

International macroeconomics (2021–2022)

Final exam

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18 January 2022, 16.00

Surname: _____

First name: _____

ID or passport number: _____

Group: _____

Question	Points	Obtained
1	8	
2	8	
3	8	
4	8	
5	8	
Total	40	

Instructions

The exam consists of **five questions**.

In total, it is possible to obtain up to **40 points**.

Duration of exam: **1 hour and 30 minutes** (= 2.25 minutes per point or 18 minutes per question).

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1. (a) Consider the "intertemporal approach to the current account" we have studied in the lectures. In this model, a representative agent maximizes utility over two periods: [2]

$$\max_{C_1} u(C_1) + u(C_2), \quad (1)$$

subject to the following budget constraints:

$$C_1 + z_1^{\text{HF}} = z_0^{\text{HF}} + Y_1, \quad (2)$$

$$C_2 + z_2^{\text{HF}} = z_1^{\text{HF}} + Y_2. \quad (3)$$

The two-period intertemporal budget constraint is thus:

$$z_0^{\text{HF}} + Y_1 + Y_2 = C_1 + C_2 + z_2^{\text{HF}}. \quad (4)$$

Solve the model using the Lagrange method, so as to obtain the optimal values of C_1 , C_2 , CA_1 and CA_2 . (Note: Do not set z_0^{HF} and z_2^{HF} to zero in your calculations.)

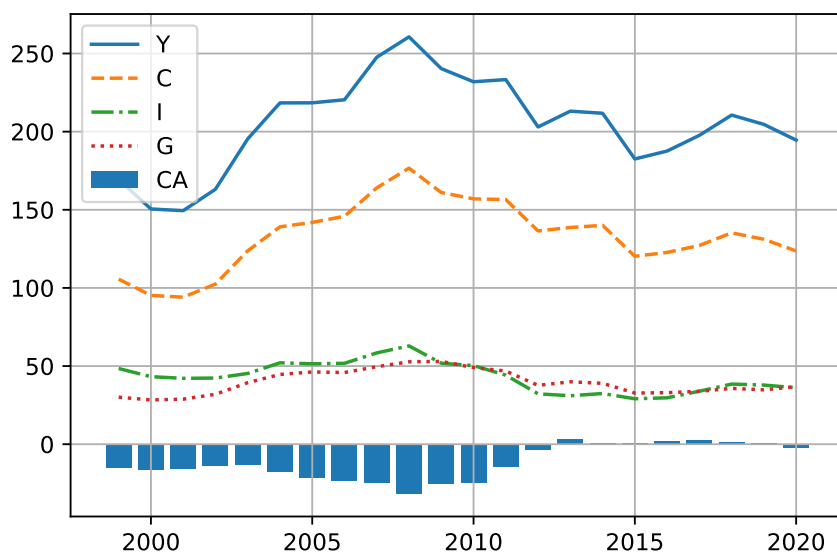


Figure 1: Production, consumption, investment, government spending and the current account of Portugal. Production (GDP), which is similar to gross national disposable income (GNDI), is shown as a solid line, consumption as a dashed line, investment as a dash-dotted line and government spending as a dotted line. The current account is shown as a bar plot. All variables are measured in billions of 2010 US dollars and shown at an annual frequency. Sources: International Financial Statistics (IMF).

(b) Now consider figure 1. What do you think caused Portugal’s very substantial current account deficit during the 2000s? [5]

Hints:

- Look for an appropriate economic equation that helps you to develop your argument.
- Try, if possible, to link your explanation to major economic events that occurred in Portugal during the years shown in figure 1.

