Supervision questions for Part IIa Macroeconomic Policy
Easter **2012**

Question 1

1 Consider the following macroeconomic model. Aggregate demand is given by:

$$y_t = m_t - p_t + v_t \tag{1}$$

and aggregate supply by:

$$y_t - y_t^p = \beta(p_t - {}_{t-1}p_t^e) \tag{2}$$

where y is the log of real output, y^p is the log of trend output, m is the log of the money stock, p is the log of the price level and v is the log of (constant) velocity. The subscript t indicates the time period. ${}_{t-1}p_t^e$ is the expectation formed in period $t-1$ of what the price level will be in period t. It is assumed that the policymaker follows a rule for the stock of money of the form

$$m_t = \alpha y_{t-1} + \epsilon_t \tag{3}$$

where ϵ_t is a zero mean surprise shock to monetary policy.

(a) Suppose expectations are formed adaptively. Write down an expression for how expectations are formed in this case and comment on the properties of this relationship.

(b) There a single positive shock to ϵ in period t. Show diagrammatically how output and the price level return to equilibrium. Make clear what determines the speed with which equilibrium is re-established.

(c) Suppose now expectations are formed rationally so ${}_{t-1}p_t^e = E(p_t \mid I_{t-1})$. Explain what is meant by this.

(d) What is the effect now on output and the price level of a shock to ϵ_t?

Question 2

2 The relationship describing the evolution over time of the debt to income ratio can be written approximately as:

$$\Delta b = d + (r - g)b \tag{4}$$

where b, is the stock of national debt expressed as a proportion of nominal income, d, is the primary deficit as a proportion of nominal income , r is the real interest rate, and g is the growth rate of real income.

(a) Explain the economic intuition and show how this relationship can be derived from the underlying budget identity of the government.

(b) Suppose that the real interest rate is smaller than the growth rate of the economy ($r < g$). The initial stock of debt is positive and the government runs a primary deficit. Show in a diagram how the debt-income ratio evolves over time and explain what is happening.

(c) Suppose now that the government runs a primary surplus. How does this alter your answer to part (b)?

(d) Suppose now $r > g$. Show in a diagram how the debt ratio now evolves depending upon whether the government runs a primary deficit or primary surplus.