Introduction

- Approach based on abstract models, as opposed to focusing on institutional details.

- Models are simplifications, therefore they focus on relevant features for the problem at hand, abstracting from other, less important, ones.

- Build and use simple overlapping generations models of money to answer such basic questions in monetary economics as:
  - How does money promote exchange?
  - What should serve as money
  - What causes inflation?
  - What is the cost of inflation?
Demanding money

- We will develop a simple model of money, designed to answer the most basic question in monetary economics: why do people hold money?

- Intrinsically worthless pieces of paper can have value by providing a means to acquire goods one does not possess. Because of this, the introduction of money improves welfare.

- What distinguishes the demand for money from the demand for other goods? People do not consume money, they use it as a medium of exchange.
Overlapping generations

- Modeling this distinction requires two features:
  1. It must be hard to directly exchange goods in the absence of money.
  2. Someone must be willing to hold money from one period to the next.

- To model these facts we will use an overlapping generations model:
  - people live for two periods.
  - In the first period they are young, in the second, old.
The basic model

- The economy begins in period 1.

- In each period $t \geq 1$, $N_t$ individuals are born. We call these people the future generations.

- In period 1 there are $N_0$ people already alive. We call them the initial old.

- Each individual receives an endowment, $y$, of the consumption good when young, and nothing when old.
Preferences

Individual’s draw utility (satisfaction) from consuming the economy’s sole commodity when young and old.

Assumptions about preferences:

1. Individuals are able to rank any combinations of consumption today and tomorrow \((c_{1,t}, c_{2,t+1})\).

2. Utility is increasing in consumption in both periods.

3. Individuals like to consume in both periods of life.

4. Individuals value consumption in a period more if its relatively scarce.
Indifference curves

- To portray an individual’s preferences graphically, we use the concept of an **indifference curve**.

- This curve exhibits a **diminishing marginal rate of substitution** (assumption 4 above).

- A group of indifference curves is called an **indifference map**.

- Individual preferences are transitive, meaning that indifference curves **cannot cross**.

- The initial old only care about their consumption when old (the more the better).

- Future generations want to acquire goods that they do not have. They have goods when young, but not when old.
Feasibility constraint

- Suppose our job is to allocate available goods among young and old.
- In every period $t$, we cannot allocate more than the total goods available in the economy: $N_{ty}$.
- Suppose every member of generation $t$ is given the same lifetime allocation $(c_{1,t}, c_{2,t+1})$.
- This means total young consumption is $N_t c_{1,t}$, while total old consumption is $N_{t-1} c_{2,t}$.
- Our feasibility constraint as central planners is:

\[ N_t c_{1,t} + N_{t-1} c_{2,t} \leq N_{ty}. \]
Stationarity

- If the number of people born in each period is constant \( N_t = N \) for all \( t \), this becomes:

  \[ c_{1,t} + c_{2,t} \leq y. \]

- For now we will be concerned with **stationary allocations**, where \( c_{1,t} = c_1 \) and \( c_{2,t} = c_2 \) for all \( t \). Note that this does not mean \( c_1 = c_2 \).

- The **feasibility constraint** becomes:

  \[ c_1 + c_2 \leq y. \]

- The **feasible set** is the set of allocations that obey the above inequality, all the possible allocations.
An indifference curve
An indifference map

[Diagram showing indifference curves labeled U^0, U^1, and U^2 with points A, B, and C, and a direction of increasing utility indicated.]
Indifference curves cannot cross
Feasibility constraint