An Advanced Course On The Science and Art of DSGE Modelling

Day 3: Classical Heterogeneous Agent Models

Szabolcs Deák

Kirill Shakhnov

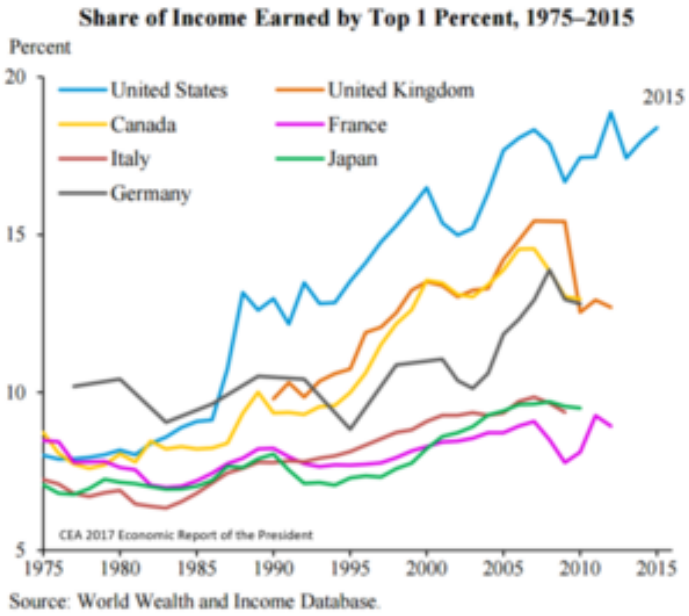
Hyungseok Joo

September 2021

Introduction

Introduction

- If you google the term 'Economic inequality', one of the top hits among images is this graph from Wikipedia:



- It shows that:
  - There is considerable income inequality within countries.
  - It has been steadily growing in the last 40 years.

Introduction

- Oxfam (the Oxford Committee for Famine Relief) collects data on wealth around the globe every year.
- One of the wealth inequality measures they use is how many of the wealthiest individuals hold as much wealth as the bottom half of humanity:

2010	2014	2015	2016	2017
388	85	80	62	8

- Which demonstrates again that there is considerable and growing wealth inequality in the world.

Introduction

- There are questions we cannot address using a representative agent model. Some examples are:
  - Kaplan and Violante (2018): Do household heterogeneity and market incompleteness matter for the response of the economy to aggregate shocks?
  - Glover et al. (2020): What is the optimal mitigation policy during a pandemic when redistribution and mitigation policies interact?

Introduction

- Heterogeneity can also change conventional arguments obtained from representative agent models:
  - Kaplan et al. (2018): What is the transmission mechanism from monetary policy to household consumption?
  - Holter et al. (2019): How does tax progressivity and household heterogeneity affect Laffer Curves?
  - McKay and Reis (2016): Are the automatic stabilizers effective at reducing the volatility of macroeconomic fluctuations?

Goal and Scope of Day 2

- It provides an introduction into the general equilibrium approach to modelling wealth and income heterogeneity in macroeconomics.
- In particular, it provides an overview of the quantitative tools needed to understand the workhorse models of the field: the Aiyagari model and the Krusell and Smith (KS) model.
- By the end of the day you should know
  - How to solve the model of Aiyagari.
  - How to solve the model of Krusell and Smith.
  - Where to find further resources.

Road Map

- Model Economy
- Exercises 1, 2 and 3
- No aggregate uncertainty: Aiyagari model
- Exercises 4 and 5
- Aggregate uncertainty: Krusell-Smith model
- Alternative solution methods
- Exercise 6