

3. National Income and Equilibrium Determination (Supplement 1)

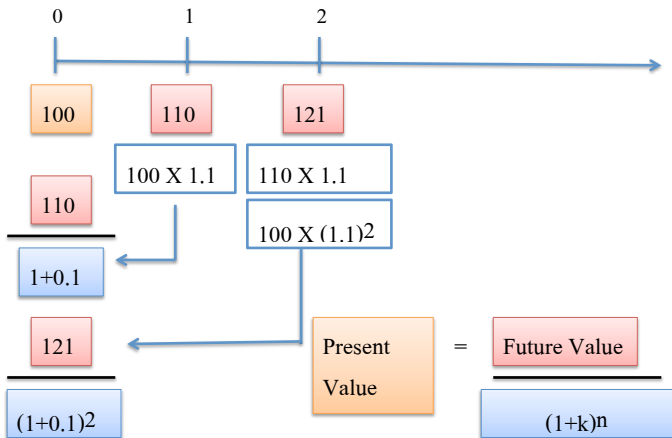
EE 212

Read: Case & Fair, ch. 6; LCR, ch.3, 22

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Investment and Interest Rate

- Autonomous investment is a part of investment that does not depend on National Income (Y).
- Autonomous investment is determined by many factors such as real interest rate, business taxes, technological advancement.
- Investment : pay today and receive returns in the future.
- “Time Value of Money”
- 1 baht at different time has different value
- \$1 received today is worth more than \$1 received tomorrow :
Why?
- “Opportunity Cost”
- We cannot compare \$ (amount) received at different time directly
- We need to compare the value at “the same time”



- Net Present Value (NPV) = Present Value of Returns from Investment - Cost

- $$NPV = \frac{R_1}{1+r} + \frac{R_2}{(1+r)^2} + \dots + \frac{R_n}{(1+r)^n} - \text{Cost}$$

- Investment Decision :

- 1 $NPV > 0$
- 2 $NPV = 0$
- 3 $NPV < 0$

- Marginal Efficiency of Capital (MEC) or Internal Rate of Return (IRR) is the discount rate that makes $NPV = 0$.
- MEC, IRR is the rate of returns on Investment.

- Example 1. You invest by buying machine at Year 0 = 100 Baht. Suppose your machine last only two years. At year 1, you have a return = 0 Bahts. At year 2, you have a return 121 Bahts. Please find IRR or MEC.

- We calculate the rate of returns on investment this way because it takes into account the concept of present value.

- Investment Decision :

① $MEC > r$

② $MEC = r$

③ $MEC < r$

- MEC : The rate of return on one additional unit of physical capital.
- Marginal efficiency of investment (MEI) : The function relates the quantity of desired investment to the rate of interest.

Accelerator Principle

- The principle is based on the idea that demand for investment is the derived demand of demand for output
- K_t^d = Desired Capital Stock at year t . K_t = Actual Capital Stock at year t .
- $I_{n,t}$ = Net Investment at year t . Y_t = Output at year t .
- Assumption.
 - 1 $K_t^d = \alpha Y_t$.
 - 2 $K_{t-1} = K_{t-1}^d = \alpha Y_{t-1}$.
 - 3 $I_{n,t} = K_t^d - K_{t-1}$.
- $I_{n,t} = K_t^d - K_{t-1}$.

$I_{n,t} = \alpha \Delta Y_t$, $\alpha = \frac{I_{n,t}}{\Delta Y_t}$. α is accelerator. $Y \uparrow$ accelerates $I \uparrow$. An increase in the demand for a finished product will create a greater demand for capital goods.