PPOL 5220: Complex Systems for Policy
Spring Semester, AY 2021-22

Standard economics, arguably the main theoretical cornerstone of public policy, usually starts with the assumption of *rational agency*. Agents are assumed to maximise their individual interests, their preferences are transitive, their discount rates are consistent across time, and they make deliberate decisions using cost-benefit calculations. But a growing body of evidence suggests that human behaviours in a variety of situations not only deviate from these assumptions, but they do so in systematic and predictable ways. These deviations may be due to behavioural biases (such as our asymmetric responses to gains and losses, our subjective weighting of probabilities, etc), cognitive limitations (such as inattention or inertia), and social norms and influences. Policy analysis based only on the standard assumptions of neoclassical economics may therefore lead to the wrong conclusions and/or overly simplistic policy recommendations.

Standard economics is also often based on the assumption that *markets tend towards equilibrium*, that individually optimal actions lead to collectively optimal outcomes, that our expectations about the future are (on average at least) rational, and that the future can be modelled based on calculable risks. These assumptions imply that the economy is a mechanical system that can (and should be) be engineered and precisely designed or calibrated. But the experience of persistent boom-bust cycles, of collective action problems, and of inherent uncertainty in much of our economic lives suggest that we need a different way of studying and analysing the market economy. The course will suggest that the economy is a **complex adaptive system** made up of many interconnected agents (households and firms) which are interacting with each other and adapting to the environment. This also means that the economy cannot be easily reduced to a set of stable and predictable causal relationships the way standard economics assumes.

This course examines the various ways in which the market economy departs from the assumptions of neoclassical economics. It draws on economic traditions *other than* neoclassical economics to analyse complex adaptive systems (of which the market economy is an example) and highlights the policy implications and applications of such an understanding.

In the first half of the course, we critique the neoclassical economics assumption of rational agency and examine the various **behavioural biases and cognitive limitations** that are important for policy analysis and formulation. Students will be exposed to the key concepts in behavioural economics and their applications in areas such as finance, health, retirement, the environment, transport, etc. We examine how people's bounded rationality, bounded willpower, and bounded self-interest can affect their choices and behaviours, how behavioural considerations can improve policy design, and how public policy should incorporate the insights of behavioural economics.

In the second half of the course, we study other aspects of the *economy as a complex adaptive system*. As a complex adaptive system, the economy is characterised (often) by **disequilibrium**, **interconnectedness** (or networks), **emergence**, and **evolution**. To

illustrate and analyse these concepts, we look at industrial and economic development, inequality, the pandemic, and political polarisation through the lens of complexity.

Instructor: Professor Donald Low
Class: Thursday, 19:00 – 21.50
Consultation: Thursday, 17:00 – 18:00

Assessment

- Reading summaries (for **any 5 of the classes**, of **at least 3 pages per summary**): 10% of final grade. Reading summaries for the class are to be submitted *before* the start of that class.
- Group presentation (3 members per group, 15 minutes per group; **10 Mar**): 10%
- Mid-term examinations (**24 Mar**): 35%
- Individual participation in class: 15%
- Term paper* (due on **24 May**): 30%

*The term paper shall take the form of a **policy brief** jointly written by no more than two students per group applying behavioural insights and complexity thinking to a policy issue of the students' choice. The brief should be no more than 1,500 words if written individually, and no more than 2,000 words if written by a pair. The policy brief should first *articulate and explain* the policy issue/problem (focusing on why it is a complex one), draw on some of the key ideas taught in this course to *analyse* the issue/problem, and propose one or two high-level approaches for policymakers to think about or address the issue/problem.

The course week-by-week

Class	**Topic**	**Readings**
1 (10 Feb)	Introduction to behavioural economics and complex systems How behavioural economics differs from standards economics, Part I	1. The Economist, "It's complicated: How economists are grappling with the unpredictable outcomes of simple interactions", 6 April 2019. (https://www.economist.com/finance-and-economics/2019/04/04/simple-interactions-can-have-unpredictable-consequences) 2. Richard Thaler and Cass Sunstein, 2008. "Nudge: Improving Decisions about Health, Wealth and Happiness", Introduction, Ch 1-3 3. Eric Beinhocker, *The Origin of Wealth: Evolution, Complexity, and the Radical Remaking of Economics*, 2006, Ch 1 (supplementary)
2 (17 Feb)	How behavioural economics differs	1. World Development Report 2015, Overview chapter

