ECONOMICS TRIPOS PART IIA

2020   2.00pm − 5.00pm

Paper 2

MACROECONOMICS

MOCK EXAM

This paper comprises three sections: A, B and C.

Answer **ALL FOUR** questions from Section A.
Answer **ONE** question from Section B.
Answer **ONE** question from Section C.

Section A will carry 50% of the marks, with each question weighed equally. Sections B and C will each carry 25% of the total marks for this paper.

Write you **name** on the top of your answer sheet.

Candidates are asked to note that there may be a reduction in marks for scripts with illegible handwriting.

If you identify an error in this paper, please alert the **Invigilator**, who will notify the **Examiner**. A **general** announcement will be made if the error is validated.

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.

SECTION A

A.1 The US Federal Government has had funding gaps on 20 occasions since 1974, the most recent caused a government shutdown during the evening of 9th February 2018. Suppose investors are concerned that the US government will temporarily default on its debt payments in 3 months due to a failure to agree on lifting the debt ceiling. Analyse the likely effect of this on the price and yield of US Treasury bills and bonds with a maturity of 1-month, 3-months and 3-years. Use your answer to explain how this may affect the shape of the US yield curve.

A.2 Consider the following stylised household budget constraint:

$$(1 + \nu_1)c_1 + \frac{(1 + \nu_2)}{1 + r_2}c_2 = \bar{y},$$

where c_t denotes real consumption in period-t, ν_t denotes a period-t Value Added Tax (VAT), and $\bar{y}$ is the present discounted value of income (assumed constant). On 24th November 2008, in an effort to combat recession, the UK Chancellor Alistair Darling announced a temporary VAT cut of 2.5pp.

(a) Draw the budget constraint before and after the VAT cut in the present period.
(b) Analyse the likely impact on consumption in both periods. You may assume consumption is a normal good.

A more realistic model would also incorporate credit constraints in the household problem. Assume, due to frictions in credit markets, consumption may be at most $\tau\bar{y}$ in the current period, where $\tau \in (0,1)$.

(c) Illustrate how a change in the credit constraint, τ, may reduce the efficacy of attempts to stimulate current consumption through a VAT cut.

A.3 Consider a real business cycle setup with private consumption and government expenditure. Assume that there is no investment and the economy is closed.

(a) 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.
(b) 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 you answer above? Explain intuitively and use graphs to illustrate.

A.4 On 22nd January 2015, the European Central Bank announced that it would expand its asset purchase programme to include euro area government bonds, along with covered bonds and asset-backed securities. The combined monthly asset purchases were announced to amount to €60bn. On that day, the euro depreciated against the US dollar by 1.5%.

(a) Could this be consistent with the asset market model of the exchange rate. Explain.

(b) On the same day, concern grew that an anti-austerity party would take power in the Greek elections, which were held on 25th January 2015. Explain how the asset market model can be augmented to account for the effects of political uncertainty and risk. To what extent does the increased political uncertainty on 22nd January 2015 reinforce or reverse the exchange rate effects discussed in part (a)?

(c) Using the DD-AA model, assess how an increase in political uncertainty and risk influences macroeconomic outcomes. Explain and evaluate your answer.

SECTION B

B.1 Consider a price-taking representative agent who faces the following optimisation problem:

$$\max_{c_1,c_2,b_2,\ell_1,\ell_2} \{\ln c_1 + \ln \ell_1 + \beta(\ln c_2 + \ln \ell_2)\},$$

subject to:

$$c_1 + b_2 = w_1(1 - \ell_1) - T_1,$$
$$c_2 = w_2(1 - \ell_2) + b_2(1 + r_2) - T_2,$$

where c_t denotes consumption, ℓ_t leisure, b_t savings, T_t lump-sum taxes, w_t the real wage, r_t the real interest rate, and β the intertemporal discount factor $(0 < \beta < 1)$. The subscript $t = 1$, 2 denotes the time period.

(a) Derive the agent's intertemporal budget constraint. Give an economic interpretation of the result.

