Department of Economics
Queen's University

ECON 320: Macroeconomic Theory II
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Mid-Term Examination
8:30 am, Wednesday February 24, 2004

Section A(30 percent): Read the following statements and indicate whether they are True, False or uncertain. Briefly explain your answer. NO MARK WILL BE GIVEN FOR UNSUPPORTED ANSWERS. All questions have equal value

A1. Suppose that planned expenditure is given by,

$$Z = C(Y-T) + I(i-\pi^e) + G$$

Holding π^e and i constant, a change in government purchases, when accompanied by an equal changes in taxes, causes the IS curve to shift by a horizontal amount equal to that changes in government purchases

TRUE

Differentiate The Is curve, with respect to G

$$Y = C(Y-T) + I(i-\pi^e) + G$$

$$\frac{dY}{dG} = \frac{\partial C}{\partial (Y-T)}\left[\frac{dY}{dG} - \frac{dT}{dG}\right] + \frac{\partial I}{\partial (i-\pi^e)}\frac{d(i-\pi^e)}{dG} + 1$$

$$\frac{dY}{dG} = C_{Y-T}\left[\frac{dY}{dG} - 1\right] + 1$$

$$\Rightarrow \frac{dY}{dG}\left(1 - C_{Y-T}\right) = 1 - C_{Y-T}$$

$$\Rightarrow \frac{dY}{dG} = 1$$

This can be interpreted as meaning the change in Y for a given I is simply equal to the change in government purchases.

A2. In the pure Keynesian model (with fixed interest rate), equilibrium is achieved through the adjustment of prices so that supply equals demand for every good

False- In the pure Keynesian model, prices are fixed. The adjustment to equilibrium takes place through output adjustment, illustrated in the Keynesian Cross Diagram in figure 1. for example suppose a decrease in interest rate causes aggregate demand to increase from $Z_0(Y)$ to $Z_1(Y)$, so that at Y_0 demand exceeds supply, this implies that inventories are being drawn down. Managers are assumed to respond to this by increasing production (which is possible with no new investment because the economy is operating below capacity) so as to meet the demand at B and restore their planned inventories levels.

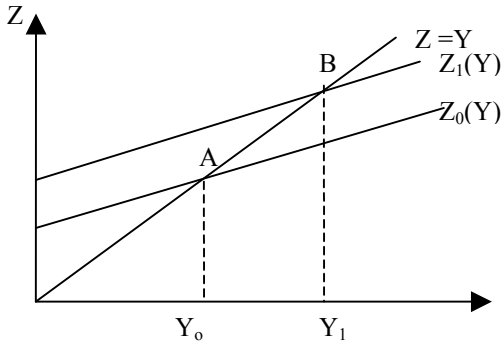
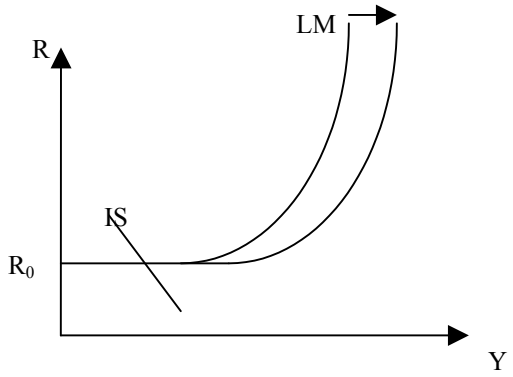


Figure 1

A3. Because of the " liquidity trap", traditional Keynesians are likely to advocate monetary rather than fiscal expansion in response to a deep recession

False- According to the liquidity trap hypothesis put forward by Keynes, when the economy is in a really deep recession due to lack of investment and/or consumption demand, then the economy may not be very responsive to monetary stimulus. The reason is that below some very low level of interest rate R_0 the actual amount money of households firms and households are willing to hold may be quite insensitive to interest rates, and may only depends on the level of expenditures they expect to have. The LM curve may effectively be very flat and an increase in the money supply will simply result in a greater excess supply of money. Traditional Keynesians would , instead, advocate fiscal expansion in an attempt to shift the IS curve upward instead of the LM curve, and push the economy out the liquidity trap.



Section B (30 percent)

B1. Describe how, if at all, each of the following developments affects the break-even and act5ual investment lines in our basic diagram for the Solow model:

a) The rate of depreciation falls.

The slope of the break-even investment line is given by $(n+g+\delta)$ and thus a fall in the rate of depreciation, δ, decreases the slope of the break-even investment line.

The actual investment curve, sf(k) is unaffected.

From the figure 1, we can see that the balanced-growth-path level of capital per unit of effective labour rises from k* to k^*_{new}

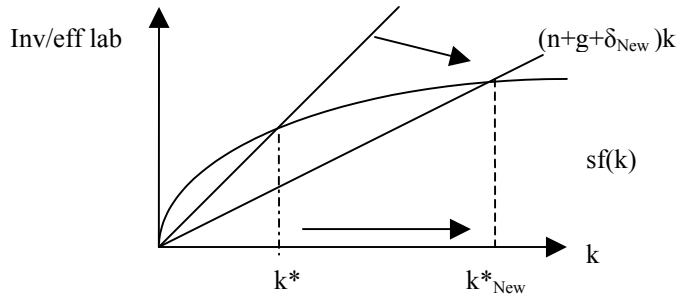


Figure 1

b) The rate of technological progress rises.

Since slope of the break-even investment line is given by $(n+g+\delta)$, a rise in the rate of technological progress, g, makes the break-even investment line steeper.

