment regimes typically are not binary and firms are exposed to diverse levels or doses of treatment. More in detail, the present study evaluates the impact of public R&D support by using the generalized propensity score method for continuous treatments effect evaluation. That allows us to estimate the marginal treatment effect of a specific contribution level, comparing the outcome of units that have received such specific amount of fund with respect to units that have received another one (counterfactual unit) but both of them similar in characteristics.

Partner: P. Parrotta, (Aarhus Business School)

The economic fundamentals of research evaluation (what are the basic problems?)

Dominique Foray

Research is multi-dimensional; several categories of “clients” are potentially interested but on different dimensions of merits. This multi-dimensionality of research and heterogeneity of “clients” raise two problems for evaluation :

a) is referred in the literature as **attention management problem**: some research outputs never reach the “right people” and so some important information about quality are never generated.

b) is referred as **information aggregation problem** because the information generated by the members of external groups is dispersed and is about different dimensions of merit of the project (scientific, societal, political).

This project will involve labs experiments.

Partners: R.Lalive (UNIL), C.Zehnder (UNIL)

Support from the ETH Board

Modeling GPTs for applied macroeconomics development

Dominique Foray, Julio Raffo

The concept of a “general purpose technology” (GPT) and its relationship to innovation, productivity improvement and acceleration of economic growth offers an attractive conceptual tool to bridge the analysis of the micro-economic structures of technological change (innovational opportunities and complementarities) and the modeling of the macro-economic growth path of countries and regional entities. These are the peculiar properties of technical change that are crucial to explain the complex relationships between innovation, productivity and economic growth at macro-economic level.

Partners : P.Zagamé, B. Le Hir (ERASME, Ecole Centrale Paris)

Support from the EC FP7 (Program DEMETER)

Innovation in turbulent times

Dominique Foray

The current economic downturn has created challenges for advanced economies to continue increasing its living standards along a path of growth through innovation and knowledge creation. While the urgency for an innovation agenda has not

changed, the economic context has changed the nature of the debate and the strategic and policy challenges to support technological change and innovation are huge in the current economic environment. These challenges are reviewed in this project which is going to be an input to the next Global Agenda Council (Dubai) and WEF in Davos.

Partners : B.van Ark, E.Phelphs

Support from the GAC Innovation of the World Economic Forum

Topic 2 - University-Industry Relationships and Access to Knowledge

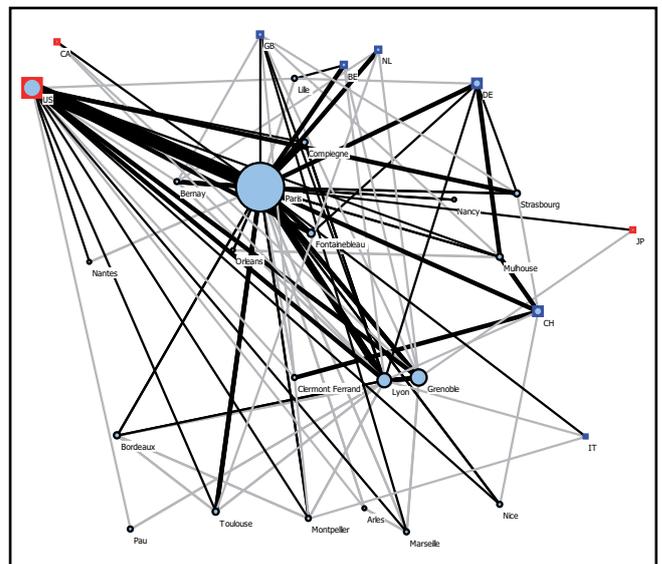
Licensing university inventions to facilitate access to medicines
Dominique Foray, Patrick Gaulé (MIT), Anna Maria Conti (Georgia Tech)

In the “access to medicine” debate, numerous scholars and groups have advocated that universities should use the leverage conferred by academic patents to enhance access to pharmaceuticals in developing countries. This project seeks to make an economic contribution to the debate on humanitarian licensing. We ask how humanitarian licensing is related to optimal pricing, introduce the basic trade-off entailed by humanitarian licensing and discusses the conditions under which humanitarian licensing is possible.

Nanotech clusters

Julio Raffo, Stéphane Lhuillery

The dynamics of S&T clusters are heterogenous and not well understood. The different actors in nano-sciences and nanotechnologies as well as their networking strategies are primarily investigated. Starting with the French case (See map) we aim to understand more specifically the determinants of university-industry integration including its internationalization.



