CHAPTER-8

A. OBJECTIVE OF THIS CHAPTER

In this chapter, we will focus on the following issue:

- Two period General equilibrium model where we will focus on:
  a) Inter temporal decisions of the consumer(consumption today vs consumption tomorrow)
  b) Analyze Consumption- Savings decisions.
- Applicability of Ricardian equivalence theorem(under certain conditions, size of the government debt is irreverent)
- Determination of real interest rate as the only price relevant for this economy.
- Focus on consumption smoothing

B. TWO PERIOD MODEL OF THE ECONOMY

1. Basic idea and building blocs

- A consumer’s consumption saving decision is fundamentally a tradeoff between consumption today and consumption tomorrow.
- By savings a consumer gives up some consumption in exchange for assets in the present to consume more in the future.
- Consumer can **dissave** by borrowing more today to gain more consumption today. But by doing so, he sacrifices future consumption when the loan is repaid. Borrowing is thus **negative savings**
- A consumer’s consumption-savings decision is a dynamic or intertemporal decision (as opposed to a static consumption-leisure decision).

2. Consumer of our model

- We assume the consumer starts with no asset at the current period
- The consumer has two choices to make. How much to consume in current period and how much to save in current period. His current period's budget constraint looks like:

$$c + s = y - t \text{ ------ } (1)$$

Here t is the lump sump tax the consumer pays in current period. The right hand side of the above equation is just **disposable income.**

  - If $s \succ o$, the consumer is a lender to the credit market (for example, firms are borrowing this savings to use as Investment I in their firm).
  - If $s \prec o$, the consumer is a borrower to the credit market.

- We assume that there is a financial market where assets are traded. The asset that is traded in this market is called **bond**.
  - Bond can be issued by either the consumer or the government.
  - If the consumer lends, he buys bond. If the consumer borrows, he sells bond.
  - There are two important **assumptions** about he bond market:
    - Bonds are **indistinguishable**. This means no consumer defaults on their debts and hence, **there is no risk associated with any bond.**
    - Bonds are traded **directly** into the credit market. Hence there is no transaction cost in the asset market.

- One bond issued in the current period is a promise to pay $(1+r)$ units of consumption tomorrow.
    - **Assume** $r \succ 0$. Thus there is an incentive to save.
    - r is the real interest rate at which the consumer can borrow.
    - Since 1 unit of consumption today can be traded for $(1+r)$ units of consumption tomorrow, the relative price of tomorrow's consumption with respect to today's consumption is just $\left(\frac{1}{1+r}\right)$.
- We **assume** that the borrowing and the lending rate in the financial market is the **same** which is equal to r.
- In future, assume the consumer's disposable income is given by $y^{'} - t^{'}$. In addition to that the consumer also receives some return on his savings. His principal plus return on savings look like $(1+r)s$. Thus the budget constraint for the consumer in future look like:

$$c^{'} = y^{'} - t^{'} + (1+r)s \text{ ------ } (2)$$

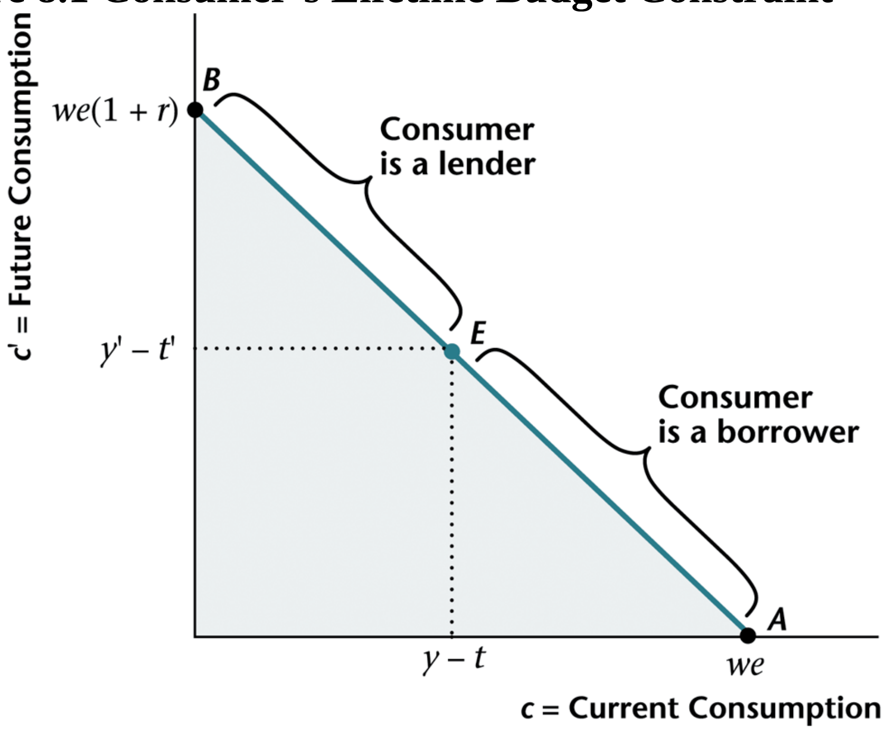
- Consumer makes three decisions:
    - How much to consume today?
    - How much to consume tomorrow?
    - How much to save today?
- From (2): $s = \frac{c^{'} - y^{'} + t^{'}}{(1+r)}$ ------(3)
- Plugging the value of s from (3) into (1):

$$c + \frac{c^{'} - y^{'} + t^{'}}{(1+r)} = y - t \Rightarrow c + \frac{c'}{(1+r)} = [y-t] + \left[\frac{y^{'}}{(1+r)} - \frac{t^{'}}{(1+r)}\right] \text{ ---- } (4)$$

Equation (4) is called the **lifetime budget constraint** or the **intertemporal budget constraint** of the consumer where the LHS is the **present value** of life time consumption and the RHS is the **present value** of life time disposable income.

- Assume lifetime income, $[y-t]+\left[\frac{y'}{(1+r)}-\frac{t'}{(1+r)}\right]=we$. Then equation (4) can be written as :
$c+\frac{c'}{(1+r)}=we \Rightarrow c=-(1+r)c'+we(1+r)$ -----(5)

Figure 8.1 Consumer's Lifetime Budget Constraint



- Graphically, we represent equation (5) as the lifetime budget constraint of the consumer. We see the following:
  - Slope of the budget line is -$(1+r)$.
  - Point E is called the **Endowment point**, which is the consumption bundle the consumer gets if he does not save and just consume disposable income of each period. So at point E, $c=y-t$ and $c'=y'-t'$.
  - At any point along BE, $s \geq o$ because $c \leq y-t$. So, along BE, the consumer is a **Lender.**
  - At any point along AE**,** $s \leq o$ because $c \geq y-t$. Therefore, along AE, the consumer is a **Borrower**.