

This test consists of 2 sections. Answer ALL questions. Within each section all questions have equal weight. You have two hours to complete this exam. You may use a non-programmable calculator.

SECTION A (40 marks): Answer ALL Questions

Answer whether the statement is true, false or uncertain. In each case you should explain your answer very carefully. Answers that are not accompanied by an explanation automatically receive a mark of zero. You may find it helpful to use diagrams.

1. If the monetary supply is $M = 500$ the currency-deposit ratio is $cr = 0.2$ and the reserve-deposit ratio is $rr = 0.1$ then the monetary base must be $B = 100$.
2. Assume that shocks to output are persistent. This means that a central bank can reduce the variance of output by using a feedback rule for monetary policy.
3. According to the Lucas critique policy makers cannot rely upon a single Phillips curve relationship between inflation and unemployment to predict the effects of changes in monetary policy.
4. The government finances a tax cut in period 1 by issuing debt. The debt must be repaid in period two and so the government levies a lump-sum tax on households in period 2. As a result, household consumption choices are unchanged.
5. The first step in fighting high inflation maybe fiscal reform rather than monetary reform.

SECTION B (40 marks): Answer BOTH Questions

1. Consider a policymaker who wants to keep inflation (π) as low as possible, but would also like to keep unemployment (u) as low as possible. Its preferences are described by the following loss function:

$$L = \alpha\pi^2 + u \quad (1)$$

This central bank sets inflation using monetary policy and unemployment in this economy is determined by the following Phillips curve:

$$\pi = \pi^e - 0.5(u - 4) \quad (2)$$

where π^e is the public's expectation of inflation.

- (a) In 2014 the policymaker announces that it will set the inflation rate at zero in 2015. What are the values of the unemployment rate and the loss function in 2015 if the public believe this announcement and the policymaker keeps the promise? [3 MARKS]

- (b) Suppose that the public believe the policy announcement. Find the policymaker's optimal choice for π . What are the values of the unemployment rate and the loss function in this scenario? [4 MARKS]
- (c) Does the policy announced in 2014 satisfy Bellman's principle? Carefully explain your answer. [3 MARKS]
- (d) What are the Nash equilibrium values of inflation, unemployment and the loss function in this economy when the public has rational expectations? Carefully explain the intuition behind your answer. Use a diagram to illustrate your answer. [8 MARKS]
- (e) Explain how the Nash equilibrium level of inflation depend on the parameter α . [2 MARKS]
2. Suppose a government lives for three periods. It makes an exogenous amount of government expenditures each period. These have real value of $G_1 = 150$, $G_2 = 100$ and $G_3 = 50$. It also charges households a lump sum tax, T_t each period. This government does not have to raise sufficient taxes to cover expenditures each period. Instead it can issue bonds which pay a real return $r = 0.1$. These bonds have a maturity of one period. The government begins its life with no debt and must end its life with no debt. Assume that there is no money in this model and the government makes no transfer payments.
- (a) Write down the government's budget constraint in each of the three periods. [4 MARKS]
- (b) Suppose that initially the government wants to set a smooth path taxes, that is $T_1 = T_2 = T_3 = T^*$. Find T^* and the stock of outstanding government debt at the end of each period. [6 MARKS]
- (c) Now suppose that the government decides to balance its budget every period. That is, $T_t = G_t$ for $t = 1, 2, 3$. Assume households discount the future at a rate of $\frac{1}{1+r}$. What is the aggregate wealth effect of this policy change? Explain the intuition behind you answer. [6 MARKS]
- (d) Now suppose that households discount the future at a rate of $\frac{1}{1+R}$ where $R = 0.2$. Does this change your answer to part (c)? If so how? If not, why not? In either case explain the intuition behind your answer. [4 MARKS]