	from standard economics, Part II	2. Daniel Kahneman, *Thinking Fast and Slow*, Introduction to Ch 9 3. Eric Beinhocker, *The Origin of Wealth: Evolution, Complexity, and the Radical Remaking of Economics*, 2006, Ch 2 (supplementary)
3 (24 Feb)	How behavioural economics differs from standard economics, Part III	1. World Development Report 2015, Ch 1-3 2. Richard Thaler, 1999. "Mental accounting matters", *Journal of Behavioral Decision Making*, 12:183-206.
4 (3 Mar)	Applying behavioural economics in public policy	1. The Behavioural Insights Team, 2014. "EAST: Four simple ways to apply behavioural insights". 2. Ravi Menon, 2011. "How Singapore uses behavioural economics", http://heresthenews.blogspot.com/2011/11/how-singapore-uses-behavioural.html 3. Cass Sunstein, "Nudges that fail", Behavioural Public Policy (2017), 1: 1, 4–25 4. Raj Chetty, 2015. "Behavioral economics and public policy: a pragmatic perspective", *American Economic Review: Papers and Proceedings*, 105(5):1-33.
5 (10 Mar)	Group presentations 1. Health 2. Retirement savings 3. Investing 4. Pandemics 5. Vaccines 6. Climate change and the environment 7. Consumer behaviours 8. Transportation 9. Consumer behaviours	1. World Development Report 2015, Ch 4-9
6 (17 Mar)	Organisation behaviour and the biases of professionals	1. Daniel Kahneman, "Don't Blink! The Hazards of Confidence", *New York Times Magazine*, 19 October 2011.

		(https://www.nytimes.com/2011/10/23/magazine/dont-blink-the-hazards-of-confidence.html) 2. Daniel Kahneman, "Thinking, Fast and Slow", 2011, Farrar, Straus and Giroux. Chapters 23-24 3. World Development Report 2015, Ch 10 4. The Behavioural Insights Team, 2018. "Behavioural Government: Using behavioural science to improve how governments make decisions, Executive Summary.
7 (24 Mar)	Mid-Term Exams	
8 (31 Mar)	Key Characteristics of Complex Adaptive Systems, Part I	1. Beinhocker, Ch 3-4 2. Eric Beinhocker, "How the Profound Changes in Economics Make Left Versus Right Debates Irrelevant", https://evonomics.com/the-deep-and-profound-changes-in-economics-thinking/
9 (7 Apr)	Key Characteristics of Complex Adaptive Systems, Part II	1. Beinhocker, Ch 5-7
10 (14 Apr)	Key Characteristics of Complex Adaptive Systems III	1. Beinhocker, Ch 8-9
11 (21 Apr)	Economic development through the lens of complexity	1. Ricardo Hausmann, "In Search of Convergence", Project Syndicate, 20 Aug 2014 2. Hausmann, Hidalgo, et al., "The Atlas of Economic Complexity: Mapping Paths to Prosperity", 2014 (Executive Summary) 3. Mariana Mazzucato, 2013. "The Entrepreneurial State: Debunking Public vs Private Sector Myths", Chapters 2-3
12 (28 May)	Inequality through the lens of complexity	1. Robert Frank, 2016. "Success and Luck: Good Fortune and the Myth of Meritocracy", Chapters 5-6. (Also, watch video at https://www.youtube.com/watch?v=4smxz38IHRA). 2. Robert Frank, 2016. "Are You Successful? If So, You've Already Won the Lottery", New York Times, 20 May 2016, https://www.nytimes.com/2016/05/22/upshot/are-

		you-successful-if-so-youve-already-won-the-lottery.html. 3. Bo Rothstein & Eric M. Uslaner, 2005. "Equality, Corruption, and Social Trust", World Politics, Vol. 58, No. 1 (Oct 2005), pp. 41-72.
13 (5 May)	Identity politics and political polarisation through the lens of complexity	1. Elizabeth Kolbert, "Why Facts Don't Change our Minds", *New Yorker*, 27 February 2017. (https://www.newyorker.com/magazine/2017/02/27/why-facts-dont-change-our-minds) 2. Mikko Manner and John Gowdy, 2010. "The evolution of social and moral behaviour: Evolutionary insights for public policy", *Ecological Economics*, 69: 753-761.
14 (self-study)	Finance through the lens of complexity	1. Andrew Haldane, Rethinking the Financial Network, 2009 2. Andrew Lo, "Adaptive Markets: Financial Evolution at the Speed of Thought", Ch 2-4, 6