

## REBUILDING MACROECONOMICS DISCOVERY MEETING, 5 JULY 2017

### Why are Economies Unstable?

Today we discussed the question, “*Why are Economies Unstable?*” in our Instability Hub's discovery meeting. There were four topics of discussion:

- (1) Different Modelling Approaches
- (2) New Microfoundations
- (3) Credit or Financial Crises
- (4) Secular Stagnation and Balance Sheets

This summary note provides an overview of what was discussed.

### Different Modelling Approaches

What new methods are there for modelling instability?

Traditional economics has been focused on the concept of equilibrium and has tended to work from the microeconomic to the macroeconomic level. A suggested alternative approach is to start at the macro level and go from there. A model was presented that showed how an economic system that appears to be initially stale can become unstable. This was a highly simplified macro model, but it predicts an unstable equilibrium.

Instability and disequilibrium are not unusual or exceptional outcomes; they only appear so when viewed from the microeconomic perspective of imposed equilibrium as a systemic expectation. The notion of equilibrium has become so dominant in economics mainly due to mathematical convenience, rather than being a known property of economic systems. The actual economy is never in equilibrium, there are always shocks every day and we are still responding to shocks that happened in the past. The economy being a dynamic system subject to external forces might mean there is a good chance it will tend towards an unstable equilibrium. The use of far from equilibrium, or non-equilibrium dynamics in macroeconomics, instead of the general equilibrium methods often used, could be useful in describing economic behaviour.

There is debate in economics on the best way of modelling dynamics. Should we think of there being perpetual movement or in terms of “Wicksell’s rocking horse”? The kinds of cycles we see are not regular – if they were then we could then predict them. Complex systems can generate patterns that look random but are predictable if you know the initial conditions, or structure of the underlying model.

For a discussion on alternative ways of thinking about business cycles, see Roger Farmer's blog [here](#), and on the other hand, one by Doyne Farmer [here](#).)

One problem with the conventional approach is that the cycles which are observed in real economies are not regular, and recessions are difficult to predict. Complex systems analysis might be able to predict unexpected downturns. The economist William Brock argued in the late twentieth century that non-linear dynamics were not particularly useful. This is because such systems can be tested in the physical sciences since enormous amounts of data for testing can be generated through experiments. In Economics, there are perhaps 300 to 400 time-series observations covering possibly twenty business cycles, and there is not enough data available to distinguish disturbed linear systems from chaotic dynamics. What is missing from current models is an understanding of why economies don't seem to return to a single rest point, and tend to stray from optimal levels for long periods of time. However, it was also mentioned that mainstream economics has produced some valuable ways of thinking about these problems, and should not be entirely rejected.

The ability to predict outcomes from a given data set decreases exponentially in relation to the dimensions on which those data sit. In physics, it can be shown that as systems are driven away from equilibrium as they move to increasingly high levels of chaotic behaviour. Also, that if you move far enough from the equilibrium, even billions of observations will not be enough to provide predictive power. We have too few data points in economics to distinguish deterministic chaotic dynamics from stochastic behaviour.

One way of viewing this is to think of the economy as sitting on some form of chaotic attractor, on top of five or six dimensions, and that it would be possible to make models that take advantage of this structure. This is an area which is largely unexplored. "Chaotic attractors" are analogous to big bread machines, which cause observed phenomena to separate through time but then to fold back over one another. However, whilst you can write down chaotic models, how can you know if the right model has been structured, and whether it has empirical relevance?

If modelling should begin at the macro level, should we abandon the micro level all together? From a policy perspective, it can be hard to argue consequences of decisions if you omit the micro level. Whether the economy shows unstable chaotic dynamics is a separate question to whether the questions should be addressed from a micro rather than a macro perspective. Most agent-based models are developed at the micro level and then aggregated up to the macro level. It was suggested this work should start at the macro level without having to complete the initial micro stage of the argument.

To better understand complex system dynamics, a better understanding of social groups and how people interact might be needed. From birth there are social relations such as identities, norms and narratives, which all are group phenomena that reflect in micro and macro processes. Models need to connect with social and reflexive behaviour to understand the interactions that drive system dynamics which are chaotic and complex. Introducing the ability for preferences to change over time and describe what drives preference formation may be a fruitful area of research.

