NOVA SCHOOL OF BUSINESS & ECONOMICS

Number: **Name:**

International Macroeconomics

Nova SBE – Fall 2024

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Final Exam 06/12/2024 – Duration: 2h00

I (4.5)

*Define **three** of the following concepts (3-5 lines each):*

i. Official vs Unofficial Dollarization

ii. Foreign Exchange Broker vs Dealer

iii. DD Curve with a Negative Slope

iv. First Generation Speculative Attack

v. Rightwards Shift of the FIX Line

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IV (2)

In each question, choose one (correct answer: +0.5; wrong answer: -0.125):

1. Contrarily to the liquidity crisis, when there is a bank solvency crisis (i) there is no change in the money demand, (ii) there is no change in money supply, (iii) there is no sterilization, (iv) all the above.

2. The price of an exchange rate option will fall down to zero in case: (i) it is a put option and the market exchange rate at maturity falls short the one set in the contract; (ii) it is a call option and the market exchange rate at maturity falls short the one set in the contract; (iii) it is a call option and the market exchange rate at the time of signature falls short the one set in the contract; (iv) none of the above.

3. Under float, departing from a situation with unemployment and trade surplus, achieving internal and external balance simultaneously will require <u>for sure</u>: (i) fiscal and monetary expansion; (ii) fiscal expansion and monetary contraction; (iii) monetary expansion and fiscal contraction; (iv) none of the above.

4. The Capital and Markets Union is the plan to create a single market for capital within the European Union. This will imply <u>for sure</u>: (i) a shift EU's OCA line to the right; (ii) increase in economic integration with less incidence of asymmetric shocks; (iii) an increase in economic integration and a downward shift of the OCA line; (iv) none of the above.

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II (13,5)

Please present the results with, at most, 3 decimal places.

Each subgroup (2A and 2B) must be answered in a different sheet.

II.A. Consider AC/DC, an economy with **sticky prices** under **float**. In this economy, interest rate parity holds instantaneously, and PPP holds in the long run (equivalent to one year). The demand for real money balances is given by $m^D = \frac{Y}{10i}$, output is constant at the full employment level, $Y^f = 100$, and the foreign price level is constant and equal to 1.

a) Initially, assume that $M = 100$ and that $i = i^* = 10\%$. Determine:
(a1) The real money demand.
(a2) The price level.
(a3) The nominal exchange rate.
(a4) The expectations regarding the long-run level of the exchange rate.
(a5) Represent graphically in the money market and the foreign exchange market.

b) Suddenly, the economy was thunderstruck with a **permanent liquidity shock** and preferences regarding real money demand balances shifted to $\boldsymbol{m^D = \frac{Y}{5i}}$.
(b1) Describe the impact on the **long-run** values of:
- (b1.1) the domestic interest rate.
- (b1.2) the real money demand.
- (b1.3) the price level.
- (b1.4) the nominal exchange rate.

(b2) Describe the impact on the **short-run** values of:
- (b2.1) the price level.
- (b2.2) the real money demand.
- (b2.3) the domestic interest rate.
- (b2.4) the nominal exchange rate.

(b3) Represent graphically in the money market and the foreign exchange market.
(b4) Represent the time paths for the domestic interest rate, price level and nominal exchange rate.

c) Now, assume that to address this liquidity shock, the central bank immediately deploys the policy package "Back in Black" which consists of **keeping the exchange rate stable at the value found in (a3)**. Find:
(c1) The implied money supply.
(c2) Represent graphically in the money market and the foreign exchange market, explaining the adjustment.

II. A $\quad M^D = \frac{Y}{10i} \quad Y_f = 100 \quad P^* = 1$

a) $M^S = 100 \quad i = i^* = 10\%$

a.1) $M^D = \frac{100}{10 \times 0.1} = 100$

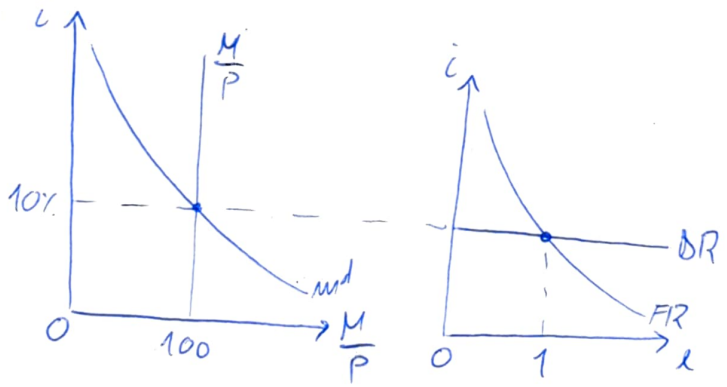
a.2) $M^D = \frac{M^S}{P} \Leftrightarrow P = \frac{M^S}{M^d} = \frac{100}{100} = 1$

