



ECONOMICS TRIPOS PART IIA

Tuesday 4 June 2013 9:00-12:00

Paper 2

MACROECONOMICS

This paper comprises three Sections, A, B and C.

Answer **ALL FIVE** questions from Section A.

Answer **ONE** question from Section B.

Answer **ONE** question from Section C.

Section A will carry 50% of the marks.

Sections B and C will each carry 25% of the total marks for this paper.

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

Approved calculators allowed

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

SECTION A

- 1 The employment rate, n_t , in an economy evolves according to

$$n_{t+1} = u_t f + n_t(1 - \lambda)$$

where f denotes the job-finding probability, λ the separation rate, and u_t is the unemployment rate in period t . Derive the steady-state unemployment rate, u_{ss} .

Now suppose that both the job-finding probability and the separation rate changes to $\hat{f} = \gamma f$ and $\hat{\lambda} = \gamma \lambda$, respectively, for some $\gamma > 0$. Show mathematically how this change affects the steady-state unemployment rate, and briefly discuss how it may affect the welfare of an unemployed worker.

Lastly, for any $u_t \neq u_{ss}$, how does the above change in the job-finding probability and separation rate affect the transition back to the steady-state rate of unemployment? Is it faster or is it slower? Explain briefly.

- 2 Illustrate the effect of a (lump-sum) tax-financed permanent expansion in government spending on output and on the real interest rate in the context of an intertemporal macroeconomic model. Explain intuitively and use graphs to illustrate your answer. (*Feel free to ignore the presence of investments throughout this question*).

Now suppose that instead of lump-sum taxes, the government must use distortionary labour income taxes to finance its expansion in spending. How does this change alter your answer above? Explain intuitively and use graphs to illustrate.

- 3 Suppose a gilt and an index-linked gilt maturing in 2055 on the same date have a coupon rate of 4.25% and 1.25%, and a redemption yield of 3.40% and -0.06%, respectively. Compute break-even inflation (up to three decimal places). Carefully explain what would be your estimate of expected inflation and the risk-free real interest rate in each case if it is known that (i) the inflation measure used for index-linked gilts is biased and overstates actual inflation by one percentage point, and (ii) the index-linked gilt is less liquid and has a liquidity premium of 50 basis points.
- 4 Suppose the UK government suddenly decides to permanently reduce government purchases. Assume that the UK is a small open economy described by the DD-AA model and is initially at its long-run equilibrium. Carefully explain what would happen to UK aggregate output and the nominal exchange rate in the short run.

- 5 Suppose that a government is in fiscal balance on its current account and the real interest rate, r , is lower than the growth rate of output, γ_y .
- (a) Write down an expression describing the evolution of the national debt-income ratio, explaining the economic intuition.
 - (b) If we start with a positive debt ratio, in the absence of any shocks to the economy how will the debt ratio evolve?
 - (c) Suppose there is a financial crisis that raises the real interest rate and lowers the growth rate so that now $r > g$. How does the debt ratio evolve now, assuming that the current account is kept in balance?

(TURN OVER)

SECTION B

- 6 (a) Consider the following static labour/leisure choice problem

$$\begin{aligned} \max_{c, \ell, L} & \{\ln c + \ln \ell\} \\ \text{s.t.} & \quad c = Lw \\ & \quad 1 = \ell + L \end{aligned}$$

where c denotes consumption, ℓ leisure, L labour, and w the wage rate. Derive the optimal choice of c , ℓ and L . How do the optimal choices depend on the wage rate, w ? Explain intuitively.

- (b) Now consider instead the following version of the above problem

$$\begin{aligned} \max_{c, \ell, L} & \{\ln c + \ln \ell\} \\ \text{s.t.} & \quad c = L(1 - \tau)w + R \\ & \quad 1 = \ell + L \end{aligned}$$

where τ is an income tax, and R is a lump-sum *rebate*. For simplicity, assume that the government rebates all revenue from the income tax. Derive the optimal choice of c , ℓ , and L . Specify your answer in terms of the tax τ . Explain how this answer differs from that of part (a).

- (c) Compute the value of τ that maximises welfare in this setting. Explain the intuition underlying this result.

- 7 Suppose a central bank using monetary targeting minimises the social welfare loss function

$$L = \frac{1}{2}\alpha(\pi - \pi^*)^2 + \frac{1}{2}(y - y^*)^2$$

where π is inflation, y aggregate output, π^* the inflation target, y^* the output target and α a positive parameter. Assume that $y^* = \kappa\bar{y}$, where \bar{y} is the natural rate of output and $\kappa > 1$. The economy is described by the aggregate supply relation

$$y = \bar{y} + \theta(\pi - \pi^e) + s$$

where π^e denotes private sector inflation expectations, s is a white noise aggregate supply shock with variance σ_s^2 , and θ is a positive parameter. The central bank adjusts the rate of money growth m to control inflation:

$$\pi = m + v$$

where v is a white noise velocity shock with variance σ_v^2 .

At the beginning of the period, the private sector forms its inflation expectations π^e using rational expectations. Subsequently, the supply shock s and velocity shock v are observed. Then, the central bank sets its monetary policy instrument m , after which inflation π and output y are realised.

- (a) Derive the rate of money growth m that the central bank sets for a given level of private sector inflation expectations π^e . Explain intuitively how m depends on π^* , y^* , s and v .
- (b) Derive the level of private sector inflation expectations π^e , and the outcome for inflation π and output y . Explain intuitively how π and y depend on π^* , y^* , s and v .
- (c) Compute the expected value and variance of inflation and output: $E[\pi]$, $E[y]$, $Var[\pi]$ and $Var[y]$. Give an economic interpretation of the results.
- (d) Suppose the government decides to delegate monetary policy to a new central banker. Explain the effect on the expected value and variance of inflation and output if the new central banker (indicated by CB) has an objective function with
 - (i) a higher parameter α , such that $\alpha_{CB} = 2\alpha$; or
 - (ii) a lower parameter κ , such that $\kappa_{CB} = 1$.

In each case, discuss whether delegation to such a central banker would be desirable.

(TURN OVER)

Section C

- 8 The United States regularly extends the duration of unemployment benefit payments during recessions. Discuss in the context of models of the labour market how such an extension may affect the behaviour of the unemployment rate, and possible consequences on the subsequent recovery.
- 9 Are government bonds net wealth? Answer this question from the perspective of both an individual bond holder, and of the economy as a whole.
- 10 Since the recent financial crisis, the United Kingdom has faced a challenging global macroeconomic environment in which foreign nominal interest rates declined and foreign output dropped. Analyse the effect of these two changes on the UK economy and discuss how macroeconomic policy could respond to them.
- 11 Since the start of ‘quantitative easing’ (QE) by the Bank of England in March 2009, banks’ reserves at the Bank of England have risen by about £240bn and the monetary base has more than tripled, whereas M4 is about the same. Analyze what the likely effect of QE would have been on reserves, the monetary base and M4 if banks had used it fully to expand their lending, and discuss how the actual effects could be explained.
- 12 ‘The Financial Crisis that started in 2007 has exposed the fragility of the UK Government’s Fiscal and Monetary Policy framework’. Discuss this statement in the light of events since 2007.

END OF PAPER