

ISCTE — INSTITUTO UNIVERSITÁRIO DE LISBOA

MACROECONOMICS – I

Final test

January– 2016

Duration: 2 hours

Group A — The IS function (60 points)

Consider a certain economy, the demand side of which can be characterized by the following setting of equations:

$$\begin{aligned} C_t &= 0.7\bar{Y}_t \\ G_t &= 0.15\bar{Y}_t \\ EX_t &= 0.05\bar{Y}_t \\ IM_t &= 0.06\bar{Y}_t \\ I_t &= [0.16 - 2(R_t - \bar{r})] \bar{Y}_t \end{aligned}$$

where  $\bar{Y}_t$  is the level of potential GDP,  $R_t$  represents the real interest rate, and  $\bar{r} = 4\%$  is the Marginal Productivity of Capital. The remaining symbols represent each individual aggregate on the demand side (Consumption, Government Expenditures, Exports, Imports and Investment).

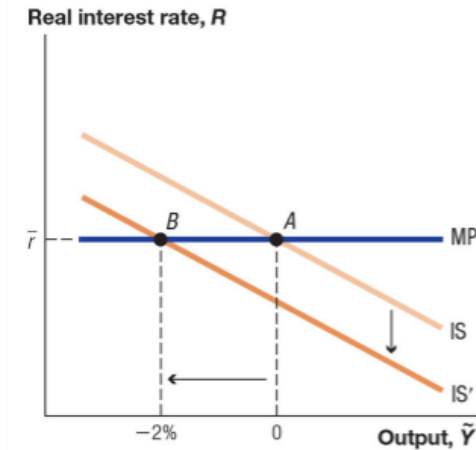
1. Obtain the expression of the IS function and represent it graphically. If  $R_t = 3\%$ , what will be the level of the output gap (short term output)?
2. What happens to the output gap if the government increases public spending by 3 percentage points? Represent graphically.
3. Considering the initial situation, what happens to the output gap if the central bank increases the short term interest rate by 2 percentage points? Represent graphically.
4. Considering the initial situation, what happens to the output gap if  $\bar{r}$  increases to 6%? Represent graphically.
5. Considering the initial situation, what happens to the output gap if the government increases public spending by 3 percentage points and Consumption depends also on the output gap ( $\tilde{Y}_t$ ) as follows

$$C_t = (0.7 + 0.5\tilde{Y}_t) \bar{Y}_t$$

Represent graphically.

Group B — The Great Recession & Short-Run Model (60 points)

**B1. (30 points)** Suppose housing prices had been rising, but then they fall sharply. This decline produces a negative shock upon investment and aggregate demand, causing the IS function to shift downwards as in the following figure.



1. Explain what the Central Bank should do in order to stabilize output at its long term equilibrium. Use graphical analysis in your answer.
2. What are financial frictions and how they affect the working of our macroeconomy?
3. Using the figure above, explain what happens if there is a large financial friction (spread) in the economy, and the central bank tries to get the economy back to  $\tilde{Y} = 0$ .

**B2. (30 points)** — Consider the following Table, which corresponds to the balance sheet of the bank NO LIMITS:

Column A		Column B	
Loans	12000	Deposits	13000
Financial Investments	8000	Short Term Debt	5000
Cash & Reserves	500	Long Term Debt	1000

Taking into account the information above, answer the following questions:

1. What is the total amount of liabilities of this bank, as well as the total amount of net equity.
2. If the reserves requirements rate is 5%, and the ratio of capital requirements is 10%, how do you describe the situation of the bank as far as liquidity and solvability is concerned?
3. What is the leverage ratio of this bank? What does this ratio tells us about the level of risk this banking is taking?

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4. Rewrite the balance sheet in the case 20% of the loans will not be paid back. What is the situation of the bank if that happens?

### Group C — Stabilization in the AS/AD framework (40 points)

**(40 points)** Consider the standard macroeconomic model discussed in the textbook. It includes the three fundamental equations: an aggregate demand function (AD), a monetary policy rule (MP), and an aggregate supply function (AS). Having the following information:

$$\begin{aligned} IS & : \tilde{Y}_t = \bar{a} - \bar{b}(R_t - \bar{r}) \\ MP & : R_t = \bar{r} + \bar{m}(\pi_t - \bar{\pi}) \\ AS & : \pi_t = \pi_{t-1} + \bar{v}\tilde{Y}_t + \bar{o}. \end{aligned}$$

1. Obtain the Aggregate Demand function.
2. Knowing that  $\bar{a} = 0$ ,  $\bar{r} = 3\%$ ,  $\bar{\pi} = 2\%$ ,  $\bar{o} = 0$ , what are the values of both the real interest rate and the inflation rate such that the economy is in its long term equilibrium?
3. Represent graphically such equilibrium.
4. Consider that the economy initially is in its long term equilibrium and is hit by an external oil supply shock, which decreases increases  $\bar{o}$  by 5 percentage points. Knowing that  $\bar{v} = 0.5$ , what will be the next period inflation rate? Is this level of inflation stable over time? Explain using graphical analysis.

### Group D — Exchange Rates and International Finance (40 points)

**D1. (10 points)** What is the "Law of One Price"? Considering the information in the following Table, can you find empirical support for such "Law" (*you do not need to use more than four countries*).

TABLE 20.1		
The Big Mac Index		
	Big Mac price in local currency	Exchange rate per dollar (\$)
United States	4.37 dollars	1.00 dollars/\$
Norway	42.96 kroner	5.48 kroner/\$
Euro area	3.61 euros	0.74 euros/\$
Japan	319.62 yen	91.06 yen/\$
Mexico	36.95 pesos	12.74 pesos/\$
China	15.99 yuan	6.22 yuan/\$
Russia	73.02 rubles	30.05 rubles/\$
South Africa	18.37 rand	9.05 rand/\$
India	89.18 rupees	53.40 rupees/\$

**D2. (30 points)** Consider our short run model of the economy with exchange rates. We derived the IS function with the following equation for Net Exports

$$\frac{NX}{Y} = \bar{a}_{nx} - \bar{b}_{nx}(R_t - \bar{r}) + \bar{b}_{nx}(\bar{R}^w - \bar{r})$$

and obtained the following IS function

$$\tilde{Y}_t = \bar{a} - \bar{b}(R_t - \bar{r})$$

with

$$\begin{aligned} \bar{a} &= \bar{a}_c + \bar{a}_g + \bar{a}_i + \bar{a}_{nx} - 1 + \bar{b}_{nx}(\bar{R}^w - \bar{r}) \\ \bar{b} &= \bar{b}_i + \bar{b}_{nx} \end{aligned}$$

1. What is the economic reason which explains the fact that Net Exports are positively affected by an increase in the foreign real interest rate ( $\uparrow \bar{R}^w$ ) and negatively by an increase in the domestic real interest rate ( $\uparrow R_t$ )
2. Explain graphically what happens if the Fed reduces short term interest rates.
3. Explain graphically what happens if there is an increase in public spending such that  $\bar{a}_g$  increases by 2 percentage points. If NX were not affected by exchange rates would the result be the same? Explain.

**END OF TEST.**