

ECONOMICS TRIPOS Part IIB

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Tuesday 29 May 2007      1.30 to 4.30

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Paper 2

ECONOMIC PRINCIPLES AND PROBLEMS II

*Answer **four** questions only.*

*Write your number **not** your name on the cover sheet of **each** booklet*

STATIONERY REQUIREMENTS	SPECIAL REQUIREMENTS
<i>20 Page Booklet</i>	<i>Approved calculators allowed</i>
<i>Rough Work Pads</i>	
<i>Tags</i>	

<p><b>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</b></p>
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1. "The first era of of globalisation between 1870 and 1914 was in many ways more successful than the era of globalisation we are experiencing currently". Critically evaluate this statement. In addition explain why if globalisation was so successful pre 1914, it collapsed.
2. Consider an economy where the aggregate demand is given by

$$y = m - p$$

where  $y$  is aggregate output,  $p$  is the aggregate price index and  $m$  is a nominal monetary shock. Suppose that a fraction  $\lambda$  of the firms have rigid prices and a fraction  $(1 - \lambda)$  of the firms have flexible prices, where  $0 \leq \lambda \leq 1$ . Rigid-price firms set their prices (denoted with  $p_r$ ) before the monetary shock is observed, while flexible-price firms set the prices (denoted with  $p_f$ ) after the shock is realised. The aggregate price index is given by:

$$p = \lambda p_r + (1 - \lambda) p_f.$$

Next, suppose that a representative flexible-price firm sets its price according to:

$$p_f = p_i^* = (1 - \psi) p + \psi m,$$

so that the rigid-price firms set prices according to:

$$p_r = E[p_i^*] = (1 - \psi) E[p] + \psi E[m],$$

where  $\psi \geq 0$ .

- (a) Derive  $p_r$ ,  $p_f$  and  $p$  in terms of some combination of  $m$ ,  $E[m]$  and the model parameters  $\psi$  and  $\lambda$ .
  - (b) What are the effects of anticipated and unanticipated monetary shocks on output? Explain.
  - (c) Give an interpretation for the parameters  $\psi$  and  $\lambda$ . What are the effects of an unanticipated monetary shock on output in the extreme cases of  $\lambda = 0$ ,  $\lambda = 1$ ,  $\psi = 0$  and  $\psi \rightarrow \infty$ ? Explain.
3. Why does the requirement in the Stability and Growth Pact of the European Union that fiscal policy should be kept 'close to balance or in surplus' conflict with the UK's Code for Fiscal Stability? Should the rest of Europe adopt a similar code to that of the UK?

4. Consider the basic real business cycle model with inelastic labour supply, log utility of consumption and full capital depreciation. The equilibrium in this economy is described by the expressions:

$$\begin{aligned}\frac{1}{C_t} &= \alpha\beta E_t \left[ \frac{1}{C_{t+1}} Z_{t+1} K_{t+1}^{\alpha-1} \right], \\ K_{t+1} &= Y_t - C_t, \\ Y_t &= Z_t K_t^\alpha, \\ Z_t &= \rho Z_{t-1} + \varepsilon_t, \varepsilon_t \sim iid(0, \sigma^2), \quad 0 \leq \rho < 1\end{aligned}$$

where  $C$ ,  $K$ ,  $Y$  and  $Z$  are consumption, capital, output and an exogenous technological shock respectively. The parameters  $0 < \alpha < 1$  and  $0 < \beta < 1$  are the capital share and the discount factor respectively.

- (a) Give a brief interpretation of these four expressions.
  - (b) Work out the dynamic laws of motion for  $K_{t+1}$ ,  $C_t$  and  $Y_t$  in terms of  $K_t$ ,  $Z_t$  and model parameters.
  - (c) What are the sources of persistence in this model?
  - (d) Is this model a satisfactory theory of business cycles? Explain.
5. "During the 'golden age', in the 1960s, the world economy was able to cope adequately with the fast growth of exports from Japan and Italy to more advanced countries". Why should it not be able now to accommodate a similar growth of exports from China and India?
6. (a) Explain, or show graphically or algebraically how a current account deficit can allow a country to smooth consumption over time.
- (b) Many countries have run current account deficits and faced severe economic downturns during the adjustment to a surplus. How can you reconcile this fact with your answer to part (a)?
- (c) In the light of the possibility of an outcome described in part (b) analyse whether a policy to limit current account deficits would be beneficial?

