

Chapter 6. A Real Intertemporal Model with Investment (Part 3): A Short Note

*Note that short notes are not enough for the exam. A student should read all lectures and the book.

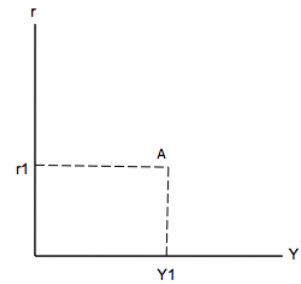
1 Real Intertemporal Model

1. Consumers : supply labour and consume
2. Firms : demand labour, produce and invest

2 Competitive Equilibrium

2.1 Aggregate output supply:

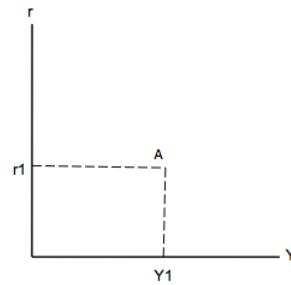
- Aggregate output supply : interest rate and Y^s



- $w \uparrow \Rightarrow Y^s$ shifts (.....) , $z \uparrow$ or $K \uparrow \Rightarrow Y^s$ shifts (.....)

2.2 Current Output Demand

- Current output demand : interest rate and Y^d



- Shifts in current output demand : $G \uparrow, (T, T') \downarrow, Y' \uparrow, z' \uparrow$ or $K \downarrow \Rightarrow Y^d$ shifts (.....)

2.3 Complete real intertemporal model

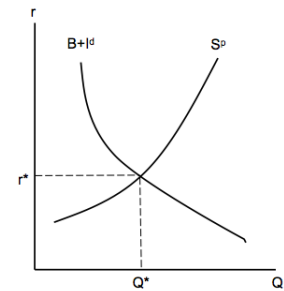
Labour Market



Output Market



Credit Market.



3 Shock Experiments

3.1 Exogenous shocks in the model

3.1.1 Current government purchases increase temporarily (G);

Keynesian(EE212)	Intertemporal model analysis
$G \uparrow \Rightarrow we, C ?$	$G \uparrow \Rightarrow we, C ?$
Balance budget Multiplier 1	Balance budget Multiplier 1
Increases in C and Y come as a free lunch! Each dollar spent by the government increases GDP by more than one dollar. We would let the government grow infinitely large, which would make everyone infinitely wealthy.	Higher government spending and larger output come at a cost — no free lunch! Government expenditure crowds out private investment. Lower future productive capacity. Consumer consumes less and takes less leisure and he or she faces a lower real wage rate.

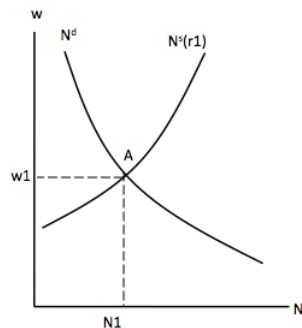
ΔBal = change in balance budget, $\frac{\Delta Y}{\Delta Bal}$ = balance budget multiplier

Intertemporal model analysis

Step 2:

$r \uparrow \Rightarrow N^S \text{ shifts } (\dots\dots\dots) \Rightarrow w \dots\dots\dots$
 $r \uparrow \Rightarrow I^d \dots\dots\dots \text{ and } C^d \dots\dots\dots$

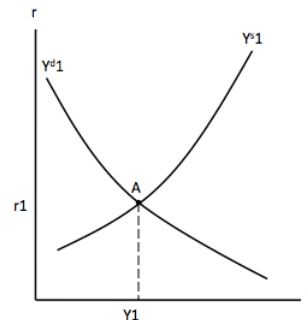
Labour Market



Step 1 :

$Y^s : T \uparrow \Rightarrow N^S \text{ shifts } (\dots\dots\dots) \Rightarrow Y^S \text{ shifts } (\dots\dots\dots)$
 $G \uparrow \Rightarrow we (\dots\dots\dots) \Rightarrow Y^d \text{ shifts } (\dots\dots\dots)$
 Y^d shifts more than $Y^s : r \dots\dots\dots$

