

Proposal for the foundation of the

Institute of Economic Complexity INET - Italy



"If we are to achieve things never before accomplished we must employ methods never before attempted" — Sir. Francis Bacon

The mission

In the wake of the financial crisis and its subsequent spillover into the economy one of the major challenges is to rekindle the very foundations of economics and finance. New economic theories should be strongly data driven in order to provide a more concrete scientific grounding to economics, so as to expand the realm of quantitative methods into socio-economic sciences. This new grounding for economic disciplines is perfectly aligned with the mission of the Institute for New Economic Thinking (INET) which is a key partner of this initiative.

Structure and planning

We intend to establish a new scientific institution, focused on socio-economics, addressing the challenge of completely new questions and of finding innovative answers to the global societal issues faced nowadays. The institution aims to be a national and international hub creating a suitable and open environment for the integration of economic research and business innovation. This represents a special opportunity for Italy to provide a more flexible research environment leveraging cooperation between public and private institutions. The total budget planning amounts to 3-5 million euro per year for five years.

Economic complexity

Economic Complexity is a multidisciplinary approach facing emerging economic phenomena from multiple perspectives: complex systems analysis, simulations, systems science methods, and big data capabilities (Google-like approach) offer new opportunities to empirically map ecosystems of capabilities, analyze their structure, understand their dynamics and measure their complexity. This approach provides a new vision for a data-driven fundamental economics, which is mandatory in a strongly connected, globalized world.

Big Data and Global Systems Science (GSS)

Nowadays the availability of large amounts of socio-economic data is providing scientific evidence to support policy-making, public action and civic society to collectively engage in societal action. This action goes under the name of GSS in the European Union programs of Horizon 2020 and it is our ambition to be an active partner in this challenge.

Research mission: from qualitative to quantitative

Economic complexity refers to a new line of research which portrays economies as a process of evolution of ecosystems of technologies, industrial and financial capabilities. This implies a focus on the interplay between finance and economic theory.

- Economic scenarios for industrial planning, opportunity and risk evaluation and asset allocation.
- Market endogenous dynamics and reflexivity, financial agent-based modeling and financial systemic risk.

Education

The institute will foster knowledge contamination with the aim of educating a new generation of scientists capable of developing open and non-dogmatic economic paradigms through a problem-oriented approach beyond traditional disciplines.

Dissemination and policy modeling

We consider dissemination as one of the cornerstones for the success of the initiative. Dissemination will be shaped to impact on both political modeling and reinforcing citizens' awareness in their own economic perspectives.

Business Innovation: e-commerce and the ecosystem for startups

Complexity is a scientific discipline intended to avail itself of a quantitative framework in order to understand non trivial patterns emerging from the interaction of entities particularly suited to deal with social-economic issues. Importing this framework into business innovation is crucial in order to set up a healthy competitive and flourishing playground for business. To interrelate scientific and business activity, the initiative will be partly devoted to creating a scientific approach for e-commerce and a fruitful ecosystem for startups which appears to be the most effective strategy to transfer scientific knowhow to market.

Coordinators of the initiative

Luciano Pietronero, Sapienza University of Rome and director of the Institute of Complex Systems, CNR Rome
Email: luciano.pietronero@roma1.infn.it

Robert Johnson, President of the Institute for New Economic Thinking, New York

Sponsors and Partnerships

The following institutions have manifested a concrete interest in supporting this initiative:

- Institute of New Economic Thinking - New York (USA)
- Alibaba Research Center (China)
- Boston Consulting Group - New York (USA)
- Royal Dutch Shell - Den Haag (NL)
- Bravofly Rumbo Group - Chiasso (CH)
- Sony CSL - Paris (FR)

Scientific collaborators and advisors: G. Dosi (*Scuola Sant'Anna, Pisa*), F. Pammolli and G. Caldarelli (*IMT, Lucca*), M. Gallegati (*Univ. Marche, Ancona*), J. Stiglitz (*Columbia Univ., New York*), A. Kaletsky (INET, New York), William Janeway (*Warburg Pincus and INET Cambridge*), E. Beinhocker (INET, Oxford University), M. Reeves (*BCG, New York*), R. Kupers (*consulting, NL and Oxford University*), Y.C. Zhang (*Univ. Fribourg, CH and Alibaba Research, Hangzhou China*), A. De Maio (*Area di Ricerca, Trieste*), M. Corradino, entrepreneur (*Bravofly Rumbo Group*), C. Esclapon (*Club Italia Investimenti 2, Milano*), V. Loreto (*Sapienza, Roma*), R. Panzarani (*Studio Panzarani Roma*), G. Casati (*Univ. Insubria*), M. Rasetti (*ISI, Torino*).

