

Sample exam: Macro II

From the textbook: Barro, Robert (1997) ; *Macroeconomics* , 5th Ed. , MIT Press

Exercise 1

3.6. What factors determine whether the marginal propensity to consume is less than one or equal to one? Can the marginal propensity to consume be greater than one?

Exercise 2

3.7. Review the effects of the following changes on current consumption and work, distinguishing clearly between wealth effects and substitution effects.

- a) A permanent parallel shift of the production function
- b) A change in the interest rate
- c) A temporary change in the marginal product of labour.

Exercise 3

4.13. The Denominations of currency

Consider how people divide their holdings of currency between large bills (say \$ 100 and over) versus small ones. How would the fraction of the value of currency that someone holds as large bills change with

- a) an increase in the price level?
- b) An increase in a person's real income?
- c) An increase in the interest rate?
- d) A greater incentive to avoid records of payments (for example, to evade taxes or to engage in criminal transactions)?

Given these results, the facts for the United States are not so easy to explain. The fraction of currency held as large bills (denominations of \$ 100 and over) stayed nearly constant – between 20 and 22 % - from 1944 to 1970 . Then the fraction rose steadily to around 60 % in 1995. What do you think explains these numbers?

Exercise 4

9.8. Inventory Investment

Businesses hold inventories of goods, partly as finished products and partly as goods-in-process and raw materials. Suppose that we think of inventories as a type of capital , which enters into the production function. Than changes in these stocks represent investment in inventories. (Typically, economists assume that the rate of depreciation on inventories is near zero)

- a) How does an increase in the real interest rate affect the quantity of inventories that businesses want to hold? What happens, therefore, to inventory investment?
- b) Consider a temporary adverse shock to the production function . What happens to the amount of inventory investment? What do we predict, therefore, for the behaviour of inventory investment during recessions?

Exercise 5

Discuss the effects of an expected increase in the future productivity of workers because of the invention of a new superior training technology.

Exercise 6

Robinson Crusoe lives three periods. He consumes coconuts and owns a coconut tree. In addition, there is a bank from which he can borrow more coconuts or to which he can lend coconuts.

The bank offers three different kinds of contracts. In period 1, RC can borrow or lend coconuts with fixed interest rate, r_1 . The settlement is during the period 2. In addition, RC can borrow or lend coconuts with fixed interest rate, r_{12} . The settlement is during the period 3. Finally, in period 2, RC can borrow or lend coconuts with fixed interest rate, r_2 and the settlement is during the period 3.

RC's objective function is as follows:

$$u(c_1) + \beta u(c_2) + \beta^2 u(c_3)$$

Budget constraints are:

$$c_1 + s_1 + s_{12} \leq e_1$$

$$c_2 + s_2 \leq e_2 + (1 + r_1)s_1$$

$$c_3 \leq e_3 + (1 + r_2)s_2 + (1 + r_{12})s_{12}$$

where e is how much coconuts RC's coconut tree will have in period t , and s are the different contracts RC can take. If s is positive RC is lending to the bank and if s is negative RC is borrowing from the bank.

Notice that RC can borrow or lend infinite amounts of coconuts with fixed interest rate.

a) Write down RC's first-order conditions.

b) Give an economic interpretation to the first-order conditions.

c) Give an equilibrium relationship how r_{12} depends on r_1 and r_2 . That is, express

$$r_{12} = f(r_1, r_2) \text{ and find } f(r_1, r_2)$$

d) What would happen if r_{12} was bigger than $f(r_1, r_2)$?

e) Suppose that $r_1 < r_2$. How is r_{12} related to r_1 and r_2 ? (Hint: you can use the approximation $\log(1+r) \approx r$ for small r)