



10 Years After the Crisis - modelling meets policy making

Fields Institute, Toronto

Summary

On 14-16 January, NAEC held a series of discussions with the Fields Institute in Toronto, Canada with the theme “[10 Years After the Crisis - modelling meets policy making](#)”. Fields is a leading mathematics research centre in Canada with strong ties to academia, business and government.

The conference was a follow-up to [10 Years After Lehman Brothers](#) held at the OECD and discussed how to model financial markets and their interactions with the real economy and featured speakers such as Andy Lo from MIT, John Geanakopolos from Yale and Blake LeBaron from Brandeis. Themes included the Complexity of the Financial System (ABM and networks), Cyber-security and the Financial System, Financialisation and Inequality, Climate Finance, Behavioural Finance and a final roundtable discussion asking “Are we Ready for the Next Crisis?”. A number of senior Canadian officials and policymakers from Finance Canada, the Bank of Canada, the Federal Reserve and the Canadian financial regulatory authority also participated as did several representatives of the banking and high-tech industries.

The discussions commenced with a number of mini-courses with leading academics on issues of interest to the NAEC Innovation LAB: Complexity Economics, ABM, Asset Price Bubbles, Networks and Systemic Risk and Blockchain. The full agenda is available [here](#). The courses and the subsequent conference are available by webcast [here](#). A number of students and faculty attended these courses as did two promising colleagues from the Economics Department (sponsored by NAEC).

The conference offered different perspectives on the financial system, how it works, develops endogenous shocks and how it should be regulated. The contributions will inform the [NAEC book on the Financial System](#), edited by Patrick Love which is nearing completion.

Collectively mathematicians, physicists, computer programmers, economists and policymakers came to some important conclusions about modelling and policymaking:

- The building blocks of traditional economic models have their shortcomings including the assumptions on agents (lack of heterogeneity) and their behaviour (rational expectations). There has been too little consideration of cycles and interactions of financial products and practices (the leverage cycle and interplay between leverage, collateral and asset prices).
- There are alternatives and new modelling tools and techniques are needed to improve our understanding the system (Agent-based Models (ABM), Network Analysis, Bayesian Graphical Models etc.).
- There is a high degree of acceptance now of the need to think about the economy and the financial system as a complex adaptive system and the tools of complexity are increasingly being used in policy-making institutions, regulatory agencies and Central Banks.

- Network analysis is essential to understand systemic risks (Tom Hurd). Stresses in one or more institutions could trigger default or stresses on other institutions leading to scale cascades of system failure.
- The Institute for New Economic Thinking (INET) provided details of state-of-the-art ABM modelling which offers a more realistic way of thinking about markets. They will continue to be a key partner of NAEC as OECD work in this area gets up to speed and will be an important partner for the Innovation LAB. Joint work will be supported financially by Baillie Gifford's three year funding package.
- Cyber-security has emerged as one of the most important systemic risks to financial stability and should be considered like other risks – credit risks, operational risks etc. It is now a major concern of financial institutions and there is no way to eliminate it. Beyond technical solutions which should be enhanced, it should be remembered that there is always a weak human link and therefore educating employees and customers to the threats should also be undertaken.
- Inequality has probably increased financialisation rather than vice-versa as is commonly assumed according to Lars Osberg and Steve Pressman. The wealthy spend less of their income proportionally and the poor and middle class increasingly have to borrow to maintain living standards, leading to financialisation. Neo-classical models are poorly equipped to model these relationships. Unbalanced growth will increase financial fragility, generate periodic crises and lead to real economy instability.
- Using stock-flow consistent models, Gael Giraud and his co-authors suggested that climate change, unchecked, could lead to financial and economic collapse. A price signal (carbon tax) provides the right incentive to avoid most of the climate damage but would not preclude financial risks.
- A New Paradigm and new narrative are needed to understand financial markets. This would include better understanding of how individuals make mistakes, learn and adapt and such evolution determines market dynamics. Negative feedback is essential and Andy Lo suggested a financial NTSB be established for analysing market crashes.
- The Central Bank of Canada and Finance Ministry were reasonably confident about the ability of the authorities to handle another crisis and that buffers, safeguards and resilience were adequate. However, Bill White suggested another crisis is inevitable and its magnitude could be even greater than that of the 2007-08 crash. He pointed out the limited potential of policy mechanisms for crisis prevention, crisis management and crisis resolution.

The conference highlighted the benefits and the necessity of collaboration, experimentation and inter-disciplinarity in promoting new economic thinking and acting. It highlighted the important role NAEC is playing in federating and focusing the energies of different clusters of researchers to develop a systemic perspective on some of our most pressing challenges and the tools, techniques and narratives needed to understand them. This can make a contribution to a number of workstreams at the OECD and improve analytical capacities.

The Fields Institute is an ideal collaborator for NAEC and there were several opportunities discussed for strengthening co-operation, involving parts of the Canadian government (this was discussed at a meeting with a Senior Director from the Bank of Canada) and INET. There may also be interest in funding such a joint effort from the Natural Science and Engineering Research Council (NSERC).