What is behind scientific publications by firms? (PhDs research project)

Markus Simeth, Julio Raffo, Dominique Foray, Stéphane Lhuillery

In this recently initiated research project, we aim to contribute new insights both for the broader Open Innovation debate and the literature concerning science-industry interactions. Initial point is the observation that companies publish considerable amounts in scientific peer-reviewed journals, even without co-authors from academic institutions. Since a voluntary revealing of knowledge is contradictory to the economic necessity for companies to appropriate value, we take a closer look towards the practice

of scientific publishing. More specifically, we attempt to provide empirical evidence for explicit firm strategies and the conditions under which firms make relevant contributions towards “Open Science”.

Partners: G.Von Krogh, S.Haefliger (ETHZ)
FNS Grant n° 100014_125513

Topic 3 - Innovation for Development Exposure to foreign technology and development Julio Raffo, Intan Hamdan-Livramento

It is a fact that most of the global production of knowledge or technology occurs in far fewer countries compared to the number in which most of the global manufacture of goods and services occurs. Developing countries have access to a wider range of technological opportunities by simply interacting with the foreign sector. Our research project involves assessing the exposure to foreign technologies by developing countries under the new context of the TRIPS agreement.

Partners: C. Fink (WIPO)

Technology transfers towards the least developed countries: The Lausanne Group Dominique Foray, Viviana Munoz Tellez

The Lausanne Group (LG) has been created to explore the problem of technologies transfer with a particular focus on the Least Developed Countries. The LG involves academic scholars, practitioners and policy makers with a unique motivation which is to better understand the complexity and difficulties of technology transfers towards the LDCs, to try to generate a new conceptual model and to create a coalition of stakeholders in Switzerland in order to start experimenting this model.

Partners: U. Scheuermeier, L.von Wattenwyl

Topic 4 - Indicator, data and methods for empirical research

Technology measurement Julio Raffo, Stéphane Lhuillery

The precise measurement of technology is crucial for carrying unbiased studies and developing proper policy recommendations. At CEMI, we have gathered several databases related to innovation and IP, such as patent (PATSTAT, WIPO, NBER, INPADOC) or trademarks (OHIM) data. Additionally, we have developed several tools to merge micro-data sources with these databases. We have successfully applied these techniques and indicators to many research projects such as Medical technologies, Education technologies, General Purpose Technologies (GPTs) and SMEs IP strategies.

Swiss representatives in the ESF Research Networking Programme ‘Academic Patenting in Europe’ (APE-INV, 2009- 2013).

Teaching

- Master course in economics
Stephane Lhuillery
- Master course in economics of innovation
Dominique Foray
- Master course in science, technology and innovation indicators
Dominique Foray, Stéphane Lhuillery and Julio Raffo
- Master course in the economics of biomedical innovation
Dominique Foray (with Chris Tucci and Fariba Hashemi)
- Doctoral course in econometrics
Stéphane Lhuillery
- Doctoral course in “Publishing in Management and Economics

of Innovation”

Dominique Foray (with Georg Von Krogh and Oliver Gassmann)

- Doctoral course in technology policy
Dominique Foray

PhDs completed in 2009

Marcel Bogers

“The Sources of Process Innovation in User Firms: An Exploration of the Antecedents and Impact of Non-R&D Innovation and Learning-by-Doing”

Committee: Christopher Tucci, Allan Affuah, Keld Laursen, Dominique Foray

Anna Maria Conti

“Three Essays on University-Industry Technology Transfer and the Economics of Science”

Committee: Marie Thursby, Reinhilde Veugelers, Marc Gruber, Anu Wadhwa, Dominique Foray

Intan Hamdan Livramento

“Examining How Trips Implementation Affects Access to Foreign Technologies for Developing Countries”

Committee: Philippe Thalmann, Marc Gruber, Bronwyn Hall, Luc Soete, Dominique Foray

Patrick Gaulé

“Three Essays on Access to Knowledge”

Committee: Dietmar Harhoff, Mathias Dewatripont, Christopher Tucci, Peter Bossaerts, Dominique Foray

CEMI Seminars

- March 17th, “Academia versus private research in the process of innovation : on the value of academic freedom and openness”
Prof. Matthias Dewatripont, Prof. Dietmar Harhoff
- April 21st, “In The Know: Exploring the Effect of Geographical Proximity on Industry-University Collaboration in the UK”
Prof. Keld Laursen
- June 17th, “R&D and innovation in times of crisis. From macro-economics to climate change: European and Swiss challenges”
Prof. Bronwyn H. Hall, Prof. Luc Soete, organized with Xavier Comtesse (Avenir Suisse)
- July 7th, “University-industry technology transfer: Best Practices and impact on academic research”
Prof. Reinhilde Veugelers, Prof. Jerry Thursby, Prof. Marie Thursby

