Innovation Systems, Firm Capabilities, Complexity, Finance and Growth

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Innovation is a key driver of productivity, living standards and growth. While innovation is one of the most important determinants of the performance of firms, regions and national economies, as well as a potential solution to global challenges such as climate change and public health pandemics, it is also one of the least understood phenomena in economics. In recent decades, progress has been made on understanding the factors shaping innovation performance at the firm, regional, national and global levels building using the National Systems of Innovation approach, an emergent field in economics, management and public policy.

Seminar 1 April 16 2025	**National and Regional Systems of Innovation** *Innovation Systems – National, Regional, Sectoral and Global Dimensions* This seminar will cover the evolution of the *Systems of Innovation* approach focusing on the main theoretical and empirical developments and its ability to fill gaps in the conventional growth literature. At the end of this seminar participants should have a good understanding of the main features of the systems of innovation approach and the stylised facts, including an appreciation of the unevenness of innovation activity and its persistent concentration in certain firms and regions arising from systems effects.
Seminar 2 6 May 2025 2.00-6.00	**Exploring systems effects using the Community Innovation Surveys (CIS) and the World Bank Innovation Surveys to Analyse Finance and Capabilities Effects** The development of the CIS from the Systems of Innovation approach provides an extensive example of how to go from theory to questionnaire design, to large scale data collection. The session will provide examples of research and papers that have used the CIS data and econometrics (e.g. Probit, systems models, cross-section and panel techniques) to explain firm, regional and national performance. It will also cover the increasing development and use of innovations surveys in low and middle-income countries, which offers new insights for economic development policies.
Seminar 3 8 May 2025 2.00-6.00	**Firms' Dynamic Capabilities: Internal and External Innovation Systems** *Inside the firm (black box) – dynamic capabilities, internal innovations systems*. This session will explore the theoretical and empirical literature on dynamic capabilities and how the management of capabilities is a key factor shaping firms productivity performance and their survival. It will use data on internal capabilities and survivor analysis to predict firm performance.

Seminar 4
12 May 2025
4.00-6.00pm

The Patents Paradox: Innovations to Meet 21st Century Challenges of Climate Change and Pandemics. Can innovations resolve vaccine inequity and climate change?

Patents are designed to provide an incentive for R&D by slowing down the diffusion of innovation, leading to the *patents paradox.* This paper explores the patents paradox and how it might be resolved to meet 21st Century Challenges to protect Common Pool Resources (characterized by non-excludability and subtractability) such as public health and the environment. What role does policy play? Is a one size fits all patent policy appropriate? Should TRIPS be reformed? This session explores firm level and global level systems using the cases of the Covid-19 pandemic and climate change. On climate change we will consider Toyota's 2019 patent waiver which gave royalty free use of 24,000 Toyota patents on electric vehicles, battery and drive chain technologies. Why did Toyota do this and what were its effects? We will see how difference in difference analysis can be used as a technique to look at the speed of innovation diffusion before and after the Toyota patent waiver.

Seminar 5
13 May 2025
4.00-6.00pm

Financial Technology (FinTech), Financial Innovation, Diversity, Innovation Systems, and Growth

Finance influences the cost of borrowing (saving), and the rate at which investment in innovation activities, such as R&D and the introduction of new products and processes, are undertaken. This seminar will examine financial innovations (fintech) e.g. mobile money and their impact on the financial system and growth. Innovations, including organizational innovation and product and process innovations can have negative or positive effects on individual banks and on the financial system (e.g. the financial crisis that followed the invention and diffusion of the sub-prime mortgage). We will focus on the variety of financial institutions from public sector finance, mutuals, banks and venture capitalists. The objectives of different financial institutions (agents) will be identified along with measures of financial sector diversity. The analysis incorporates different behavioral objectives and measures of financial diversity and considers their effects on competition (mixed oligopoly) and on users of financial services (lenders and borrowers).

Seminar 6
15 May 2025
2.00-4.00pm

Innovation and Complexity: Complexity Economics for Sustainability, Productivity and Well-Being

This session will explore a different but complementary approach to innovation systems, building on the work of Arthur and Beinhocker and an ESRC seminar on *Complexity Economics for Sustainability*. It will explore linkages between complexity economics and innovation systems, including the work of Centro-Fermi on competitiveness, and show how it may be used to enhance our understanding of competitiveness and productivity growth. We will consider how a combination of innovation systems and complexity analysis may be used to develop a stronger theoretical and empirical basis for analysis of innovation and its impact on firm and economic performance at the regional and national levels. We will also explore recent attempts to incorporate innovation into *New Growth Theory* and compare and contrast this approach with the Systems of Innovation and Complexity approaches as well as with Endogenous Growth Theory.