(b) Find the optimality conditions for c_1, c_2, b_2, ℓ_1 and ℓ_2. Derive the intertemporal Euler equation for consumption, and the intratemporal (i.e. within period) Euler equation characterising the optimal trade-off between consumption and leisure. Give an intuitive explanation of these Euler equations.

Assume that the economy is closed and that there is no investment. So the GDP identity is given by $y_t = c_t + g_t$, where g_t denotes government purchases, which are exogenous, and y_t denotes aggregate output, which is equal to $y_t = w_t(1 - \ell_t)$. Suppose that $w_t = A_t$, where A_t represents productivity in period $t = 1$, 2. In addition, assume that the government runs a balanced budget such that $T_t = g_t$.

(c) Solve for the equilibrium level of output y_t in terms of A_t, g_t and r_t for $t = 1$, 2.

(d) Given our assumption of a closed economy, the general equilibrium condition for bonds states that $b_2 = 0$. Using this information and your optimality condition for b_2 write the real interest rate $1 + r_2$ as a function of A_t and G_t for $t = 1$, 2. Combine this with your answer to part (c) to rewrite the equilibrium level of y_t in terms of A_t and g_t only, for $t = 1$, 2.

(e) Derive the fiscal multiplier dy_1/dg_1 for a permanent increase in g_1. Provide an intuitive explanation of the results.

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B.2 Consider the Bernanke-Blinder extension to the ISLM model. Banks are assumed to hold bonds B, loans, L, and reserves, R, as assets, and have deposits, D, as liabilities, so that the representative bank's balance sheet is:

$$B + L + R = D.$$

Reserves are equal to the legal minimum reserve requirement $R = \tau D$, where $\tau = \frac{1}{3}$. This yields the supply of deposits in the money market:

$$D^s = 3R.$$

The demand for deposits is given by the traditional money demand equation

$$D^d = Y - \frac{1}{2} i_B,$$

where Y is real aggregate output and i_B is the bond interest rate. The supply of loans is described by:

$$L^s = \frac{3}{4}(D - R).$$

The demand for loans is described by:

$$L^d = Y - \frac{1}{4}(i_L - i_B).$$

where i_L is the loan interest rate. The goods market equilibrium is described by:

$$Y = 60 - \frac{1}{4} i_L - \frac{1}{4} i_B.$$

(a) Derive the equilibrium bond interest rate i_B in the money market in terms of output, Y and reserves, R, and the equilibrium loan interest rate i_L in the loan market in terms of output, Y, reserves R and the equilibrium bond interest rate, i_B. Give an intuitive explanation.

(b) Derive output, Y, in terms of reserves, R, and the equilibrium bond interest rate, i_B, such that there is equilibrium in both the goods market and the loan market. Give an intuitive explanation.

(c) Suppose the central bank increases the level of reserves from $R = 10$ to $R' = 12$. Compute the initial and new equilibrium level of output, Y, and the bond interest rate, i_B. Illustrate the effect graphically and provide an economic explanation.

(d) Suppose that the central bank subsequently raises the required reserve ratio to $\tau = \frac{1}{2}$ to address liquidity problems in the banking sector. Explain how this affects the equilibrium level of output, Y and the bond interest rate i_B. Provide a graphical illustration.

SECTION C

C.1 On 22nd December 1994, the Mexican peso depreciated by about 21% against the US dollar at the start of what became known in financial markets as the 'Tequila crisis'. Using examples, discuss what could be the causes of a currency crisis.

C.2 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 has remained almost unchanged. Analyse what the likely effect of QE would have been on reserves, the monetary base and M4 if banks had used it to fully expand their lending. Aside from the bank lending channel, discuss alternative theoretical channels through which QE could have been effective in the UK.

C.3 The United States regularly extends the duration of unemployment benefits 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.

C.4 A pervasive argument in the debate concerning the effectiveness of fiscal policy is of the type: "A dollar spent by the government is a dollar taxed, in the present or in the future. So, government spending cannot stimulate the economy, let alone private demand." Discuss to what extent this argument is faulty, and to what extent it is correct.

END OF PAPER