

ECT3
ECONOMICS TRIPOS PART IIB

Friday 23 May 2014 2:00-5:00

Paper 2

MACROECONOMIC PRINCIPLES AND PROBLEMS

Candidates are required to answer **FOUR** questions only.

Each question will carry equal weight.

Write your **candidate number** (not your name) on the cover of each booklet.

Write legibly.

STATIONERY REQUIREMENTS

20 Page booklet x 1

Rough work pads

Tags

**SPECIAL REQUIREMENTS TO BE SUPPLIED FOR THIS
EXAMINATION**

Calculator - students are permitted to bring an approved calculator

You may not start to read the questions printed on the subsequent pages of this question paper until instructed that you may do so by the Invigilator.

- 1
 - (a) What is “the New Keynesian Phillips curve” approach?
 - (b) What are the advantages and disadvantages of this approach?
 - (c) What if any are the advantages of the Mankiw-Reis “sticky-information” approach compared with “the New Keynesian Phillips curve?”

- 2
 - (a) In what ways can the Neoclassical growth model explain why some countries are rich while others are poor?
 - (b) What is the role of institutions in economic development?

- 3 Testifying before the U.S. Congress in 1960, economist Robert Triffin exposed a fundamental problem in the international monetary system:
 - If the United States stopped running balance of payments deficits, the international community would lose its largest source of additions to reserves. The resulting shortage of liquidity could pull the world economy into a contractionary spiral, leading to instability.
 - If U.S. deficits continued, a steady stream of dollars would continue to fuel world economic growth. However, excessive U.S. deficits (dollar glut) would erode confidence in the value of the U.S. dollar. Without confidence in the dollar, it would no longer be accepted as the world’s reserve currency. The fixed exchange rate system could break down, leading to instability.
 - (a) Discuss the determinants of the progressive erosion of ‘confidence’ in the U.S. dollar convertibility throughout the 1960s, assessing the role played by the mismatch between international dollar circulation and gold reserves.
 - (b) Is this dilemma entirely a result of the debt and budget policies in the country issuing the international reserve currency? Discuss.

- 4 In July of 2012 the President of the European Central Bank stated that he was “...ready to do whatever it takes” to preserve the Euro as a single currency of the European Union. Critically evaluate the economic justification for this policy. What further measures does the Euro Area need to take in order to ensure that this guarantee continues to be credible?

- 5 In the context of Poole’s analysis for the choice of a policy instrument, under what conditions should the monetary authority target a monetary quantity rather than an interest rate? Explain the assumptions underlying the analysis.

- 6 Consider the following model with monopolistic competition. There is a continuum of households each of which owns a firm and provides labour for some firm other than its own. Households maximise utility

$$U_i = C_i - \frac{1}{\gamma} L_i^\gamma$$

subject to their budget constraint

$$PC_i = P\Pi_i + WL_i$$

where C_i , L_i and Π_i are consumption, labour supply and profit of the firm owned by household i respectively, P is the aggregate price index and W is the nominal wage rate. Each firm produces a differentiated good and goods are imperfect substitutes. The demand for the good of firm i is

$$Q_i = Y \left(\frac{P_i}{P} \right)^{-\phi}, \quad \phi > 1$$

where Y is average real output, P_i is the price of the good of firm i . The production function for a firm i is $Q_i = L_i$, where Q_i is real output of firm i . The labour market is perfectly competitive. Firms maximise profits, subject to their production function. Aggregate demand is given by $Y = M/P$, where M is money supply.

- (a) Assuming that all households and firms are identical, derive the equilibrium real output Y and equilibrium price P in this economy. What happens to these when the parameter ϕ increases? Explain.
- (b) Derive the equilibrium real output in the absence of labour markets, i.e. in a variation of the model where households work for their own firm. Explain the difference with the result obtained in part (a).
- (c) Assume that $\phi = 2$ and $\gamma = 2$ and that the firms face a menu cost $Z = 0.001$ if they change their prices. Assume that money supply increases by 5% ($\Delta M/M = 0.05$). Would it be optimal for the firms to keep their prices fixed? Interpret your results.

- 7 Consider a continuous-time Solow growth model. The production technology is represented by:

$$Y(t) = K(t)^\alpha L(t)^{1-\alpha}, \quad \alpha \in (0, 1),$$

where $Y(t)$ corresponds to output, $K(t)$ is the capital stock, and $L(t)$ is labour. Population grows at constant rate n and agents save a fraction $s \in (0, 1)$ of income. The economy is closed which implies that investment equals savings. Capital evolves according to the following equation of motion:

$$\dot{K}(t) = q(t)I(t) - \delta K(t), \quad \delta > 0,$$

where $I(t)$ denotes investment and δ is the depreciation of the capital stock. Variable $q(t)$ corresponds to the inverse of the relative price of machinery to output. Assume that this relative price is declining over time, such that $\frac{\dot{q}(t)}{q(t)} = \gamma > 0$.

