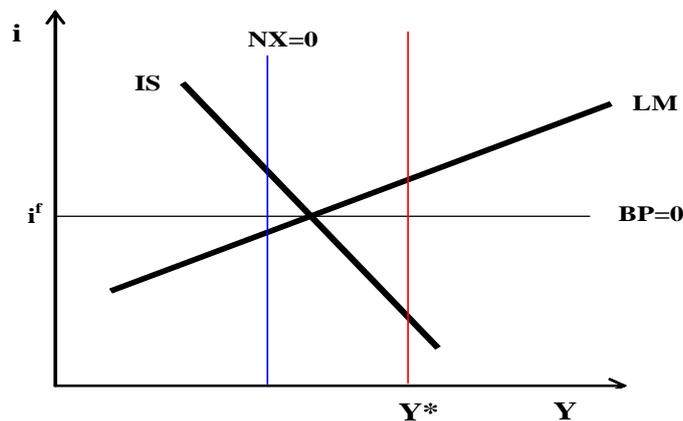


## JEM111 International Macroeconomics State examination questions

### 1. Mundell-Fleming model, current account determination in the neo-classical synthesis

- i) Current account deficit: (a) ... is a result of exports falling short of imports; (b) ... is a result of savings falling short of investments. Which of these two statements is correct (if any)? Explain this using the basic macroeconomic identities.
- ii) What can lead to a current account deficit in the models of neo-classical synthesis? What should the authorities do with current account deficits according to these models? What is the conventionally accepted “safe” level of a current account deficit? How does this approach to current account deficits differ from the models with optimizing economic agents and no nominal rigidities (e.g. the 2-period model of intertemporal trade)?
- iii) Assume perfect capital mobility and a fixed exchange rate. How to simultaneously achieve internal (i.e. GDP equal to  $Y^*$ ) and external (net exports  $NX=0$ ) equilibrium of an economy, the starting conditions of which are depicted in the picture below?



- iv) Discuss the main shortcomings of the Mundell-Fleming model.

### 2. Intertemporal trade in a 2-period model

Assume a small endowment economy that exists for two periods only. Each person in this economy receives an income  $Y_1=100$  in the first period and  $Y_2=300$  in the second period. The goods are non-storable. The people try to maximise their lifetime utility given by  $U=\ln(C_1)+\beta\ln(C_2)$ , where  $\beta$  is the subjective discount rate equal to 0.97, and  $C_1$ ,  $C_2$  is consumption in the first and second period, respectively. Please, answer the following questions:

- i) What would be the consumption of each person in the two periods if the economy was completely closed? What lifetime utility would the people achieve? What would be the real interest rate in such an economy and why?
- ii) Now assume that the economy is allowed to borrow and lend in the international financial markets without limit at the interest rate  $r^*$ , such that  $(1+r^*)=(1/0.97)$ . What would be the optimal distribution of consumption between the two periods for each

person (exact numbers are not necessary)? How would the utility of the people change compared to the closed economy case?

- iii) What would be the country's trade balance and current account balance in each period?
- iv) Now assume instead that  $Y_1=200=Y_2$ . There is a government that collects lump-sum taxes and finances its consumption  $G_1, G_2$ . Give an example of a time profile of this government consumption, which would lead to a current account surplus in the first period and a deficit in the second period.

### 3. Intertemporal trade in an infinite horizon model (Permanent Income Hypothesis)

Consider an open economy with infinitely lived economic agents maximising their "lifetime" utility given by  $U=\sum\beta^t\ln(C_t)$ ,  $t=0\dots\infty$ . Each period the economic agent receives an endowment income  $Y_t=200$ . The world interest rate  $r^*$ , at which people can borrow or lend without limit, is 3%. Please, answer the following questions:

- i) How would the consumption of individuals, the aggregate consumption, trade balance and current account behave with: (a)  $\beta=0.90$ ; (b)  $\beta=1/1.03$ ; (c)  $\beta=0.99$  (exact numbers not required)? Which of these cases leads to realistic outcomes of the model?
- ii) Now assume that the initial income  $Y_1$  falls unexpectedly to 100, but returns to the original level  $Y_t=200$  from the next period onwards. What would this imply for the consumption of individuals, the aggregate consumption, trade balance and current account in the current and future periods with  $\beta=1/1.03$ ? Explain this by comparing the current income to its permanent level.
- iii) Assume instead, that in the initial period the government has to carry out some consumption equal to  $G_1=50$  (per capita), e.g. to finance one-off military spending. The individuals derive no utility from this government consumption, but they have to pay for it by paying lump sum taxes in the same period  $T_1=50$  (per capita). What would this imply for the consumption of individuals, the aggregate consumption, trade balance and current account in the current and future periods?
- iv) Discuss the limitations of this model and their possible solutions.