- (c) Do you think that the Portuguese experience during the 2000s confirms the theoretical predictions of the intertemporal approach to the current account? Explain your answer briefly. [1]

Total of question 1: [8]

2. (a) What is the difference between the monetary base (= base money or high-powered money) and the broad money supply (for example, M2)? [2]

(b) What are open-market operations and which is their purpose? [2]

(c) What is official intervention and which is its purpose? [2]

(d) What are bank reserves and why are banks obliged to hold them? (Careful: Don't confuse bank reserves with official reserves.) [2]

Total of question 2: [8]

3. Consider the following equations:

$$\Delta s_t = -(\Delta p^H - \Delta p^F) + \xi \Delta m_t^{HF}, \quad (5)$$

$$CA_t = \Delta e_t^{HF} + \Delta b_t^{HF} + \Delta m_t^{HF} + \Delta b_t^{\bar{HF}}. \quad (6)$$

- (a) What do equations 5 and 6 represent, respectively? [2]
- (b) Why do we refer to Δm_t^{HF} as "net money inflows" and not just "money inflows" (without the word "net")? [1]
- (c) Suppose a country refrains from intervening in the foreign exchange markets (refrain from intervening = does not intervene). Under this assumption, write down the rate of nominal appreciation, Δs_t , as a function of Δp^H , Δp^F , CA_t , Δe_t^{HF} and $\Delta b_t^{\bar{HF}}$. Also write down in words what the main drivers of the nominal exchange rate are. [2]
- (d) Suppose now that the country wants to fix the real exchange rate ($\Delta q_t = 0$). Calculate the amount of official reserves the central bank would have to buy or sell in each period; that is, which value would $\Delta b_t^{\bar{HF}}$ take? Also state in words the main factors that drive the official reserve purchases and sales in this case. [2]
- (e) In the light of your answers to the previous questions, which major developments of the world economy since the Second World War may have made it more difficult for countries to maintain fixed exchange rate regimes? A brief enumeration of the developments is enough; you do not need to justify or elaborate your answer. [1]

Total of question 3: [8]

4. Consider the monetary model of exchange rate determination with flexible prices in its logarithmic structural form:

$$s = -(p^H - p^F), \quad (7)$$

$$m^H - p^H = ay^H - bR^H, \quad (8)$$

$$m^F - p^F = ay^F - bR^F. \quad (9)$$

- (a) Derive the reduced form for all three endogenous variables of the model. [3]

- (b) According to the reduced form of the model, what is the effect of a one-percent increase in domestic income, Y^H , on the nominal exchange rate, S_t . [1]

- (c) Use the structural form in equations 7 to 9 to explain step by step how the increase in domestic income brings about the change in the nominal exchange rate. [3]

Let's turn again to the structural form of the model, but this time in exponentiated form:

$$S = \frac{\frac{1}{P^H}}{\frac{1}{P^F}}, \quad (10)$$

$$\frac{1}{P^H} = \frac{(Y^H)^a e^{-bR^H}}{M^H} = \frac{\text{(real) domestic money demand}}{\text{(nominal) domestic money supply}}, \quad (11)$$

$$\frac{1}{P^F} = \frac{(Y^F)^a e^{-bR^F}}{M^F} = \frac{\text{(real) foreign money demand}}{\text{(nominal) foreign money supply}}. \quad (12)$$

- (d) What do the fractions $\frac{1}{P^H}$ and $\frac{1}{P^F}$ in equations 10 to 12 represent in economic terms? [1]

Total of question 4: [8]

5. (a) You are given the following data:

[6]

$$\text{Budget deficit} = 2 \quad (13)$$

$$\text{Exports of goods and services} = 25 \quad (14)$$

$$\text{Government tax revenue} = 13 \quad (15)$$

$$\text{Gross domestic product} = 100 \quad (16)$$

$$\text{Imports of goods and services} = 30 \quad (17)$$

$$\text{Net factor income from abroad} = 3 \quad (18)$$

$$\text{Net unilateral transfers} = -1 \quad (19)$$

$$\text{Private consumption} = 70 \quad (20)$$

Using these data, calculate domestic savings, $s_t^H = \Delta w_t^H$.

(b) In the United States, total wealth, w_t , the real capital stock, K_t , and the net international investment position, z_t^{HF} , took the following three values in 2021, albeit in a possibly different order: \$140.6 trillion, \$126.3 trillion, \$-14.3 trillion. Can you determine which value belongs to which variable? Please justify your choice very briefly.

[2]

Total of question 5: [8]

