PhD research project proposal

Supervisor: Tommaso Ciarli and Maria Savona (joint supervision)

Micro to macro models of economic growth and technical change

Rational of the project

The thesis will be strongly related to a European project recently awarded to SPRU, other European universities such as Scuola Superiore S'Anna, OFCE, Bielefeld, Zurich, and Ljubljana, and Columbia (US).

The project seeks to establish new empirical and theoretical evidence on different aspects of the relation between growth, innovation, structural change, financialisation, globalisation, and inequality. The final aim of the project is to investigate which policies may achieve a demand led exit from the current economic crisis in Europe, and at the same time improve the environmental sustainability of the growth pattern, and curb the increasing inequalities. In particular, we aim to study how the possible alignments/misalignments between Schumpeterian processes of innovation and creative destruction on the one hand, and heterogeneous demand dynamics on the other hand, may or may not lead to sustainable and inclusive patterns of growth in Europe under the current state of low growth, low inflation, and increasing unemployment.

More specifically, the PhD student will work on micro founded (agent based) macroeconomic models that focus on one or more of the above aspects, according to her/his own interests in the core and related topics.

The following are an indication of some of the questions on which the student may want to focus:

* Under which circumstances innovation (product/process/radical/etc) may weaken aggregate demand by increasing income inequality, thus undermining long-run inclusive growth?

* How is the final impact of fiscal shocks influenced by the complex network of input-output relations conducing the propagation of shocks among different sectors of the economy and between different countries?

* Which industrial policies, in an open economy context, may affect the pattern of structural change that induces the growth of employment and income? How are these compatible with reduced environmental impact?

* Which fiscal policies may lead to more inclusive growth by reducing inequality?

* Which are the possible complementarities between Schumpeterian innovation policies and Keynesian demand-management policies in economies subject to Minskyan dynamics?

*Which regimes of innovation, distributed demand, and policies would allow countries to move faster towards green growth trajectories?

Key criteria

The ideal candidate will have a background in one or more of the following areas: Economics, Agent based modelling, Economics of Innovation, Economic Development, and Heterodox Economics; and an interest in the topics of micro-macro modelling, structural change, economic growth, income inequality, and sustainability.

Essential criteria: quantitative and modelling skills, preferably some experience with agent based modelling, and good statistical skills.

Desirable criteria: some research experience is a desirable criterion of award.

If you wish to discuss the project and post, please contact Dr. Tommaso Ciarli by email: t.ciarli@sussex.ac.uk

Selected References (please use the following papers for a longer list of related references)

Ciarli, T. (2012), 'Structural interactions and long run growth: An application of Experimental Design to Agent Based Models', *Revue de l'OFCE, Debates and policies* **124**(5), 295-345.

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Dosi, G.; Fagiolo, G.; Napoletano, M. & Roventini, A. (2013), 'Income distribution, credit and fiscal policies in an agent-based Keynesian model ', *Journal of Economic Dynamics and Control* **37**(8), 1598 - 1625.

Dosi, G.; Fagiolo, G.; Napoletano, M.; Roventini, A. & Treibich, T. (2015), 'Fiscal and Monetary Policies in Complex Evolving Economies', *Journal of Economic Dynamics & Control* **forthcoming**.

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Kirman, A. (2010), *Complex Economics: Individual and Collective Rationality*, Taylor & Francis.

Leijonhufvud, A. (2006), Agent-Based Macro, *in* L. Tesfatsion & K.L. Judd, ed., , Elsevier, , pp. 1625 - 1637.

Nelson, R. R. & Winter, S. G. (1982), *An Evolutionary Theory of Economic Change*, Harvard University Press, Cambridge, MA.

Saviotti, P. P. & Pyka, A. (2008), 'Technological Change, Product Variety and Economic Growth', *Journal of Evolutionary Economics* **18**(3-4), 323-347.

Silverberg, G. & Verspagen, B. (2005), Evolutionary Theorizing on Economic Growth, *in* Kurt Dopfer, ed., 'The Evolutionary Foundations of Economics', Cambridge University Press, Cambridge, pp. 506-539.