### 4. Overlapping generation model (OLG)

Consider an open OLG economy with agents living for two periods (whilst the economy exists forever). The population is constant, with young and old generations having both a 50% share in total number of people. The individuals are maximising their lifetime utility  $U=\ln(C_{Y,t})+\beta\ln(C_{O,t+1})$ , where  $C_{Y,t}$  is consumption of a young person in period  $t$  and  $C_{O,t+1}$  is consumption of an old person in time  $t+1$ . When young, a person receives an endowment income  $Y_{Y,t}=400$ , but he/she gets nothing when old. The world interest rate  $r^*$  is 3%. Please, answer the following questions:

- i) How would the consumption of individuals be distributed between the young age and old age with: (a)  $\beta=0.90$ ; (b)  $\beta=1/1.03$ ; (c)  $\beta=0.99$ ?
- ii) What would be the trade balance and current account balance in the above case (a)? Compare it with the results of a model with infinitely-lived economic agents.
- iii) Take the previous example with  $(1+r^*)\beta=1$ . Assume that the government gives a transfer equal to 10 to the old people in period  $t$ . Government bonds are issued to finance this transfer. The bonds are repaid in period  $t+1$  by imposing lump-sum taxes in an equal amount both on the young and old people in that period. How would this policy influence

consumption of each generation and the current account of the economy in periods  $t$ ,  $t+1$  and  $t+2$ ?

iv) Does the “Ricardian equivalence” hold in the OLG model? Explain.

### 5. “Twin deficits” and the Ricardian equivalence

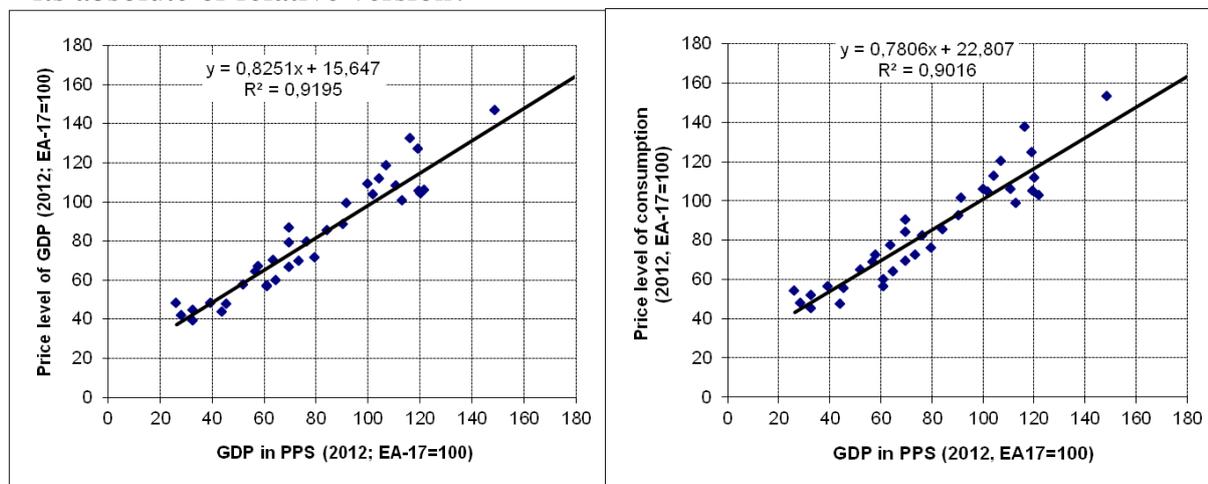
- i) What is meant by the term “twin deficits”? Do you know some countries and some period of time in which this phenomenon was observed?
- ii) Assume that the government in the starting period introduces temporary government consumption fully financed by lump-sum taxes equally distributed on all economic agents, i.e.  $G_1 = T_1$ . What would this imply for the private consumption, trade balance and the current account balance in: (a) the 2-period model; (b) model with infinitely-lived agents; (iii) OLG model with agents living for two periods? Explain the similarities and differences among these models. Is there a “twin deficit” in any of these cases?
- iii) Assume that the government in the starting period  $t=1$  gives a lump-sum transfer  $TR_1$  to each economic agent. Government bonds are issued to finance this transfer. The government bonds bear the world real interest rate  $r^*=3\%$ . The bonds will be fully repaid in periods  $t=3$  by imposing a lump-sum tax equally on each economic agent. Discuss what would this imply for the private consumption, trade balance and the current account balance in: (a) the 2-period model; (b) model with infinitely-lived agents; (c) OLG model with agents living for two periods? In which case does a “twin deficit” emerge, and in which it does not?
- iv) Does the “Ricardian equivalence” hold in: (a) the 2-period model; (b) model with infinitely-lived agents; (iii) OLG model? Explain.

