

New Approaches to Economic Challenges

Integrative Economics

5-6 March 2020

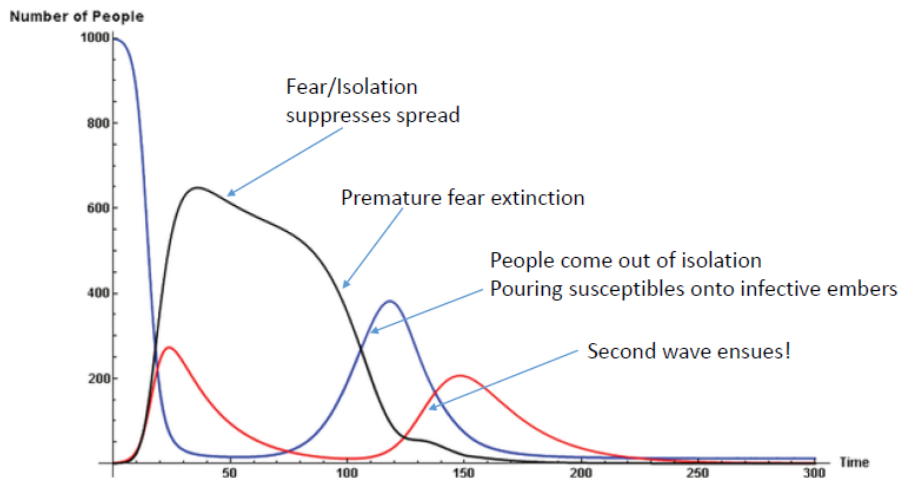
In September 2019, the New Approaches to Economic Challenges (NAEC) Group Conference discussed [Averting Systemic Collapse](#). The central argument was that human systems are complex and prone to cascading failure. The more policy-makers attempt to optimise these systems, the more unstable they become.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

[Integrative Economics](#) featured Nobel Laureate James Heckman, who outlined what multidisciplinary insights are being integrated into economics, including psychology and studies of early childhood development (video [here](#)). 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 highlighted 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 Covid-19](#). This included the idea of a coupled contagion – the virus itself and fear of 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).

In the idealized run of figure 3, susceptible individuals (blue-curve) self-isolate (black curve) through fear as the infection of disease proper grows (red curve).



Epstein JM, Parker J, Cummings D, Hammond RA (2008) Coupled Contagion Dynamics of Fear and Disease: Mathematical and Computational Explorations. PLOS ONE 3(12): e3955. <https://doi.org/10.1371/journal.pone.0003955>
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0003955>

Epstein then introduced Agent_Zero as a cognitively plausible alternative to the rational actor, demonstrating core phenomena in a range of fields, and 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 and assesses investments optimised by targeting policies on ‘high-risk’ hospitals and screening of all incoming patients to detect AMR.

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 although many challenges must be overcome, many benefits come from making this big step (such as being able to deal with endogenous dynamics) and gave a few examples of 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 presentation on [multiple features of production networks](#) that help us understand the labour market and the future of work.



Mainstream economics says the economy changes because of “shocks”
Exogenous Dynamics



But the weather changes all by itself
Endogenous Dynamics





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, the Forum for a New Economy, IIASA, JRC, Capital Fund Management (CFM) and the Institute for New Economic Thinking (INET) Oxford. Baillie Gifford and Partners for a New Economy (P4NE) generously provided financial support.

Recent events highlight the growing importance of systems resilience. NAEC will continue to examine these crucial issues with the next NAEC Group Conference *Confronting Planetary Emergencies - Solving Human Problems*. This meeting on October 9th includes Thomas Piketty and Esther Duflo and 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.

For more information:

www.oecd.org/naec

www.oecd.org/naec/resilience

www.oecd.org/naec/averting-systemic-collapse

www.oecd.org/naec/integrative-economics