a.3) Since $Y = Y_f$, $i = i^*$ the economy is at the steady state, so we can apply PPP

$$e = \frac{P}{P^*} = \frac{1}{1} = 1$$

a.4) Given we are at the steady state, $e = e_{LR} = E(e) = 1$

a.5)



b) $M^D = \frac{Y}{5i}$ (permanent shock)

b.1) b.1.1) In the long-run, $e = E(e)$, thus, by the UIRP, $i = i^* = 10\%$

b.1.2) $M^D = \frac{100}{5 \times 0.1} = 200$

b.1.3) $P_{LR} = \frac{M^S}{M^d} = \frac{100}{200} = 0.5$

b.1.4) $e = \frac{P}{P^*} = \frac{0.5}{1} = 0.5 = e_{LR} = E(e)$

b.2) b.2.1) In the short-run, prices are sticky, thus $P = 1$

b.2.2) $m^d = \frac{M^S}{P} = \frac{100}{1} = 100$

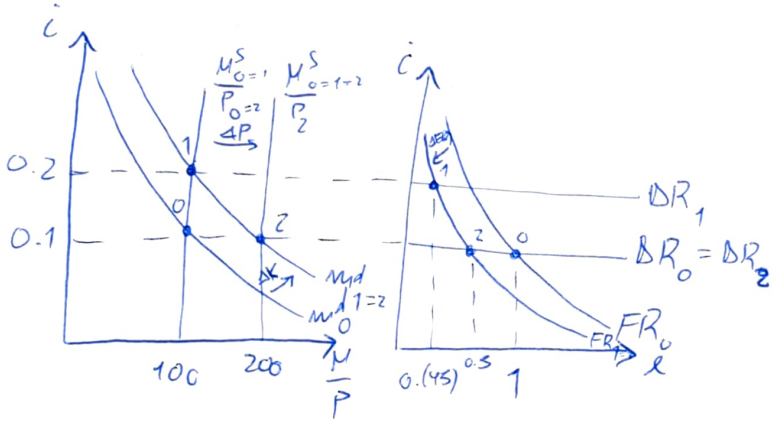
b.2.3) $m^d = 100 \Leftrightarrow \frac{Y}{5i} = 100 \Leftrightarrow 5i = \frac{Y}{100} \Leftrightarrow 5i = \frac{100}{100} \Leftrightarrow 5i = 1 \Leftrightarrow$

$\Leftrightarrow i = \frac{1}{5} = 0.2 = 20\%$

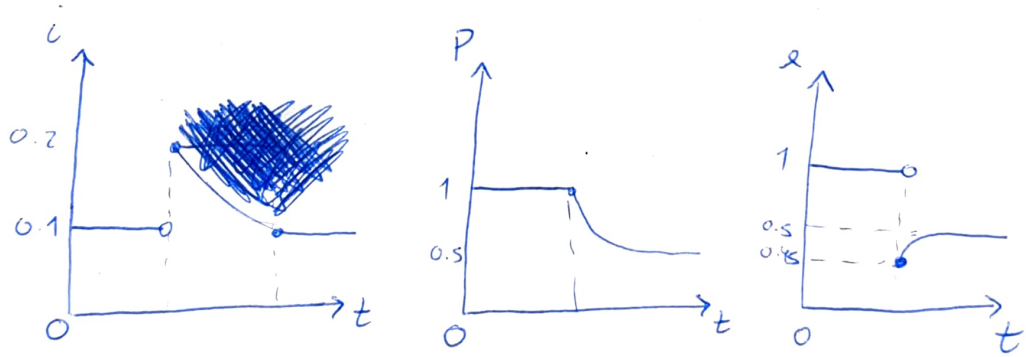
b.2.4) By the UIRP, $i = i^* + \frac{E(e)}{e} - 1 \Leftrightarrow 0.2 = 0.1 + \frac{0.5}{e} - 1 \Leftrightarrow$

$\Leftrightarrow \frac{0.5}{e} - 0.9 = 0.2 \Leftrightarrow \frac{0.5}{e} = 1.1 \Leftrightarrow e = \frac{0.5}{1.1} \Leftrightarrow e = 0.(45) \approx 0.45$

b.3)