### 6. Long-term convergence in open economies with infinitely lived agents

- i) Consider a small open economy with infinitely lived agents (families;  $n$  is the number of people in each family) maximising their “lifetime” utility given by  $U = \sum_{t=0}^{\infty} \beta^t (1+n)^t \ln(C_t)$ ,  $t=0 \dots \infty$ ,  $\beta=1/\rho$ . First assume that the per capita income (as well as population) is constant over time and falls down from heaven. The world interest rate  $r^*$ , at which people can borrow or lend without limit, is 3%. Assume that people in this economy are relatively impatient with  $\rho > 3\%$ . What would be the per-capita consumption profile of people in this economy? How would the international debt of this economy develop?
- ii) Now assume that there are many such small open economies  $i$  in the world. The economies are alike, except of the fact that they differ in the degree of their patience  $\rho_i$ . How would the world real interest rate be determined in the long-run equilibrium? What would be the consumption and foreign debt profile of each economy in this model? Is this a realistic outcome?
- iii) Consider an open-economy version of the Ramsey model with a production function  $Y_t = A_t (K_t)^\alpha (L_t)^{1-\alpha}$ , in which the country can borrow the physical capital with no limit at the world interest rate  $r^*=3\%$ . How quickly would this economy converge to its steady state, and why? Compare this with a closed-economy case. Is this in line with the empirical observations?
- iv) Now consider an open-economy version of the Ramsey model with a production function  $Y_t = A_t (K_t)^\alpha (H_t)^\eta (L_t)^{1-\alpha-\eta}$ , where  $H$  denotes human capital. Assume that the country can borrow physical capital at the world interest rate  $r^*=3\%$ , but cannot borrow human capital. Describe the convergence process in such an economy.

## 7. Price convergence and the Balassa-Samuelson effect

- i) Comment the following chart. Is it consistent with the purchasing power parity theory in its absolute or relative version?



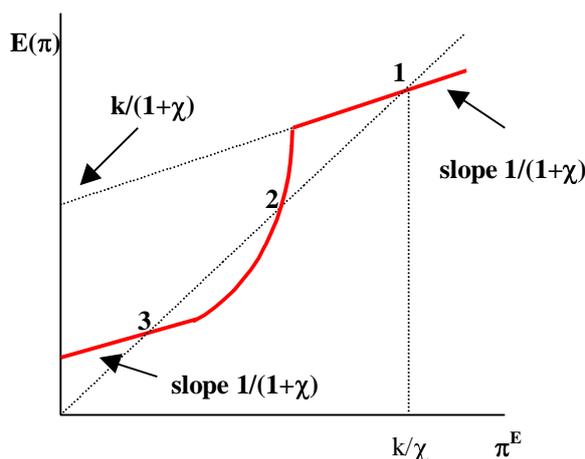
- ii) What are the basic assumptions of the Balassa-Samuelson model? Discuss if they are realistic or not.
- iii) Assume that the technology is  $Y_T = A_T L_T$  in the production of tradable goods and  $Y_N = A_N L_N$  in the production of non-tradables, where Y denotes output, A labour productivity and L labour. The same type of technology is used abroad, but labour productivity may be different. What happens with the relative domestic price level (i.e. in comparison with foreign price level) if the technological parameter  $A_T$  goes up? Explain.
- iv) What does the Balassa-Samuelson theory, as well as the above empirical chart, imply for the real exchange rate developments in converging economies?

