

**Endterm Examination**  
IFMR GSB, Krea University (Batch: 2019-21)  
Macroeconomics (Course Code: **ECON502**)  
04 December 2019



**Maximum Points:** 60

**Duration:** 150 minutes

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**Instructions and Advice:**

- This exam accounts for 30% of your final grades.
  - The question paper is divided in two sections- Part A and Part B.
  - You need to answer 6 questions in all. [3 from Part A, and 3 from Part B]
  - You can choose between Question 1 and Question 2, between Question 3 and Question 4, between Question 5 and Question 6.
  - In case you choose to answer Question 1 as well as Question 2 (by accident or by design) in the exam, the first question that you attempt will be evaluated. Same goes for Questions 3 and 4 (and for Questions 5 and 6).
  - All other questions are compulsory.
  - Please be brief and precise in your answers. Unnecessarily lengthy answers will attract penalty.
  - Label all graphs and figures clearly.
  - At no point of this examination you are allowed to ask clarificatory questions. Make reasonable assumption if you have doubts and proceed to answer the question.
  - You are **allowed** to use a non-scientific calculator in the exam.
  - There is plenty of time. Use it wisely, do not rush.
  - All the best! :)
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## Part A

1. (4 points) *Label each of the following statements true, false, or uncertain. Explain briefly. [NOTE: There are no points for answers without explanation.]*

- (a) (2 points) If inflation turns out to be higher than expected, the realized real cost of borrowing turns out to be lower than the real interest rate.

**Solution:** **True.** A higher rate of inflation than expected lowers the realized real interest rate below the contracted real interest rate. The lender loses and the borrower gains.<sup>1</sup>

- (b) (2 points) A monetary expansion will lead to an upward sloping yield curve.

**Solution:** **False.** Monetary expansion leads to lowering of interest rate, and should, in turn, lead to downward sloping yield curve.

**Or**

2. (4 points) *For each of the changes in expectations in (a) and (b), determine whether there is a shift in the IS curve, the LM curve, both curves, or neither. In each case, assume that expected current and future inflation are equal to zero and that no other exogenous variable is changing.*

- (a) (2 points) an increase in the expected future real interest rate.

**Solution:** An increase in the expected future real interest rate will lead to lower investment and the IS curve will move to the left. Movements in LM curve depend upon the current interest rate and there will be no shift.

- (b) (2 points) a decline in the current money supply.

**Solution:** The LM curve shifts to the left.

3. (5 points) Suppose that there is a fall in foreign output. Show the impact on the domestic economy using a graph. What is the effect on domestic output? On domestic net exports?

**Solution:** Lower foreign output means lower foreign demand, including lower foreign demand for locally produced goods. This leads to a fall in domestic output and the domestic demand for goods through the multiplier.

**OR**

4. (5 points) If domestic inflation is higher than foreign inflation, what happens to the real exchange rate over time? What happens to the trade balance over time? Explain in words.

**Solution:** The real exchange rate must **appreciate**. The trade balance over time will deteriorate. Why? As the real exchange rate appreciates, the relative price of the domestic good will start rising (making exports less attractive), and the relative price of the foreign good will start falling (making imports cheaper).

5. (6 points) Consider two economies, one called La La Land, and the other called Wonderland. Construct the balance of payments for each country.

(a) (2 points) La La Land purchased ₹100 in oil from the Wonderland.

**Solution:**  
**Net Exports**  
- ₹100 [La La Land]  
+ ₹100 [Wonderland]

(b) (2 points) Wonderland investors were paid ₹15 in dividends from their holdings of the La La Land equities.

**Solution:**  
**Net Investment Income**  
- ₹15 [La La Land]  
+ 15 [Wonderland]

(c) (2 points) Wonderland investors purchased ₹15 of La La Land government bonds.

**Solution:**  
**Capital Account**  
+ ₹15 [La La Land]  
- ₹15 [La La Land]

Or

6. (6 points) It is an election year, and the economy is in a recession. The opposition candidate campaigns on a platform of passing a tax-rate break, which would be effective next year after she takes office. What impact does this campaign promise have on the following variables:  $Y^e$ ,  $r^e$ ,  $T^e$  under the following scenarios.

(a) (3 points) The central bank will act to prevent any change in future output.

**Solution:** This means that the central bank will increase the interest rate in the future (shift the  $LM$  curve to the left in the future). The expected interest rate will increase more, which tends to shift the  $IS$  curve to the left, but there is still the effect of lower expected taxes on current consumption. The effect today on output is still ambiguous.

(b) (3 points) The central bank will act to prevent any change in the future interest rate.

**Solution:** Future output will be higher, the future interest rate will not increase, and future taxes will be lower. The  $IS$  curve definitely shifts to the right in the current period, and current output increases.

## Part B

7. (10 points) Consider an economy that suffers a fall in business confidence (which tends to reduce investment).

