

May Examination Period 2023-24

ECN229 Macroeconomics III

Duration: 2 hours

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Answer ALL questions

Calculators are not permitted in this examination. Complete all rough workings in the answer book and cross through any work that is not to be assessed.

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Examiner: Gabriel Bracons

Question 1.**[40 marks]**

Answer the questions below. Some questions require a true or false answer while some require a SHORT explanation. These questions are meant to test your intuition so no math is required. Try to be as concise as possible.

1. True or False? According to the definition of business cycles, every year around Christmas, an economy experiences an economic boom. **[5 marks]**
2. True or False? Investment is extremely volatile and countercyclical. **[5 marks]**
3. Assume an economy where agents buy goods produced by firms, who are monopolistically competitive. Firms produce using labour and are subject to productivity shocks. Assume the central bank decides to print money and give it to the consumers. Will this policy boost production if firms can adjust prices freely? **[5 marks]**
4. True or False? Assume a two-period economy where agents have perfect information and they are subject to idiosyncratic income shocks in the second period. Considering storage is not possible, savings in this economy will be lower than without uncertainty. **[5 marks]**
5. True or False? Empirical evidence suggests that when firms face a negative economic shock, they cut the number of workers while wages remain mostly constant. **[5 marks]**
6. True or False? After the Great Recession, workers' geographic mobility in the US decreased. This translated into worse matching in the labour market. Hence, the US economy moved to the right along the Beveridge curve, showing unemployment is higher and vacancies are lower. **[5 marks]**
7. Assume an economy where firms face monopolistic competition and prices are sticky. If the central bank introduces newly printed money in the economy, it will boost GDP in the short run. However, what will be the effect in the long run after firms adjust prices? **[5 marks]**
8. True or False? Assume the interest rate on bonds depends on the level of outstanding debt. If the interest rate on government bonds is currently lower than economic growth, the government can issue as much debt as desired while maintaining debt-to-GDP levels. **[5 marks]**

Question 2.**[30 marks]**

1. Suppose consumers have a two-year planning horizon and maximize utility given by

$$u(C_t, G_t) = G_t \ln(C_t) \quad (1)$$

where $G_t > 0$ denotes real government expenditure and C_t denotes consumption. Agents supply a fixed amount of labour L and have no initial bonds B or capital K . The discount factor is $\beta \in (0, 1)$, P is equal to one and the interest rate is constant and equal to i . Given these assumptions, our budget constraint is equal to:

$$C_1 + \frac{C_2}{1+i} = W_1 L + \frac{W_2 L}{1+i} - G_1 - \frac{G_2}{1+i} \quad (2)$$

- (a) Write down the Lagrangian. **[5 marks]**
- (b) Derive the first order conditions. **[5 marks]**
- (c) Derive the Euler equation. **[5 marks]**
- (d) Express the consumption level in the first period (i.e. C_1) as function of lifetime income. From your answer, identify the marginal propensity to consume out of lifetime income. **[10 marks]**
- (e) Assume initially $G_2 = G_1$. If G_1 decreases while G_2 increases by twice the amount of G_1 's reduction, how will C_1 be affected? **[5 marks]**

Question 3.**[30 marks]**

1. Consider an economy under monopolistic competition where households consume (C_t) and work (N_t) in exchange of wage W_t . On the other hand, there are a set of monopolistic firms across industries indexed by i who use labor ($N_t(i)$) to produce goods ($Y_t(i)$) that are sold at a price $P_t(i)$ which they determine subject to an isoelastic demand. Assume firms are subjects to aggregate productivity shocks of the shape $A_t = \rho A_{t-1} + \epsilon_t^a$, where $\rho \in [0, 1)$ and $\epsilon_t^a \sim N(0, \sigma_\epsilon)$. Also, assume firms produce only using labor, i.e. $Y_t(i) = A_t N_t(i)^\alpha$, and paying a wage W_t .

- (a) Solve the firm's problem,

$$\max_{P_t(i)} \Pi_t(i) = P_t(i) Y_t(i) - C(Y_t(i)) \quad (3)$$

$$\text{s.t. } Y_t(i) = \left(\frac{P_t(i)}{P_t} \right)^{-\eta} Y_t \quad (4)$$

[5 marks]

- (b) Find the equilibrium conditions for the goods and labour markets considering $P_t C_t = W_t N_t + \Pi_t$ **[10 marks]**
- (c) What variables are affecting the equilibrium? Explain briefly. **[5 marks]**
- (d) Now assume that prices are flexible. What is going to happen in this economy if A_t goes up because of a positive productivity shock? (Intuition is enough) **[5 marks]**
- (e) Assume prices are sticky and the government raises wages by law. What will happen in this economy? Are households better off? (Intuition is enough) **[5 marks]**

Turn Over

End of Paper

End of Examination