School of Economics and Finance

May/June Examination Period 2024-25

ECN 229 Macroeconomics III

Duration: 2 hours

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Please answer ALL questions

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Examiners: Giulio Fella

Question 1

Discuss whether each of the statements below is TRUE or FALSE and provide a brief (no more than half a page) explanation.

(a) Government solvency is a necessary condition for Ricardian Equivalence to hold.

[10 marks]

(b) "Sustained high inflation is always and everywhere a fiscal phenomenon."

[10 marks]

(c) The neoclassical approach to labour market equilibrium cannot account for the coexistence of unemployed workers and unfilled job vacancies.

[10 marks]

(d) According to the Jorgensonian theory current investment is a function of the present and future user cost of capital.

[10 marks]

Question 2

Consider an economy in which the demand for real money balances at time t is given by

$$L_t^d = \frac{Y_t}{3}\left[1 - (R + \pi_t^e)\right]$$

withh Y_t and π_t^e denoting, respectively, real GDP and the expected rate of inflation at time t and R the real interest rate. The real interest rate is constant and equal to 2%, while Y_t grows at a constant 2% rate.

(a) Write down the money market equilibrium condition and an expression for seignorage as a proportion of GDP.

[10 marks]

(b) Derive the constant rate of money growth that maximises the share of seignorage in GDP and find the corresponding maximum seignorage/GDP ratio.

[10 marks]

(c) Government solvency requires the long-run seignorage/GDP ratio to equal to 7%. Derive the constant rate of money growth consistent with the required seignorage/GDP ratio and the associated rate of inflation.

[10]marks]

Question 3

Consider an economy in which individuals live for two periods and, when young, they allocate consumption over time to maximise the utility function

$$u(c_1) + \beta u(c_2)$$

where c_i denotes consumption in period $i = 1, 2$, $u(\cdot)$ is strictly increasing, strictly concave and differentiable. The discount factor β satisfies $\beta(1 + r) = 1$ where $r = 0.05$ is the exogenous interest rate at which individuals can freely borrow and lend. Individuals are endowed with income $Y_1 = 100$ when young and $Y_2 = 0$ when old. Initially, the economy does not feature any taxes or pension.
The government is planning the introduction of a compulsory pension system and is contemplating two alternative schemes: (1) a pay-as-you-go and (2) a fully-funded scheme. In both cases agents would have to pay the same tax $\tau = 20$ out of their labour income when young. Under the pay-as-you-go scheme, retirees would receive a pension equal to $(1 + \gamma)\tau$, where $\gamma = 0.02$. Under the fully-funded scheme, the tax τ would be invested at the market interest rate r and the pension in old age would equal $(1 + r)\tau$.

(a) Write down the Euler equation of a young consumer and derive the relationship between consumption when young and lifetime wealth.

[10 marks]

(b) Is lifetime wealth higher (i) in the absence of a pension system, (ii) under a pay-as-you-go system or (iii) under a fully-funded one? Show all your working.

[5 marks]

(c) Derive the change in consumption when young that is associated with the introduction of each type of pension system.

[10 marks]

(d) What is the effect of the introduction of each type of pension system on consumption when young if individuals are borrowing constrained.

[5 marks]

End of Paper