Stockholms
universitet

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| Course name: | INTERMEDIATE MACROECONOMICS |
| Course code: | EC2201 |
| Type of exam: | Retake. |
| Examiner: | Anna Seim. |
| Number of credits: | 7.5. |
| Date of exam: | Saturday May 4 2019. |
| Examination time: | 5 hours (9:00-14:00). |
| Aids: | No aids are allowed. |

Write your identification number on each answer sheet (the number stated in the upper right-hand corner on your exam cover).

Start each new question on a new answer sheet.

Explain notions/concepts and symbols. If you think that a question is vaguely formulated, specify the conditions used for solving it. Only legible exams will be marked.

The exam consists of 5 questions, worth 100 points in total. The maximum number of points on each sub-question are stated within parenthesis. For the grade E 45 points are required, for D 50 points, C 60 points, B 75 points and A 90 points.

Question 4 may be answered in English or Swedish. All other questions should be answered in English.

Your results will be made available on your Ladok account (www.student.ladok.se)
within 15 working days from the date of the examination.

**Good luck!**

**Question 1: Short questions (25 points in total)**

Please write no more than one page when answering each of these questions.

a. Consider the bathtub model of unemployment. Let $L$ denote the constant labour force, let $E$ denote employment and let $U$ denote unemployment. Assume that the job-finding rate is 1/5 and that the job-separation rate is 1/20. Compute the unemployment rate, i.e. $u \equiv U/L$.

b. Consider a household living for two periods. The intertemporal budget constraint is given by

$$c_1 + \frac{c_2}{1+r} = y_1 + \frac{y_2}{1+r},$$

where $c$ is consumption, $y$ is income and $r$ is the interest rate. The household's preferences are characterised by the utility function

$$U(c_1, c_2) = \ln c_1 + 0.95 \ln c_2,$$

where 0.95 is the discount factor. Derive the Euler equation and interpret the expression. (5 points)

c. Use the national income identity to derive an expression showing how aggregate saving and investment are related in a small open economy. (5 points)

d. Explain what the Balassa-Samuelson effect implies for differences in price levels and inflation across rich and poor countries. Describe the mechanism at work.

e. Consider an economy where technology is captured by the following production function:

$$Y(K, L) = K^{1/4} L^{3/4}.$$

Show that the production function exhibits constant returns to scale and compute the marginal product of capital.

**Question 2: The AS-AD model (25 points)**

Consider the AS-AD model discussed in the course. Assume initially that the real interest rate only affects investment.

a. Write down the expressions for the AS and AD curves and interpret the expressions: what is the intuition behind the two curves? What must be true of the model parameters and variables in the long-run equilibrium, i.e. in the steady state? (8 points)

b. Consider an economy that starts out in steady state when the central bank decides to make the inflation target more ambitious. Analyse the effects of a decrease in the inflation target from $\bar{\pi}$ to $\bar{\pi}'$. Explain the mechanisms behind the adjustment to the new steady state. (8 points)

c. As in the book by Jones, assume that the real interest rate also affects net exports according to the following expression:

$$\frac{NX_t}{\bar{Y}_t} = \alpha_{NX} - \beta_{NX}(r_t - r_t^*).$$

Carefully explain the intuition behind this equation. (6 points)

d. How is the slope of the AS and AD curves affected when the interest rate has the additional effect on net exports described in c? No derivations are needed, but please motivate your answer. (3 points)

**Question 3: Fiscal policy and long-run sustainability (20 points)**

a. Explain the concept of an automatic stabilizer in the context of fiscal policy. (2 points)

b. Explain what is meant by deficit bias and state at least three reasons for why it may arise. (4 points)

c. Derive an expression for how the primary budget balance as a share of GDP and the existing debt-to-GDP ratio affect the change in the current debt-to-GDP ratio. (6 points)

d. Use the equation derived in question c to discuss what is required to stabilize the debt ratio. Explain the trade-off that governments face when contemplating debt stabilization. (4 points)

e. State two features of the Swedish Fiscal framework and explain what they entail. (4 points)

## Question 4: Economic growth (20 points)

*This is an essay question where you are supposed to refer to material covered in the course. Please be brief and to the point. You may answer in English or in Swedish. Write no more than 3 pages (maximum). Only legible answers will be considered.*

Refer to different models covered in the course to discuss how long-run economic growth is determined. What is the role of technology?

## Question 5: The time inconsistency problem of monetary policy (10 points)

*This is a credit question that should only be answered by students who have not received course credit from the seminar exercises. Students who have obtained course credit automatically receive 10 points on this question and cannot obtain extra points by answering it.*

Consider an economy that is characterised by the following Phillips curve:

$$u = \overline{u} - \theta(\pi - \pi^e),$$

where $u$ is unemployment, $\overline{u}$ is the natural rate of unemployment, $\pi$ is inflation, $\pi^e$ is inflation expectations and $\theta > 0$ is a parameter. Suppose that the loss function of the central bank is given by:

$$L(u, \pi) = u + \frac{\gamma}{2}\pi^2.$$

where $\gamma$ is a parameter. Agents are assumed to be rational.

a. Compute inflation and unemployment if the central bank commits to $\pi = 0$ and is believed by the public. (4 points)
b. Compute inflation and unemployment if the central bank acts under discretion. (4 points)
c. Suggest two ways of dealing with this time-inconsistency problem of monetary policy. (2 points)