Most the dynamics we see come out of the structure of the economy, and these are very difficult to describe in their entirety through one model. Some of the most interesting dynamics are the result of simple behavioural relationships, and so it might be the goal of the modeller to get the structure of a simple model right, rather than develop a model that tries to explain everything at once.

## New Microfoundations

Whilst there is a great deal the equilibrium models favoured by economists can tell us, a completely different framework may be required to look at economic behaviour without the assumption of equilibrium. Social and psychological sciences provide different perspectives to mainstream economics.

The information we come across in our lives requires interpretation, substantial work in psychology has been directed towards the idea that the world is constructed: that humans make it up. This is a prevailing view in neuroscience, which centres on understanding what brings people to see the world in the ways that they do. If we began to model the ways in which people form the ideas they have, perhaps we get to a deeper way of modelling from microfoundations.

When uncertainty is introduced it becomes harder to form models as there is no clear right or wrong answer to the actions agents make. For example, around Brexit, arguments were being made that were not closely based on the empirical information people had around them – people didn't necessarily know how the outcome would affect them, and also there is the influence of groups on how people voted. When it comes to policy, it may be useful to consider a dynamic approach to collective action.

There could be conflicting scales of value which people hold at the same time. People may behave differently and have different preferences depending on the context they find themselves in. Since the context we are in changes all the time, a model based on the idea of fixed preferences limits our understanding of human behaviour.

A lot of work in social science is based around the coping mechanisms we use to deal with uncertainty. Economics gets around this by categorising uncertainty as risk, but the two are not necessarily identical. If you are unaware of a possible outcome, you cannot place a level of risk on it happening as the occurrence of it never occurred to you. This is along the lines of Herbert Simon's work on computational limitations, who suggested people behave according to adaptive heuristics, or satisficing. This is where people find ways of dealing with a particular situation or circumstance and varies considerably with the situation and tools available.

Another way of thinking about how people deal with uncertainty is by narratives (for a detailed discussion of narratives, see David Tuckett's blog [here](#)). This is where people form their own judgements about the world around them by factoring in all sorts of information. These narratives do not have to always be right, they allow for human error, but it is these narratives that form the basis of human behaviour. This is similar to the view of Keynes' animal spirits, as a narrative can be formed on the basis of what we see people around us doing. This is a very general way for explaining how people navigate uncertainty and decide upon their actions that goes much deeper than the current way economics models behaviour.

Optimism is caught in basically the same way as influenza. Once animal spirits are thought to matter, a way of modelling how belief systems operate is needed. Might it be useful to think of a distribution of preferences? This could provide different insights than the standard general equilibrium theory.

The point about narratives is that they are inherently fragile, shifting and unstable, both individually and collectively. Take for instance the Grenfell fire disaster. There was a significant change in regulation in response: this wasn't done from an optimisation problem, but rather because people's attitudes had shifted. Narratives can change very quickly – speculative bubbles such as the dot-com bubble are examples of this group-think mentality. Due to the large differences between the notions

of risk and that of uncertainty, perhaps a new effort is needed to focus from the start on the sources of disequilibrium.

The notion of fixed and exogenous preferences of the neoclassical tradition is not realistic. To some extent, this is a version of biological determinism: that our preferences are endowed by nature and that socialisation does not change behaviour. One reason why human beings have been more successful than other primates is because we cooperate. Our ability to cooperate depends on how our preferences evolve together in social groups. Changing preferences is a significant factor for explaining our civilisation and where it is heading.

When a situation is replicated, that is to say, it has happened before, then it is possible to analyse it in terms of risk since some information regarding the outcome is available. However, if it is not replicable then something new is happening, and risk is not relevant. It is important to think of how we deal with non-replicable situations. The human mind deals with uncertainty by focusing on survival, biasing behaviour towards self-preservation.

