

## Sample exam: Macro II

1. From the textbook: Barro, Robert (1997) ; *Macroeconomics* , 5<sup>th</sup> 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?

*Marginal propensity to consume: Effect of a change in income on consumption ; Change in consumption during a period relative to the change in income*

*Consider a improvement in the production function. If it is temporary then the effect on the marginal propensity to consume is rather small and if it is permanent then it is close to one. It is also possible that the marginal propensity to consume is greater than 1 , if for example income is growing this period by 10 % and in the next period by 20 %. Then ,due to the expectation of this growth pattern the marginal propensity this period could 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 upward parallel shift of the production function

*→ Assume an upward Shift : pure wealth effect , Consumption an leisure increase, Work effort declines; marg. Propensity to consume close to 1  
(Compare Problem Set 5 , Problem 5.1. )*

b) A change in the interest rate

*→ Production function unchanged  
An increase in  $r$  lowers cost of future periods consumption, current consumption falls , future consumption rises; future leisure relatively cheaper to present leisure, current leisure falls, future leisure increases, thus current work increases and future work decreases*

c) A temporary change in the marginal product of labour.

*(Compare Problem Set 5 , Problem 5.1. )*

### 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?

Use Money demand formula:  $M = P \cdot \phi \left( \begin{matrix} R, Y, TC \\ (-) (+) (+) \end{matrix} \right)$

*As price level increases the holdings of large bills are going to increase, because you have simply to pay higher prices. (extreme case: hyperinflation)*

b) An increase in a person's real income?

*As real income increases it is more likely that you buy more expensive goods and therefore the holdings of large bills are going to increase as well.*

c) An increase in the interest rate?

*An increase in the nominal interest rate is going to reduce the money holdings. It is difficult to say something about the holding of large bills here.*

d) A greater incentive to avoid records of payments ( for example, to evade taxes or to engage in criminal transactions)?

*Possible answer: If you buy a illegal good then you would try to have just the right amount of money with you since you don't expect to get correct change. So you would tend to have small bills with you...*

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?

*With the increasing real interest rate the firms don't want to invest in new capital goods ( investment demand decreases) .So the businesses want to use the existing inventory for producing final goods. The opportunity cost of holding inventory during periods with high real interest rates are high, so the demand for inventory declines; the opportunity cost of not selling a good is also high.*

*In periods with low interest rates the firms would prefer to increase their stock of inventory.*

*(In general, inventories allow the firms to profit from intertemporal substitution by raising production and building inventory when costs are unusually low and cutting production and depleting inventory in the opposite case, when costs are high.*

*When interest rates are high, holding inventory is also not attractive because the present discounted value of future selling prices is lower (due to higher discount factor).)*

- 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?

*Due to the lower productivity it is temporarily bad to produce. So the firm would use the stored inventory goods to produce final goods and serve customers. So the inventory investment could become negative during recessions. On the other side one would expect firms to invest into inventory during booms.*

### **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.

*In the current period one would expect leisure to increase and work to decrease.*

*Consumption would decrease without borrowing.*

*(There is a positive Wealth – and Substitution effect (MPL will increase in the next period.)*

*WE: consume more, increase leisure, decrease work effort*

*SE: leisure relatively more expensive now – increase work effort (higher productivity) and decrease leisure.)*

*Work: ambiguous*

### **Exercise 6**

Compare solution for additional Exercise for chapter 3.