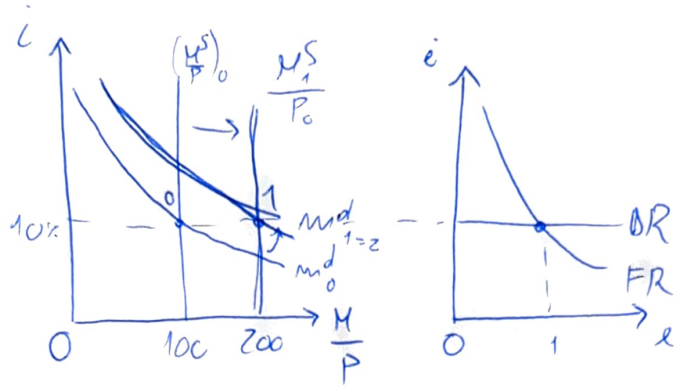
b.4)



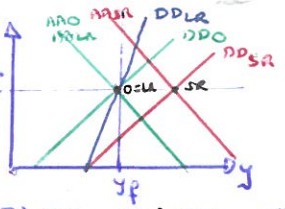
c) c.1) If the exchange rate is kept stable, then we will still have $i = i^* = 10\%$ and $e = 1$.

Thus, $m^D = \frac{100}{5 \times 0.1} = 200$ and $M = P \times m^d = 1 \times 200 = 200$

c.2)



Facing an increase in money demand, given the liquidity shock, the central Bank increases the money supply, buying reserves, to match the demand increase and keep the foreign exchange market stable.



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II.B. Consider the open economy of Dunphy which has **sticky** prices and a money demand of $m^D = \frac{Y}{10i}$. The central bank of Dunphy follows a **fixed exchange rate regime**, with $e = E(e) = 5$ and $B_{CB} = 50$. The interest rate parity holds instantaneously, the foreign interest rate is equal to $i^* = 10\%$, $P^* = 1$ and $P = 2$. Consider, as well, that the goods market equilibrium is described by $Y = 2\,(\bar{A} + TB)$, $\bar{A} = 60$ and $TB = 10\left(\frac{eP^*}{P} - 3{,}5\right)$. Finally, the full employment level of output is given by $Y^f = 100$.

d) Assuming that the peg is credible:
(d1) Derive the DD Curve.
(d2) Is there internal balance and/or external balance? Justify.
(d3) Find the endogenous money supply and derive the AA curve.

e) Suppose now that Dunphy's main firm – Pritchett's Closets & Blinds – starts exporting its groundbreaking invention, *the Head-Scratcher T.M.* That boosts Dunphy's trade balance permanently, such that $TB = 10(\frac{eP^*}{P} - 2)$. Assuming that the central bank keeps the peg:
(e1) Derive the short-run DD curve.
(e2) Find the short-run levels for output and for the endogenous money supply.
(e3) Draw the central bank balance sheet, comparing with the case in d).
(e4) Derive the short-run AA curve.
(e5) Characterize this equilibrium in terms of internal and external balance.
(e6) **Without presenting values and with no further computations**, represent in the AA-DD diagram three points: (0) representing the initial equilibrium from d), (SR) representing the short-run equilibrium after the shock, and (LR) representing the long-run outcome. Explain, for each of the equilibriums, why the AA and/or DD curves are changing.

f) Suppose now, **departing from e**, that the prime-minister of Dunphy, Claire Pritchett, does not want to let the economy converge to the long-run equilibrium. Instead, she decides, immediately after the shock, to execute a permanent fiscal policy, by changing $\bar{A}$, to ensure that output goes immediately to its full employment level.
(f1) Find the new value for $\bar{A}$ and derive the DD curve.
(f2) Find the endogenous money supply and derive the AA curve.
(f3) Compare the AA and DD curves obtained in (f1) and (f2) with those obtained in d), explaining the result.
(f4) Suppose that Claire wanted to achieve external balance with this policy as well. Was she successful?

g) Suppose instead, **departing from e**, that the governor of the Central Bank of Dunphy, Jay Pritchett, decides to abandon the peg **when** $TB = 10(\frac{eP^*}{P} - 2)$, holding M constant at the value found in (d3). Therefore, **considering that Dunphy has a flexible exchange rate regime**:
(g1) Explain why the DD curve is equal to the one found in (e1).
(g2) Find the values for the nominal exchange rate and for the output.
(g3) Derive the AA curve.
(g4) Consider that Dunphy is particularly vulnerable to foreign demand shocks, such as the one in e), which can either increase or decrease the TB. If Jay wants to ensure that there is a low job volatility (that is, that the number of jobs is relatively stable), should he follow a fixed or a flexible exchange rate regime? Justify.