

Written Exam for the B.Sc in Economics 2010-II

Macro B

Final Exam

10 June 2010

(3 hour closed book exam)

Please note that the language used in your exam paper must correspond to the language of the title for which you registered during exam registration. I.e. if you registered for the English title of the course, you must write your exam paper in English. Likewise, if you registered for the Danish title of the course or if you registered for the English title which was followed by "eksamen på dansk" in brackets, you must write your exam paper in Danish.

If you are in doubt about which title you registered for, please see the print of your exam registration from the students's self-service system.

All questions of the three problems should be answered

1. Problem A

1. Explain the Keynes Ramsey rule derived as the result of the consumer's utility maximization.
2. Explain and discuss the validity of Friedman's proposed Constant Money Growth rule. Explain further why most important central banks now days follow the Taylor rule, as opposed to Friedman's rule.
3. Explain the "Overshooting" behavior of exchange rates seen in floating exchange rate regimes, is it consistent with rational behavior of the investors?

2. Problem B

This problem asks the student to investigate the relationship between consumption and taxes. Consider the following utility maximization problem with the usual notation

$$\max_{c_1, c_2} U = u(c_1) + \frac{1}{1+\phi} u(c_2) \quad (2.1)$$

$$s.t. \ c_1 + \frac{1}{1+r} c_2 = \left(Y_1^L - T_1 + \frac{1}{1+r} (Y_2^L - T_2) + V_1 \right) \quad (2.2)$$

where Y^L , V_1 , T denotes labor income, initial wealth and taxes, respectively. Assume further that the utility function is of the form

$$u(c) = \frac{\sigma}{\sigma-1} c^{\frac{\sigma-1}{\sigma}} \quad (2.3)$$

1. Show that the solution for consumption in period 1 is of the form

$$c_1 = \theta \left(Y_1^L - T_1 + \frac{1}{1+r} (Y_2^L - T_2) + V_1 \right), \quad \theta = \frac{1}{1 + (1+r)^{\sigma-1} (1+\phi)^{-\sigma}} \quad (2.4)$$

2. Explain the coefficient θ .
3. Suppose that there is a permanent change in taxes, i.e. that both T_1 and T_2 are changed by the same amount, $dT_1 = dT_2$. Show that in this case

$$\frac{\delta c_1}{\delta T_1} = -\theta \left(1 + \frac{1}{1+r} \right), \text{ when } dT_1 = dT_2 \quad (2.5)$$

show further that when $r = \phi$ we get $\frac{\delta c_1}{\delta T_1} = -1$ and explain this intuitively.

The government's intertemporal budget constraint must hold, such that

$$D_1 + G_1 + \frac{1}{1+r} G_2 = T_1 + \frac{1}{1+r} T_2 \quad (2.6)$$

where D is government debt at beginning of an period and G is government spending.

4. Suppose that government announces that it will change taxes in period 1 and that consumers realize that if the government budget constraint is to hold, this will require a change in period 2 taxes also (we assume that G_1 and G_2 are unchanged). Show that in this case

$$\frac{\delta c_1}{\delta T_1} = 0 \quad (2.7)$$

and explain this result intuitively.

The implication of the result in question 4 is that in any given period it will have no effect on private consumption whether government chooses to finance its expenditure by taxes or by borrowing as long as the intertemporal budget constraint holds. This is known as Ricardian Equivalence between taxes and debt.

5. Give reasons why Ricardian Equivalence is likely not to hold in practice.

3. Problem C

Consider an open small specialized economy of the condensed form

$$\text{AD} \quad : \quad \pi = \pi^f + \frac{\beta_1}{\beta_1} e_{-1}^r - \frac{1}{\beta_1} (y - \bar{y} - z) \quad (3.1)$$

$$\text{SRAS} \quad : \quad \pi_t = \pi^f + \gamma(y_t - \bar{y}) + s_t, \quad \gamma > 0 \quad (3.2)$$

$$\text{Real exchange rate} \quad : \quad e^r = \begin{cases} e_{-1}^r + (1 + h\theta^{-1})(\pi^f - \pi), & \text{if } h > 0, \theta > 0 \\ e_{-1}^r + \pi^f - \pi, & \text{if } h = 0, \theta = 0 \end{cases} \quad (3.3)$$

where

$$z \equiv -\beta_2(r^f - \bar{r}) + \tilde{z} \quad (3.4)$$

$$\hat{\beta}_1 \equiv \begin{cases} \beta_1 + h(\beta_1\theta^{-1} + \beta_2), & \text{if } h > 0, \theta > 0 \\ \beta_1, & \text{if } h = 0, \theta = 0 \end{cases} \quad (3.5)$$

and where fixed exchange rate correspond to the case where $h = 0, \theta = 0$.

Assume that the economy with a fixed exchange rate is in long run equilibrium when, in a single period, there is a positive shock to supply, $s < 0$.

1. Analyze and explain in economic terms the effects of this until the economy is back in long run equilibrium. Compare the effects on real output in the period of the shock with the case where the exchange rate is flexible and explain the difference.
2. Explain in economic terms how the speed of adjustment towards the long run equilibrium is affected when the economy has a floating exchange rate instead of a fixed exchange rate.