- (a) (5 points) Suppose the economy has a flexible exchange rate. In an  $IS - LM - UIP^2$  diagram, show the short-run effect of the fall in business confidence on output, the interest rate, and the exchange rate. How does the change in the exchange rate, by itself, tend to affect output? Does the change in the exchange rate dampen (make smaller) or amplify (make larger) the effect of the fall in business confidence on output?

**Solution:** The reduction in business confidence shifts the IS curve leftwards. The domestic interest rate declines, so with the foreign interest rate  $i^*$  and the future expected exchange rate remaining constant, the exchange rate depreciates. When the exchange rate depreciates, there is a tiny probability that the net exports may rise. Therefore, some of the damage caused by the fall in investor confidence may be mitigated. **[You need to draw the diagram].**

- (b) (5 points) Suppose instead the economy has a fixed exchange rate. In an  $IS - LM - UIP$  diagram, show how the economy responds to the fall in business confidence. What must happen to the money supply in order to maintain the fixed exchange rate? How does the effect on output in this economy, with fixed exchange rates, compare to the effect you found for the economy in part (a), with flexible exchange rates?

**Solution:** The reduction in business confidence will lead to a leftward shift in the IS curve, putting downward pressure on the domestic interest rate (and depreciation in exchange rate). In this case, we know that the interest rate is fixed, and cannot be changed. So, the central bank will decrease the money supply. The output in this case will be much lower. **[You need to draw the diagram].**

8. (15 points) Consider an open economy characterized by the equations below.

$$C = c_0 + c_1 \cdot (Y - T)$$

$$I = b_0 + b_1 \cdot (Y)$$

$$IM = m \cdot Y$$

$$X = x \cdot Y^*$$

Assumptions: a. the real exchange rate is fixed at a value of 1, b. foreign income ( $Y^*$ ) is fixed, and c. taxes are fixed and the government expenditure is also exogenous.

- (a) (5 points) Write the equilibrium condition in the market for domestic goods and solve for  $Y$ .

**Solution:**

$$Y = C + I + G + NX$$

$$Y = c_0 + c_1 \cdot (Y - T) + b_0 + b_1 \cdot (Y) + G + x \cdot Y^* - m \cdot Y$$

$$Y \cdot [1 - (c_1 + b_1 - m)] = [c_0 + b_0 - c_1 \cdot T + G + x \cdot Y^*]$$

$$Y_{domestic}^{eqib} = \frac{[c_0 + b_0 - c_1 \cdot T + G + x \cdot Y^*]}{[1 - (c_1 + b_1 - m)]}$$

- (b) (5 points) Suppose government purchases fall by one unit. What is the impact on the output? What assumptions do you need on  $m$ ,  $c_1$ , and  $b_1$ ?

<sup>2</sup>UIP stands for the uncovered interest parity condition

**Solution:** You have to assume that  $0 < m < c_1 + b_1 < 1$ . When  $\Delta G = 1$ , the output will go down by the following units. Output increases by the multiplier, which equals  $\frac{1}{[1-(c_1+b_1-m)]}$ .

- (c) (5 points) How do net exports change when government purchases fall by one unit?

**Solution:** When government purchases fall by a unit, net exports go up by

$$m\Delta Y = \frac{m}{[1-(c_1+b_1-m)]}$$

Proof:

$$NX = X - IM$$

$$NX = x \cdot Y^* - m \cdot Y_{domestic}^{eqib}$$

$$NX = \left[ 1 - \frac{1}{[1-(c_1+b_1-m)]} \right] x \cdot Y^* - m \cdot \frac{[c_0 + b_0 - c_1 \cdot T + G]}{[1-(c_1+b_1-m)]}$$

Now, you just need to take one unit change in  $G$  and measure how  $NX$  changes.

9. (20 points) A consumer has nonhuman wealth equal to ₹100. She earns ₹40 this year and expects her salary to increase by 5% in real terms each year for the following two years. She will then retire. The real interest rate is equal to 0% and is expected to remain at 0% in the future. Labour income is taxed at a rate of 25%.

- (a) (5 points) What is this consumer's human wealth?

**Solution:**  $(1 - 0.25)(1 + 1.05 + (1.05)^2)40 \equiv 94.6$

- (b) (5 points) What is her total wealth?

**Solution:** Total wealth = human plus non-human wealth

$$\text{Total wealth} = ₹100 + ₹94.6 \equiv ₹194.6.$$

- (c) (5 points) If she expects to live for seven more years after retiring, and wants her consumption to remain the same (in real terms) every year from now on, how much can she consume this year?

**Solution:** The consumer works for three more years and will be retired for seven years, so there are 10 more years of consumption. So, since the real interest rate is zero, the consumer can consume one-tenth of her total wealth, or ₹19.46, this year.

- (d) (5 points) If she received a bonus of ₹20 in the current year only, with all future salary payments remaining as stated earlier, by how much could this consumer increase consumption now and in the future?

**Solution:** New total wealth = Old total wealth + 20

$$\text{New Consumption} = \frac{\text{New total wealth}}{10}$$

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$$\text{Change in consumption} = \text{New Consumption} - \text{Old Consumption}$$

$$\text{Change in consumption} = 20/10 = ₹2.$$