**(TURN OVER)**

7. (a) Is there any foundation to the argument that all financial crises are caused by governments that maintain fixed exchange rates and run persistent deficits?
- (b) Is there any way of predicting financial crises that would allow countries to avoid them?
- (c) Sovereign debt bankruptcy procedures and massive international bailouts have been proposed to keep the money flowing and to avoid firesales of assets. Discuss whether either of these proposals is feasible.
8. Consider the following three sector model of the economy developed by Romer (1990). Competitive firms (indexed by  $i$ ) in the *final goods sector* maximise profits by producing output  $Y$ , by hiring labour  $L_Y$  and a number of different capital goods  $x_j$  taking the wage  $w$  and rental prices  $p_j$  as given:

$$\max_{L_Y, x_j} Y_i - wL_{Y,i} - \sum_{j=1}^A p_j x_{j,i} \quad (1)$$

$$Y_i = L_{Y,i}^{1-\alpha} \sum_{j=1}^A x_{j,i}^\alpha, \quad 0 < \alpha < 1 \quad (2)$$

$A$  is the number of capital goods that are available to the final goods sector at any point in time. Note that the price of final output is normalised to 1 and capital goods depreciate fully after one period. Producers in the *intermediate capital goods sector* own the monopoly right (patent) to produce capital goods,  $x_j$ . Intermediate producers convert one unit of existing capital (rented at interest rate  $r$ ) into intermediate capital goods. They maximise profits according to:

$$\max_{x_j} \pi_j = p_j(x_j)x_j - rx_j \quad (3)$$

where  $p_j(x_j)$  is the demand function for the capital good in the final goods sector. Scientists in the *research sector* produce new patents using labour,  $L_A$ , and existing technology,  $A$ :

$$\dot{A} = AL_A \quad (4)$$

Assume that labour markets clear, so that  $L_Y + L_A = L = 1$ .

**(TURN OVER for Continuation of Question 8)**

8. (a) Give an economic interpretation of the production function of final output (2). Derive the first-order conditions characterising the wage  $w$  and rental price of intermediate capital goods  $p_j$  paid by each final goods producer.
- (b) Solve for the optimal rental price  $p_j$  charged by intermediate firms producing capital goods  $x_j$ . Solve for profits  $\pi$  and aggregate output  $Y$  as a function of the aggregate capital stock  $K = \sum_{j=1}^A x_j$ . (Hint: each intermediate producer produces the same amount  $x_j = x$ ). Provide a brief economic interpretation of the solutions.
- (c) Using an arbitrage equation for returns in the research sector and the interest rate  $r$ , solve for the optimal price of a patent  $P_A$ . Give an intuitive explanation.
- (d) Derive the equilibrium interest rate  $r$  as function of parameters and the output/capital ratio  $Y/K$ . Give an intuitive explanation of the result.
9. "The neoclassical growth model fits empirical data qualitatively, but not quantitatively." Discuss this statement with reference to:
- (a) convergence of income per capita levels across countries over time;
- (b) evidence on interest rates and capital flows;
- (c) policy conclusions of your analysis in part (a) and (b).

**(TURN OVER)**

10. Assume the Government can control the inflation rate. The relationship for output,  $y_t$ , is given by:

$$y_t = \theta(\pi_t - \pi_t^e) + \epsilon_t$$

$\pi_t$  is the inflation rate and  $\pi_t^e$  is the rationally expected inflation rate formed at the beginning of period  $t$ .  $\epsilon_t$  is an i.i.d random variable, with zero mean and variance,  $\sigma_\epsilon^2$  and  $\theta > 0$ . The loss function is:

$$L_t = E_t\{\pi_t^2 + \delta(y_t - y^*)^2\}$$

where  $E_t$  is the expectations operator,  $y^*$  is the desired level of output and  $\delta > 0$ .

- (a) What is the equilibrium process for output and inflation? Comment on your answer.
- (b) Suppose, now, that the Government decides to delegate the conduct of monetary policy to a Central Banker and asks the electorate to decide on who the Central Banker is to be. Voters have heterogeneous preferences and the loss function of the  $i$ th voter is given by:

$$L_{it} = E_t\{\pi_t^2 + \delta_i(y_t - y^*)^2\}$$

Assume that voting follows the Condorcet method. What sort of Central Banker will be chosen? What is the equilibrium for output and inflation now?

- (c) How would a period of greater volatility in output affect the outcome of the election?

**END OF PAPER**