INTEGRATIVE ECONOMICS

Summary

5-6 March 2020, OECD Conference Centre, CC2.

If we want to put people at the centre of economic policy, then economics has to study people. It has to understand how their thoughts, feelings, aspirations, history, and culture interact inside them to produce the decisions and actions visible to the outside world. Understanding people to understand the economy is at the core of New Approaches to Economic Challenges (NAEC), and is the central issue of this conference on integrative economics. "Integrative" means an economics that calls on the insights and methods of the range of disciplines needed to paint a realistic picture of how the economic system is shaped and helps shape the larger “system of systems” it is part of.

Traditional economics does not provide the tools we need to analyse the many, often irrational-seeming, behaviours that are generated by the uncountable interactions of billions of people, firms and institutions locally or globally, in small groups or as nations, at timescales ranging from nanoseconds to millennia.

This NAEC conference invited world experts on state-of-the-art policy applications emerging from new analytical tools and techniques to show how methodological innovations and interdisciplinary approaches such as agent-based modelling, nowcasting, machine learning, and network analysis could contribute to a better understanding of the complexity and interaction of our economic, financial, social and environmental systems.

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In September 2019, the New Approaches to Economic Challenges (NAEC) Group Conference discussed the theme *Averting Systemic Collapse*. The central argument was that human systems are complex and prone to cascading failure. The more policy-makers attempt to optimise these systems, the more unstable they become. While attention focuses on triggers - pandemics, natural disasters, geopolitical tension - it might also be worth thinking about the stability, resilience and functionality of systems under any conditions. Human systems - financial markets, production chains and the economy - are built for short-term efficiency not long-term resilience. While the efficiency of these systems are disputable, many nodes in the system have been monopolised in ways that result in the concentration of vital industrial capacities.

*Integrative Economics* featured Nobel Laureate James Heckman who outlined what multi-disciplinary insights are being integrated into economics including psychology and early childhood development. Gabriela Ramos, Chief of Staff and Sherpa who oversees NAEC, opened the Conference by highlighting that the Coronavirus outbreak was a perfect example of a long-held message of NAEC. We are not living in a linear, Newtonian world where actions cause predictable reactions. We are in fact part of a complex system of environmental, socio-political and economic systems that we are constantly reconfiguring and that is constantly affecting us. She defined “Integrative” as an economics that calls on the insights and methods of the range of disciplines needed to paint a realistic picture of how the economic system is shaped and helps shape the larger “system of systems” it is part of. Furthermore, she highlight that systems thinking allows us to identify the key drivers, interactions, and dynamics of the economic, social, and environmental nexus that policy seeks to shape, and select points of intervention in a selective, adaptive way.

Andrew Sheng (INET) set the issues in context by discussing whether we need disintegrative or integrative economics. The *economics discipline has increasingly fragmented into “disintegrative” specialist fields, becoming more complex and diverse, but may now follow other fields in a more “Integrative” direction.* Sheng, sharing some of the recent thinking of INET’s Commission on Economic Transformation, suggests that it is easy to criticise the old economic paradigm but not easy to construct a practical, achievable new one, which is still being formed with multiple approaches. He suggested the new paradigm might evolve through competition from diverse national models.

Joshua Epstein (NYU) outlined the global spread of pandemics with a focus on Coronavirus. This included the idea of a coupled contagion – COVID-19 and fear about it (which affects health and economic behaviour) – and how their interactions produce volatile dynamics. Individuals contract fear through contact with the disease-infected (the sick), the fear-infected (the scared), and those infected with both fear and disease (the sick and scared). Scared individuals---whether sick or not---withdraw from circulation with some probability, which affects the course of the disease epidemic proper. If individuals recover from fear and return to circulation, the disease dynamics become rich, and include multiple waves of infection, such as occurred in the 1918 flu (see figure below).
Epstein then introduced Agent_Zero as a cognitively plausible alternative to the rational actor, demonstrating core phenomena in a range of fields, proposing that we use it to take animal spirits seriously in economic models. Michele Cecchini from ELS presented work on Agent-based Modelling (ABM) and Anti-microbial resistance (AMR). This involves modelling the spread of resistant infections in the community and across hospitals. The model tests the return on investment of selected policies such as, are investments optimised by targeting policies on ‘high-risk’ hospitals and is screening of all incoming patients to detect AMR a good investment?