An implication for policy may be that policy makers are interested in creating contexts that induce people to cooperate how they like, based on the preferences they create. People are vulnerable to forces that seek to shape their preferences and narratives for political or economic ends. One way groups help individuals act in the face of uncertainty is through shared conviction narratives which standardise behaviour. These help form regularities in behaviour which policy makers should take into account by considering the relationships between social settings and preferences. These are all regularities on which policy could be built, and in which complementarities could be found between economic, social, education and employment policies, in achieving policy outcomes which meet human needs.

The meso level (in-between micro and macro) is often ignored, but might be important in understanding how the micro aspects relate to the macro aspects and vice versa. A new institutional economics way of thinking may be useful in understanding how forms of social decision making loopback into society to affect preferences and group behaviour in ways that current analytical models do not describe. Anthropology has made progress in tracking these kinds of unintended effects, and it would be interesting to model these kinds of processes within institutions, and the subsequent impacts on social policy.

This way of thinking would have massive implications for policy making, even in the simplest of models. Policy makers in central banks use models to predict outcomes such as the interest rate as determined by preferences. If we instead focus on how policy makers want to drive outcomes and how the system responds to those initiatives then a very different way of thinking about economics compared to the conventional view would be used.

On the history of narrative models, what distinguishes good narrative models from bad ones is coherence. It is possible to use narrative models to make good predictions. Quick, tidy narratives are often used preferentially to those which require detailed study and are very slow. If we use narratives that are quick but which make no sense, then what is the narrative? Is it post-hoc rationalisation, or is it the driver of decisions? And how do narratives win out?

One way of measuring narratives was taken by a group at UCL by examining published texts on the economy. Having understood that it is the emotion in narratives that are important, you can then use changes in the texts as indicators of shifts in the narratives.

## Credit or Financial Cycles

This session began by suggesting we divide instability into smaller components such as low/high frequency shocks and policy shocks. Over the few decades leading up to the crisis, the role of credit and finance did not receive the attention it deserved. The crisis clearly highlighted this mistake and refocused people's efforts. We've already had the financial accelerator of Bernanke, Gilchrist, and so on; and in the developing markets, people have been forced to look at balance of payments issues. Currency, balance of payments and financial crises outside the US are often looked at systematically.

It has become common to talk about data as theory, but science is about data, not just introspection. There was a lack of theorising, but there was also a shortage of data. These phenomena were there, and not merely in an analytical box. The hope is that part of the achievement of this project is to have more and better data.

Looking at where there has been progress: on the empirical side, with a decade of effort, seventeen countries can now provide 145 years of data on financial crises. Work has been done on trying to build the balance sheets of banks, going back to the 1870s, and establishing how macroeconomic models would have worked if they had been based on this actual data.

In terms of new theoretical directions at the household, banking and firm level, some interesting new approaches are emerging. Behavioural macroeconomics is being considered by looking at the cognitive biases and misperceptions which people have, in an attempt to move toward more realistic approaches, and invoking transactional rigidities as sources of crises.

Anthropologists have been writing a lot about debt in recent years. They have found that the character of credit changes massively over time. There has been a move away from localised relationships, where people have access to credit through social networks, to the kinds of valuations and credit ratings that characterise the modern western market. It is important to further investigate the causality of credit crises, the qualitative form of credit crises, and the ways in which things change.

There has been one huge change in particular: lending was once two-thirds commercial and is now two-thirds household. In present times, mortgage credit is crucial. This can be graphed as a financial "hockey stick" since World War II – and all of it is now more unstable: banks invest far less in industrial plant, and far more in housing stock. There have been substantial changes in the way that credit is allocated, and the uses of credit history in this process.

It was suggested that norms have been created by those who benefit from credit easing, especially banks. Using advertising and other publicity, they have changed preferences towards credit use, for their gain. In talking about solutions to financial crises, debt is often taken as given; but once it is understood that a lot of debt was created to make money, the question can be asked as to whether token-based money, including digital currencies, would be a preferable approach to debt-based money in terms of managing economic cycles. In the run-up to the financial crises, investment banks continually misrepresented the quality of their products, and yet no-one has gone to prison. The legal profession appears to be lagging behind the complexity of financial products.