- (a) Write down the equilibrium equation that describes the evolution of capital per unit of labour. What is the long-run growth rate of output per unit of labour along the Balanced Growth Path? Explain.
- (b) Does the economy converge to this Balanced Growth Path equilibrium? Explain. (Hint: Show how the system can be made stationary.)
- (c) What is the equilibrium level of output per unit of labour along the Balanced Growth Path equilibrium?
- (d) Show the dynamics of the output per unit of labour after a permanent increase in γ , which corresponds to the inverse of the relative price of machinery to output. Explain.

- 8 Consider a version of the Mundell-Fleming model allowing for a country's risk premium ϖ :

$$IS : Y = \frac{1}{1 - \Phi_C + \Phi_Y} \left[\left(\bar{A} + \Phi_{Y^*} Y^* \right) - \Phi_{r_L} (i + \Phi_{\varpi} \varpi - \bar{\pi}_{t+1}) + \Phi_e e \right]$$

$$LM : \frac{\mathcal{M}}{P} = \Psi_Y Y - \Psi_i i$$

$$BP(UIP) : (\bar{e}_{t+1} + \varpi) - e = i - i^*$$

A positive shock to ϖ means that international investors require a higher rate of return to invest in financial and real assets issued by the country. Above, Greek (upper case) letters denote parameters, assumed to be positive, and:

Y (Y^*)	output (foreign output)	i (i^*)	(risk-free) nominal interest rate (foreign)
\bar{A}	autonomous spending	$\bar{\pi}_{t+1}$	expected inflation
P	price level	ϖ	country risk premium
\mathcal{M}	nominal money supply	e (\bar{e}_{t+1})	exchange rate (expected)

- (a) Analyze the effects of an increase in ϖ under (1) fixed and (2) flexible exchange rates. Explain carefully the mechanisms under which, according to the model, the central bank may/may not be able to stabilize the economy. For each regime discuss the change in (i) the level of output, (ii) the composition of aggregate demand, (iii) the balance of payments and capital flows.
- (b) According to the model, the risk-premium shock may result in an economic expansion. Provide a critical assessment of the key maintained assumptions under which this is possible, and derive implications for monetary policy.
- (c) Many observers have recently criticized the 'Trilemma' in international finance, stressing that its economic foundations have changed in a world with globalized capital markets, where fluctuations in country risk may create large capital outflows.
 - (i) State the Trilemma, and modify the model so as to allow for capital controls.
 - (ii) In light of your answers to parts (a) and (b), discuss the implications of large 'risk shocks' for the trilemma.

You can carry out your analysis either algebraically or graphically (using the (Y, i) space), or both. State rigorously your arguments, and explain thoroughly your answers.

9 Suppose an economy is characterized by the following equations:

$$\begin{aligned} \text{AS/Phillips curve :} & \quad \pi = \pi^e + ay + e \\ \text{AD :} & \quad y = -b(i - \pi^e) + u \\ \text{Money demand :} & \quad \Delta m - \pi = y + \nu, \end{aligned}$$

where π (π^e) is inflation (expected inflation), y is the output gap, i is the nominal interest rate, Δm is the growth rate in money supply; e , u , and ν are mean-zero, mutually uncorrelated shocks with variances σ_e^2 , σ_u^2 , and σ_ν^2 , respectively, and $a > 0$, $b > 0$. Let the monetary authority implement policy by setting i to minimize the expected value of the loss function

$$L = E \left[\frac{1}{2} \lambda (y - y^*)^2 + \frac{1}{2} \pi^2 \right],$$

where $y^* > 0$ and $\lambda > 0$. The public sets its inflationary expectations prior to the policymaker's setting of i , in the absence of any information on the shocks u , e , and ν , and in accordance with rational expectations.

- (a) Assume first that the policymaker can set the nominal interest rate after observing the shocks e , u , and ν . Find the optimal (discretionary) rule for the nominal interest rate as a function of the shocks and expected inflation.
- (b) Now assume that the policymaker commits herself to the interest-rate policy $i = k_0 + k_1 e + k_2 u$, prior to observing any values for the disturbances e , u , and ν . Find the optimal values of k_0 , k_1 , k_2 .
- (c) Compare the outcomes under the two policies above: do they have the same average inflation, average output, variance of output, and variance of inflation? Does the equilibrium output react to the supply shocks and to the demand shocks? Explain.

END OF PAPER