Main Publications



Peer-reviewed articles, chapters and monographs

- P. Aghion, P.A. David and D. Foray, 2009, "Science, technology and innovation for economic growth: linking policy research and practice in 'STIG' systems", *Research Policy*, vol.38(4)
- D.Foray and F.Lissoni, 2009, "University research and public-private interactions", in B.Hall and N.Rosenberg (eds.), *Handbook of Economics of Innovation*, Elsevier.
- D.Foray and S.Lhuillery, 2009, "Structural Changes in Industrial R&D in Europe and the US: towards a new model?", *Science and Public Policy*, forthcoming
- D. Foray, *The New Economics of Technology Policy*, 2009, Cheltenham: Edward Elgar.
- D.Foray, *L'économie de la connaissance*, 2009, nouvelle édition entièrement revue, Repères, La Découverte, Paris.
- P.Gaulé, 2009, "Access to the scientific literature in India", *Journal of the American Society for Information Science and Technology*, vol. 60 (12).
- S.Lhuillery & E.Pfister, 2009, "R&D cooperation and failures in innovation projects: Empirical evidence from French CIS data", *Research Policy*, Elsevier, vol. 38(1).
- J.Raffo & S.Lhuillery, 2009, "How to play the 'Names Game': Patent retrieval comparing different heuristics", *Research Policy*, Elsevier, vol. 38(10).

Working papers

- B.Hall, D.Foray and J.Mairesse, *Pitfalls in estimating the returns to corporate R&D using accounting data*
- S. Lhuillery, *In search of lost disincentive effects from intra-industry spillovers*, CDM working paper series n° CEMI-workingpaper-2009-005.
- P. Gaulé, *Access to the scientific literature in India*, CDM working paper series n° CEMI-workingpaper-2009-004.
- A. Conti and P. Gaulé, *Are the US outperforming Europe in university technology licensing? a new perspective on the European paradox*, CDM working paper series n° CEMI-workingpaper-2009-003. **Best junior paper award at the DRUID 2009 Conference.**
- A. Conti, *Managing innovations resulting from university-industry collaborations*, CDM working paper series n° CEMI-workingpaper-2009-002.
- I. M. Hamdan-Livramento, *How compliant are developing countries with their TRIPS obligation?*, CDM working paper series n° CEMI-workingpaper-2009-001.

Policy advice and publications

D.Foray provides policy advice to European and international organizations:

- as Vice-Chair of the Expert Group "Knowledge for Growth"; a group of economists established and chaired by the European Commissioner of Research J.Potocnik (http://ec.europa.eu/invest-in-research/monitoring/knowledge_en.htm)
- member of WEF's Global Agenda Councils (Davos)
- member of the UNECE team on Innovation and Competitiveness Policies (Geneva)

D.Foray, 2009, "Introduction" and "Structuring a policy response to a Grand Challenge", in *Knowledge for Growth: Prospects for Science, Technology and Innovation*, European Commission, EUR24047

D.Foray, 2009, *Technology transfer in the TRIPS Age*, ICTSD programme on IPR and Sustainable development, issue paper n°23

Economic Focus Study on SMEs and Intellectual Property in Switzerland, Publication n°5, Swiss federal Institute of Intellectual Property, EPFL and HSG

Scientific / Management responsibilities

D. Foray has the following scientific and management responsibilities:

- Director of the Doctoral Program in Management of Technology at EPFL
- 2009-President of the EPIP association (European Policy for Intellectual Property);
- Member of the National Council of Research of the Swiss National Science Foundation (Division IV - targeted research);
- Member of the Advisory Board of the KOF Swiss Economic Institute at ETH Zurich;
- Associate editor of the peer-reviewed journal "Economics of Innovation and New Technology".

S. Lhuillery is an expert evaluator for the European Commission.

The team

Director:	Dominique FORAY
Senior researcher:	Stéphane LHUILLERY
Postdoc:	Julio RAFFO
PhD students:	Denis BEDNYAGIN Vivianna MUNOZ TELLEZ David FISCHBACH Marianna MARINO Markus SIMETH
Secretary:	Jennifer KATZUNG

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Visit our new CEMI blog:

<http://blogs.epfl.ch/cemi>

Forthcoming Event

**Knowledge in Organisations
International conference in Monté Verità (Ascona)
May 30 - June 3, 2010**