Jean-Philippe Bouchaud (CFM) discussed how economists and physicists are modelling the dynamics of a range of economic and financial phenomena and in particular instabilities and crises. He outlined how interactions and externalities can lead to collective instabilities – endogenous volatility where small shocks can lead to large effects and unexpected crises, often disproportionate with real causes. ABM are the perfect arena to develop these ideas.

Doyne Farmer (INET Oxford) explored the complexity economics revolution which flies in the face of 150 years of economic theory. He argued that there are many benefits that come from making this big step (such as being able to deal with endogenous dynamics), many challenges that must be overcome, and a few examples where it is already succeeding. In particular, complexity economics models are much more easily connected to the broader socio-economic system, and can potentially shed new light on problems like inequality, climate change and financial crises. Penny Mealy re-enforced this argument providing an outstanding and important presentation on multiple features of production networks that help us understand the labour market and the future of work.
Friends of NAEC Co-Chair Ambassador Irena Sodin opened day 2 with an excellent set of remarks mentioning the trade-off between efficiency and resilience. "We see that in global supply chains, surely one of the most efficient components of the international economy. But what happens when your just-in-time workflow is disrupted by shock such as coronavirus or new border controls? Maybe just-in-time needs a dose of just-in-case".

Matheus Grasselli (Fields Institute) presented alternative models which have much richer dynamic outcomes and allow the exploration of nonlinear feedback loops that are entirely absent from traditional models, in particular the crucial interaction between private debt, economic activity, and global temperature. Shardul Agrawala while acknowledging several novel features of the modelling work, also noted that the presentation was critical of Integrated Assessment Models but suggested that the authors should delve more deeply into the literature on these models and consider more clearly how they are used in policymaking.

Angus Armstrong (Rebuilding Macroeconomics) closed the Conference with a discussion on use and misuse of economic models before and after the Financial Crisis. He concluded that there were questions at the time which existing approaches could not answer. But things have changed, especially in the development of new analytical approaches (citing developments in particular at the Bank of England).

Discussions confirmed that a new approach is emerging from the study of complex systems; an approach based on reinforcing an important system characteristic: resilience. A resilience approach accepts that all systems might fail. This approach focuses on the ability of a system to absorb, recover from, and adapt to a wide array of shocks. Increasingly, we have the tools and techniques to analyse the world in this way. Following on from the conference NAEC Masterclasses, which also attracted younger participants, provided a deeper look at the models and approaches (agent-based and stock-flow consistent modelling) discussed during the Conference.

The Conference was organised with a number of collaborating institutions including the Santa Fe Institute, the Fields Institute, New York University (NYU) School of Global Public Health, Rebuilding Macroeconomics, Ecole Polytechnique, Capital Fund Management (CFM) and the Institute for New Economic Thinking (INET). Baillie Gifford and Partners for a New Economy provided financial support. Several participants suggested that NAEC should co-ordinate a consortium of institutions convinced by the need to look at complexity, systems, networks and agent-based approaches. A web of MoUs are currently in the process of being finalised.

It has never been more important to understand system dynamics and the emergence of crises. The Covid-19 pandemic and its systemic consequences underline this and reinforce the need for international cooperation to cope with global threats. Covid-19 also shows signs of being the catastrophe that was needed to change attitudes towards expertise and evidence-based decision-making. Even media that traditionally argue for “common sense” approaches to complex issues are now highlighting the findings and advice of scientists and public health officials.

NAEC will continue to examine these crucial issues with the next NAEC Group Conference Confronting Planetary Emergencies: Solving Human Problems including Thomas Piketty and Esther Duflo (which will focus on how new economic thinking and acting is providing new solutions to inequalities, development and environmental challenges).

NAEC is helping OECD Members to better prepare for threats that emerge in a highly complex and interconnected but fragile world economy.

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