

Summary

Complexity of the Economy: Research and Policy Implications Workshop (26-27 October 2015, OECD Headquarters, Paris)

We cannot solve problems by using the same kind of thinking we used when we created them.

Albert Einstein

The financial and economic crisis struck at the core of tightly held economic theories, models and ideas. It sparked a debate on new economic thinking. But during this period of reflection and soul-searching, a quiet revolution was taking place in the social sciences and in policy design.

The availability of large-scale agent-based computing, computationally-facilitated network analysis, and ‘big data’ resulting from the internet has combined to forge a new kind of economics – complexity economics – which is more relevant for policy than traditional approaches.

Complexity economics has developed from being viewed as heterodox in the 1980s to now being actively explored by central banks, governments, and international institutions. A reason for this interest is that complexity offers a way to understand the economy as it really is, and offers the potential for new policy insights into some of our biggest challenges.

A workshop was held at the OECD on 26-27 October 2015 to explore the complexity of the economy: research and policy implications. Organised by the OECD in collaboration with the Institute of New Economic Thinking (INET) Oxford, the Global Complexity Network (GloComNet) and the European Commission, the workshop considered the usefulness of complex systems thinking for policy and offered some exciting examples and applications.

The Secretary General opened the discussion by highlighting the importance of complexity thinking for policy. He stated that policymakers should stop pretending that an economy can be controlled, rather emphasis should be placed on building resilience, strengthening policy buffers and promoting adaptability by fostering a culture of policy experimentation. OECD has started to embrace complexity and systems thinking with work on global interconnections (TiVA, STRI etc.), modelling work to link economic and other systems models such as environmental (CIRCLE project) and governing complex systems in education.

Banking and Finance

- John Geanakoplos from Yale University discussed his ideas on the “leverage cycle”. The basic insight is that variations in leverage cause fluctuations in asset prices. Governments have long monitored and adjusted interest rates. However, leverage (equivalently, collateral rates) must also be monitored and adjusted to avoid the destruction that the tail end of an outsized leverage cycle can bring. Financial crises are not black swan events – they are a function of known and measureable systemic factors – including leverage.
- The study of complex networks provides a new and powerful perspective on the critical infrastructure of financial systems. Networks – broadly understood as a

collection of nodes and links between nodes – offer a useful representation of financial systems. Several useful examples of complex networks were presented but Adrian Blundell-Wignall felt that while interesting, the research still underestimated the degree to which the activities of financial institutions were intertwined.

- A screening of the movie “Boom Bust Boom” triggered a fervent but constructive debate on the lessons from the financial crisis and the current state of economics. Catherine Mann questioned some of the assertions and rebuffed criticisms made about the economics profession – leading to a spirited backlash from the audience.

Innovation, Growth and Cities

- Luciano Pietronero presented some fascinating new thinking from physics on economic growth. He emphasised the importance of networks of capabilities in providing growth opportunities. The complexity of products produced and the “fitness” of an economy are essential in understanding future growth prospects.
- Geoffrey West from Santa Fe Institute and his colleagues using lessons from biology and physics have tracked the dynamics of urban centres around the world and have discerned laws containing “universality” to them. For instance, doubling the size of a city systematically increases income, wealth, number of patents, number of colleges, number of creative people, number of police, amount of waste... all by approximately 15%. These results have been observed in hundreds of cities all around the world. Several ideas emerged which are useful for urban work and may help guide policy priorities.

Complex Models and Big Data

- The workshop concluded with discussions on complexity methods including foresight and agent-based models (ABMs) and big data. ABMs use modern computers’ number-crunching power to simulate people and institutions who do not necessarily behave optimally, and who interact. But to do so they require large amounts of data. Several examples were presented illuminating how big data is being used to predict a range of phenomena from the spread of flu to movements in the stock market. It has significant potential to supplement official sources of data and increasingly OECD has a role to play in making big data accessible and useful for policy analysis.

The discussions highlighted the potential of complex approaches to understanding the economy. Participants were impressed that the OECD was taking on a leadership role in promoting this new research through the New Approaches to Economics Challenges (NAEC) Initiative. Indeed parallels were drawn between the NAEC and the European Commission programme on Global Systems Science and synergies will be explored in the coming months.

The Director General of the EC Joint Research Council also proposed a joint initiative on how to concretely use advances in theoretical frameworks to inform specific policy issues. All organizing institutions agreed that the discussion on complexity should continue. The field is developing fast and the engagement and leadership of the OECD and its member states can dramatically accelerate progress ultimately leading to better policies for better lives.

A recording of the workshop as well as interviews with participants can be found [here](#).