Currently financed research projects in EC

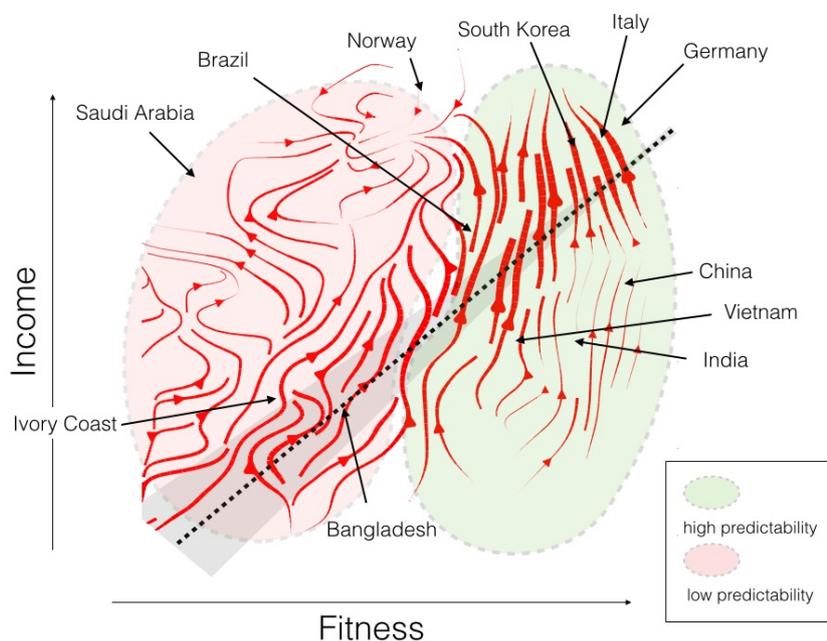
- **Crisis LAB**, Special Project of Italian Research Ministry (2013-2015), dedicated budget €7 million - coordinator: Prof. L. Pietronero.
- **GrowthCom**, EU STReP project (2014-2016), dedicated budget €1.5 million - coordinator: Prof. L. Pietronero.
- **Multiplex**, EU IP project (2013-2016), dedicated budget €2 million - coordinator: Prof. G. Caldarelli.
- **Every Aware**, EU STReP project (2013-2016), dedicated budget €1 million - coordinator: Prof. V. Loreto.

The Institute for New Economic Thinking (INET)

INET is a non-profit economic research organization based in New York, Oxford, Cambridge, Copenhagen and other locations worldwide. The goal of INET is to build a global community of new economic thinkers to engage in the crucially important task of creating new ideas to guide our economic future. INET was founded in 2009 under the stimulus and support of George Soros, William Janeway, and others to stimulate innovation and debate in economics, support visionary interdisciplinary research, and redefine the education of the next generation of economists, academics, corporate executives, and government leaders. Many of the great challenges today – from rekindling economic growth to addressing poverty, inequality, financial instability, and sustainability – require new economic thinking. From the point of view of policy making the idea is to move from the deregulatory logic of the Washington consensus toward a system of financial governance that restores the financial sector to its purpose of serving the society. INET supports this initiative both from a scientific perspective and through a budget sponsorship. In particular, **INET is willing to contribute one third of the total institute budget for an initial period of 5 years.**

An example of economic complexity: weather-like forecast for economics (<http://pilhd.phys.uniroma1.it>)

Unlike what is usually expected from standard economic theory, international trade data reveal that **diversification of productive systems is more important than specialization for the assessment of country development and success**. The strongly interconnected globalized world economy suggests that flexibility and adaptability are essential elements of competitiveness in strong analogy with bio-systems. The crucial challenge is thus how to turn these qualitative observations into quantitative variables. In this perspective, two new non-monetary metrics, the **fitness of countries** (competitiveness) and the **complexity of products**, provide effective information for **industrial development policy, policy modeling and structural analyses of economic systems**.



Country positions are referring to 2010 — Red lines are averages of country trajectories
Income is measured by Gross Domestic Product *per capita*, PPP (current international \$)

In the figure we illustrate one example of an application of these new non-monetary metrics. The direct comparison of fitness with country income gives **an assessment of the hidden potential of countries**. The **country evolution shows a large degree of heterogeneity** which implies that countries that are in a certain zone of the **Fitness-Income plane** evolve in a predictable way while others show a chaotic behavior. Making reliable predictions of growth in the context of economic complexity then calls for a paradigm shift. In this case, **forecasting economic growth and development addresses issues very similar to weather forecasting** and, in general, conceptually resembles the challenge of forecasting the evolution of dynamic systems where **zones with different degrees of predictability coexist in the same dynamics**. [*Sci. Rep* 2012, *EC guide* 2014]