## 8. First generation models of the currency crises

- i) What are the basic characteristics of the first generation models of the currency crisis? When were these models built and to which crises they were responding?
- ii) Explain verbally the Krugman first-generation model of currency crises. What causes the crises?
- iii) When does a crisis take place? Which variables affect the timing of the crisis?
- iv) What are the policy implications of the first generation models?

## 9. Second generation models of the currency crises

- i) What is the difference of the second generation of the currency crises models compared to the first-generation models? Which actual currency crisis motivated the creation of the second generation models?
- ii) Comment the picture below, summarising the result of the Obstfeld model. What are the main assumptions of this model?



- iii) What is the character of the currency crises in this model? Is it easy to predict the emergence and timing of the crises according to this model?
- iv) What are the policy implications of the second generation models? Explain the bipolar view of the exchange rate regimes and its relation to the second generation models of the currency crises.

#### 10. Third generation models of the currency crises

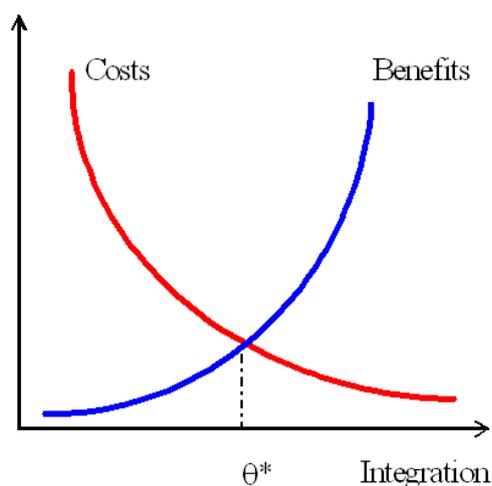
- i) To which crisis were the third generation models of the currency crises responding? What were the main characteristics of this crisis?
- ii) What are the key characteristics of the third generation models? What are their common features and differences in comparison with the first and second generation models?
- iii) Give an example of a model belonging to the third generation and briefly explain its main ideas.
- iv) What are the policy implications of the third generation models?

#### 11. Costs and benefits of international financial liberalisation, financial market imperfections

- i) What are the main benefits of international financial liberalisation? Give examples of some models that highlight these benefits.
- ii) Name some challenges of the international financial liberalisation. Which currency and/or financial crises do you know? What are the real costs of crises according to the different models and empirical evidence?
- iii) Discuss potential sources of imperfections in the international financial markets and their consequences.
- iv) What is the role of international organisations (e.g. of the IMF, WB etc.) in the international financial markets?

#### 12. Optimum currency area theory (OCA)

- i) What role is played by nominal and real shocks in the debate: “float versus fix”?
- ii) Explain the picture below illustrating the optimum currency area theory. What are the costs and benefits of joining a currency area? Discuss the link between these costs and benefits on the one hand and degree of economic integration with the monetary union on the other hand.



- iii) How can an economy adjust to asymmetric macroeconomic shocks in a monetary union?
- iv) How are the criteria for an optimum currency area measured empirically? What are the results (e.g. for the Czech Republic or for the current members of the euro area)?

### 13. Inflation targeting in small open economies

- i) Explain the main characteristics of the inflation targeting regime. How does it differ from other monetary policy regimes (e.g. exchange rate pegs, money targeting etc.)? How many central banks (approximately) around the world are using the inflation targeting regime?
- ii) What is the empirical performance of inflation targeting in comparison to other monetary policy regimes?
- iii) What is the role of exchange rate in the monetary policy transmission in small open economies? Which channels of exchange rate transmission do you know? How do they differ in terms of their speed?
- (iv) What does the traditional inflation targeting literature assume about the exchange rate determination? How should – according to this theory – the exchange rate respond to an unexpected increase in the domestic interest rates?

### 14. Foreign exchange interventions under the inflation targeting

- i) What does the traditional literature tell us about foreign exchange interventions and inflation targeting? What is the actual practice? Do you know any countries that target inflation and use foreign exchange interventions at the same time?
- ii) How can, according to its proponents, managed floating improve the results of an inflation targeting framework? Illustrate graphically. Are there any challenges for combining managed floating and inflation targeting?
- iii) What transmission channels of foreign exchange interventions do you know? How effective are foreign exchange interventions in practice according to the empirical literature (in the Czech Republic or globally)?
- iv) Do you know any country that has used the exchange rate / FX interventions as an unconventional monetary policy instrument during the recent crisis / at the zero lower bound of the nominal interest rates? What is the experience so far?