The actual investment curve, sf(k) is unaffected.

From the figure 2, we can see that the balanced-growth-path level of capital per unit of effective labour falls from k* to k^*_{new}

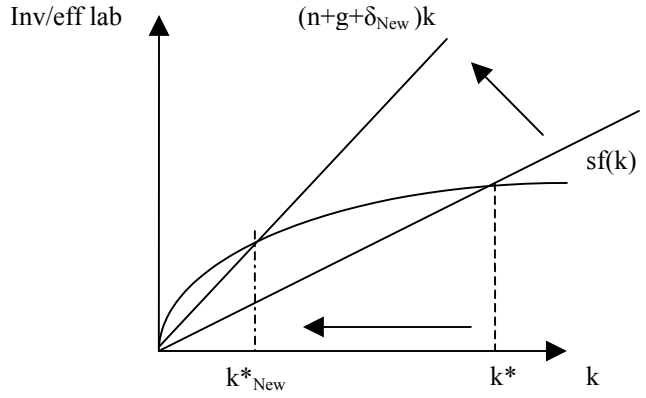


Figure 2

c) Workers exert more effort, so that output per unit of effective labour for a given value of capital per unit of effective labour is higher than before.

The break-even investment line is unaffected. Then workers exerting more effort, so that output per unit of effective labour is higher than before. Actual investment curve shifts upward.

From the figure 3 we can see that the BGP level of capital per unit of effective labor rises from k* to k^*_{new} .

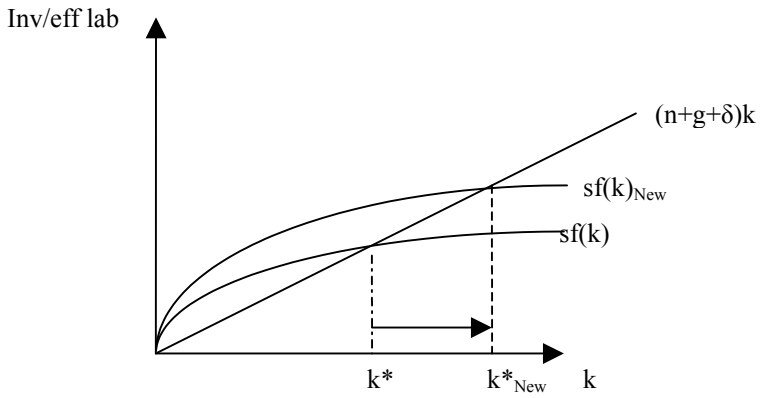


Figure 3

Section C (40%): **Consider the following Keynesian economy**

Desired consumption	$C^d = 200 + 0.8(Y - T) - 200r$
Desired investment	$I^d = 200 - 300r$
Taxes	$T = 50 + 0.25Y$
Government purchases	$G = 152$
Money demand	$L = 0.5\,Y - 200r$
Money supply	$M = 924$
Full employment output	$\overline{Y} = 1100$

a .Derive the IS and LM curves for this economy
The IS curve:

$$Y = C^d + I^d + G$$
$$Y = 200 + 0.8Y - 0.8T - 200r + 200 - 300r + G$$
$$Y = 400 + 0.8Y - 0.8(50 + 0.25Y) - 500r + G$$
$$Y = 400 + 0.8Y - 40 - 0.2Y - 500r + G$$
$$0.4Y = 360 - 500r + G$$
$$Y = 900 - 1250r + 2.5G$$
$$IS: \qquad Y = 1280 - 1250r$$

The LM curve:

$$M = PL(y, r)$$
$$\frac{M}{P} = 0.5Y - 200r$$
$$0.5Y = \frac{M}{P} + 200r$$
$$Y = \frac{2M}{P} + 400r$$
$$Y = \frac{1848}{P} + 400r$$

b. What are the general equilibrium (that is long run) values of output, the real interest rate, consumption, investment and the price level?

$$Y = 1280 - 1250r \Rightarrow 1100 = 1280 - 1250r \Rightarrow r = 14.4\%$$
$$Y = \frac{1848}{P} + 400r \Rightarrow 1100 - 57.6 = \frac{1848}{P} \Rightarrow 1042.4 = \frac{1848}{P} \Rightarrow P = 1.77$$
$$T = 50 + 0.25Y \Rightarrow T = 325$$
$$Y - T = 1100 - 325 = 775$$
$$C = 200 + (0.8 \times 775) - (200 \times 0.144) = 820 - 28.8 = 791.2$$
$$I = 200 - (300 \times 0.144) = 156.8$$

c. Starting from the general equilibrium, government purchases are increased by 62. What are the effects of this changes on output, the real interest rate and the price level in the short run ? and in the long run?

In Short run (A), the price level is constant, P =1.77

IS: $Y = 900 - 1250r + 2.5G \Rightarrow Y = 1435 - 1250r$

LM: $Y = \frac{1848}{P} + 400r \Rightarrow Y = 1044 + 400r$

$$\Rightarrow 1435 - 1250r = 1044 + 400r$$
$$\Rightarrow 391 = 1650r$$
$$\Rightarrow r_1 = 23.6\%$$
$$\Rightarrow Y_1 = 1140$$

In Long run (B), Y=1100

IS: $1100 = 1435 - 1250r$

$$r_2 = 26.8\%$$

LM: $Y = \frac{1848}{P} + 400r \Rightarrow 992.8 = \frac{1848}{P} \Rightarrow P = 1.86$

d. Graphically