1. OBJECTIVES

The model we did before (Ch.3/ 4.1) did not include any markets for financial assets. As a consequence, a fundamental variable in any Economy as the interest rate, was not taken into consideration. In Chapter 5, Financial Markets are introduced.

3 MAIN ISSUES:

- LOOK AT THE DEMAND AND SUPPLY OF MONEY AND BONDS;
- DETERMINE THE INTEREST RATE IN THE ECONOMY;
- ROLE OF THE CENTRAL BANK IN THAT DETERMINATION;

2. SOME TERMINOLOGY

INCOME: What you earn per unit of time.

SAVING: Part of the after-tax income that is not consumed.

SAVINGS: All the accumulated saving at a moment in time (same as WEALTH)

WEALTH: All your financial assets minus all your financial liabilities.

STOCKS vs FLOWS

INVESTMENT vs FINANCIAL INVESTMENT

3. MONEY vs BONDS
**ASSUMPTION:** In this Economy, there are only two types of assets:

- **MONEY**
  - Can be used for transactions
  - Pays zero interest

- **BONDS**
  - Cannot be used for transactions
  - Pays a positive interest rate \(i\)

**PEOPLE FACE A CHOICE:**

HOW MUCH OF THEIR WEALTH TO HOLD IN **MONEY**?

HOW MUCH OF THEIR WEALTH TO HOLD IN **BONDS**?

CLEARLY, YOU SHOULD HOLD BOTH, BUT IN WHAT PROPORTIONS?

**THE DEMAND FOR MONEY**

\[ M^d + B^d = \text{$WEALTH$} \]

- **\( M^d \)** - Aggregate Demand for Money
- **\( B^d \)** - Aggregate Demand for Bonds
- **\$WEALTH** - Fixed in time.

MONEY DEMAND IN THE ECONOMY DEPENDS ON

- Overall level of transactions in the Economy
- Interest Rate

**ASSUMPTION:** Level of transactions is proportional to nominal Income \[$Y]\)

WE THEN WRITE:
\[ M^d = \$Y \cdot L(i) \]

GRAPHICALLY:

VELOCITY OF MONEY - \( \frac{Y}{M^d} \)

THE DEMAND FOR BONDS

DEMAND FOR BONDS AND DEMAND FOR MONEY ARE INTERDEPENDENT. LOOK AT THE DEMAND FOR BONDS IMPLIED BY THE DEMAND FOR MONEY.

\[ B^d = \text{WEALTH} - M^d = \text{WEALTH} - \$Y \cdot L(i) \]
WE SHALL WORK WITH THE DEMAND FOR MONEY AND THINK OF THE EQUILIBRIUM CONDITION IN FINANCIAL MARKETS AS THE CONDITION THAT THE DEMAND FOR MONEY EQUALS THE SUPPLY OF MONEY. BUT WE COULD WORK WITH THE CONDITION DEMAND BONDS = SUPPLY OF BONDS AS AN EQUILIBRIUM CONDITION.

4. THE DETERMINATION OF THE INTEREST RATE

WE NEED TO LOOK AT THE SUPPLY SIDE FOR MONEY

ASSUMPTION: Money is supplied only by the Central Bank, that is all Money is currency.
ASSUMPTION: Stocks of Money and Bonds are both given.

\[
M + B = \text{WEALTH}
\]

\(M, B\) - Stocks of Money and Bonds, respectively.

EQUILIBRIUM CONDITION IN FINANCIAL MARKETS

\[
\text{MONEY SUPPLY} = \text{MONEY DEMAND (a)}
\]

(We’ll use this one)

or

\[
\text{BONDS SUPPLY} = \text{BONDS DEMAND (b)}
\]

\[
(a) \iff M = Y \cdot L (i)
\]
THE EFFECTS OF AN INCREASE IN NOMINAL INCOME ON THE INTEREST RATE

MONETARY POLICY AND OPEN MARKET OPERATIONS

HOW THE CENTRAL BANK ACTUALLY CHANGES THE MONEY SUPPLY AND WHAT HAPPENS IN FINANCIAL MARKETS.

THINK OF THE CENTRAL BANK AS CHANGING THE STOCK OF MONEY IN THE ECONOMY BY BUYING AND SELLING BONDS IN THE BOND MARKET.

===>> 'OPEN MARKET OPERATIONS'

EXPANSIONARY vs CONTRACTIONARY OPEN MARKET OPERATIONS
Method 1
Take
(I) \[ Y = 2.5 \left( c_0 + \bar{T} + G - c_1.T \right) \]
and
(II) \[ Y + \Delta Y = 2.5 \left( c_0 + \bar{T} + G + \Delta G - c_1.T \right) \]
Subtract, (II) - (I) to obtain \[ \Delta Y = 2.5 \Delta G \Rightarrow \Delta G = \frac{\Delta Y}{2.5} \]

The Straightforward way

As a rule, you should know that if \[ Y = k (X+Z) \] then \[ \Delta Y = k (\Delta X + \Delta Z) \]
k is a constant and \( X, Z \) exogenous variables.

Note that it is NOT the case that if \( Y = XZ \) then \( \Delta Y = \Delta X. \Delta Z \)

In our specific example: \[ Y = 2.5 \left( c_0 + \bar{T} + G - c_1.T \right), \]
so, \[ \Delta Y = 2.5 \left( \Delta \bar{T} + \Delta G - c_1. \Delta T \right) \]

We assume that \( c_0 \) and \( c_1 \) are constants!!

VERY IMPORTANT: This only works when we have only exogenous variables on the right hand side of our equation. In fact, in our case, \( \bar{T}, G \) and \( T \) are exogenous variables.

We can then apply this rule for solving our problem.

WHAT IS THE MULTIPLIER EFFECT?

Take into consideration the equilibrium condition:

\[
\begin{align*}
Y &= C + I + G \\
Y &= c_0 + c_1 (Y-T) + I + G
\end{align*}
\]