It is tempting to go back and fit new ideas into old framework, by seeing finance as a friction. Yet finance accelerates economic transactions. New relationships, based on money being anchored in debt, are not well described in current macroeconomic models. Achieving an understanding of the elasticity of bank-created money is one of the most important current objectives. The plea for data is never-ending and there is a risk of looking for new answers in the same place. Most banking crises

start in shadow banking, and then spread into formal banking; but it is harder to obtain data from the shadow sector.

### **Secular Stagnation and Balance Sheets**

Economists sometimes follow false paths for long periods, and then revert rapidly to their previous starting positions. The Wickesellian description of business cycles by Authur Pigou is one such idea economists believed for a long period. The crisis then challenged some people's confidence in this view with a resurgence in Keynes. Pigou differs from Keynes in that Pigou's vision is of a self-stabilizing system, which never moves very far from its rest point, as in the rocking horse analogy. In 1929, following the stock market crash, unemployment went from 3% to 25% in the space of three years, and did not go below 15% for a decade. It is difficult to interpret this as a small deviation from a steady state.

Keynes described what he called animal spirits as a spontaneous drive to optimism on the part of investors, which if lost could see the economy stuck forever at high levels of unemployment. This interpretation of Keynesian economics lasted into the 1950s, but changed in 1955, when Samuelson introduced the idea of the neoclassical synthesis: the economy Keynesian in the short-run, classical in the long-run, and the difference between the two describes price adjustment. At around the same time, Philips published his paper recognising a stable relationship in UK data between unemployment and price inflation and Samuelson saw this as the link between the short run and the long run. However, that stable relationship disappeared shortly afterwards; but it was not removed from macroeconomic models.

The emergence of stagflation was inconsistent with the Philips model, was a blow to the Keynesian economics of the time. We went back to Pigou based ideas with Kydland and Prescott's 1982 paper on Real Business Cycle (RBC) theory. After 1982, other shocks were gradually added into the RBC model, reaching the Smets-Wouters version in 2007. This model is basically a mathematical description of everything in Pigou, at a contrast with Keynesian economics. The 2008 crisis might have had the same effect on the classical model: we need to go back and put the mathematics into Keynes. What we are missing is the idea that we can get stuck, and not temporarily but permanently, in some sub-optimal position away from a steady state. Psychology may be the missing piece of this puzzle.

Despite the mistakes which have clearly been made, there are some good pieces in modern Macroeconomics, including the concept of individual behaviour as a guide to what is and what is not a good intervention. Grounding models in microeconomic theory offers the possibility of explaining why a Treasury or a Central Bank could do something more effectively the private sector.

Heterogeneous agent modelling might be useful to this effect. The biggest role of heterogeneous agents is that trading in financial markets involves not just engagement with those who are alive today, but with people who will be alive in the future. Continuity is provided by government agencies, which can allow interventions that permit individuals to trade with each other across time.

Pigou's book has a strong awareness of the role of credit and it is important to get the role of credit right in constructing a macroeconomic model. Credit represents one half of a relationship, which also includes asset valuation. When assets (such as housing) are valued too highly, then debt increases too fast. Debt changing rapidly tends to be a driver for both asset prices and other macroeconomic indices such as unemployment.

The Keynesian knee-jerk response to a recession is a big stimulus in the form of government spending. But if a problem arose in the financial markets, then perhaps the solution lies there as well. If consumption depends upon wealth, then intervening in the asset market to manage aggregate wealth and debt, then we might have a better chance of success in both preventing crises and responding to those that have occurred.

The growth of the financial sector may undercut the role of government to play the role of mediator in representing future generations. The globalisation of production coupled with the politics of austerity makes it hard for individual countries to implement positive economic strategies on their own; co-ordinated international action might be necessary in such circumstances.

A fascinating discussion had taken place about narratives and social relations, Keynesian theory, and the approach for macroeconomics. What was missing was an intersection between those conversations. There was now a question of whether knowledge gained by psychologists could be put into economic models. All economists talk about begins with utility maximisation, but in reality it is different, that is not how people move. Marrying these two modes of thought is going to be difficult, but perhaps it is best to start with simple, small steps.