Output Market

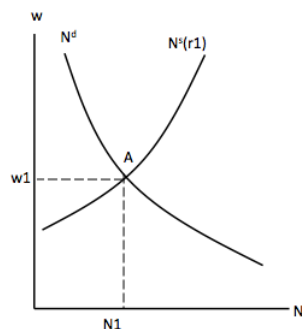


3.1.2 A decrease in current capital stock

Step 2: $K \downarrow \Rightarrow r \dots\dots\dots$

- N^S shifts $(\dots\dots\dots) \Rightarrow w \dots\dots\dots$ (A movement on the Y^s curve)

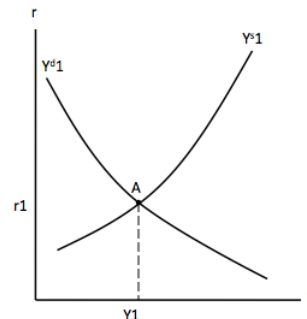
Labour Market



Step 1 :

$K \downarrow \Rightarrow MP_N \dots\dots\dots \Rightarrow N^d \text{ shifts } (\dots\dots\dots) \Rightarrow Y^s \text{ shifts } (\dots\dots\dots)$
 $K \downarrow \Rightarrow K' \dots\dots\dots, MPK' \dots\dots\dots, I^d \dots\dots\dots (\text{shift} \dots\dots\dots) \Rightarrow Y^d \text{ shifts } (\dots\dots\dots)$

Output Market



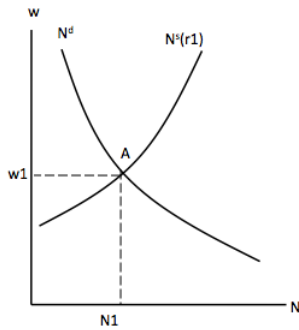
- $K \downarrow \Rightarrow MPK' \dots \Rightarrow I \dots \Rightarrow r \dots \Rightarrow I \dots \Rightarrow$ If $I \downarrow, K' \downarrow$ — impossible. $K \downarrow \Rightarrow MPK \uparrow \Rightarrow I \uparrow$
- A decrease in current $K \Rightarrow r \dots, I \dots, w \dots, \text{Employment} \dots, \text{output} \dots$ (C and ℓ tends to $\downarrow$ because $r \uparrow$)
- “there appears to be empirical cases in which the output supply and output demand effects roughly cancel, for example during large natural disasters such as the Mississippi floods in 1993, and Hurricane Katrina in 2005.”

3.1.3 Equilibrium Effects of an increase in Current Total Factor Productivity

Step 2: the lower r raises current consumption, investment and leisure.

- Labor supply decreases; the labor supply curve shifts left.
- Employment, output and the real wage increase.

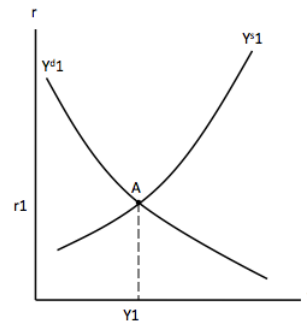
Labour Market



Step 1 : An increase in current total factor productivity (z) raises MPN.

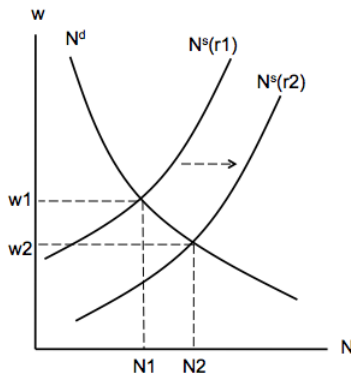
- Labor demand shifts right. Y^s shifts to the right.
- The real interest rate decreases.

Output Market



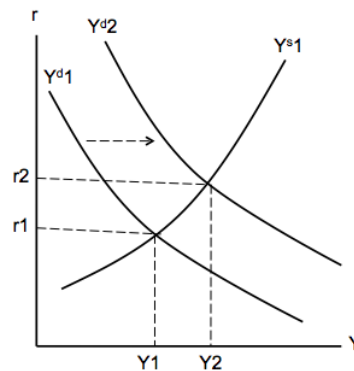
3.1.4 An increase in future z'

Step 2: the higher r reduces consumption, investment and leisure.



Step 1 : Future z' is expected to rise; future MP'_K increases.

- Investment (I^d) increases; output demand shifts right.
- The real interest rate increases.



- Investment increases with higher expected MP'_K , partly offset by the higher r . A larger future capital stock due to higher expected z' .
- Both real interest rate and output increase. Current consumption may rise or fall due to higher income but higher real interest rate. Employment increases with falling real wage.