

Econ 304
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1. [10 Marks] According to many economic commentators, an economy that begins to ‘overheat’ (i.e., displays rapid growth in GDP) will generate ‘inflationary pressures’ as higher incomes lead to an increase the demand for goods and services. These commentators were left surprised when several years of rapid expansion in the United States were accompanied by a relatively low and stable inflation (if anything, inflation actually fell). Use the Quantity Theory of Money to provide an explanation of these events for our puzzled commentators. (Take some time to describe and develop the basic elements of the theory).
2. [10 Marks] In class, we studied the social planner’s problem: choose (c_1, c_2) to maximize $U(c_1, c_2)$ subject to the feasibility constraint $c_1 + c_2 \leq y$. Suppose that $U(c_1, c_2) = \ln(c_1) + \beta \ln(c_2)$, so that $MRS(c_1, c_2) = c_2/(\beta c_1)$. Solve for the ‘Golden Rule’ allocation (c_1^*, c_2^*) as a function of y and β . How does the optimal allocation depend on β ? Explain.
3. [10 Marks] Consider two economies A and B. In each economy, the number of young people born in each period is constant at N and the supply of fiat money is constant at M . Furthermore, each individual is endowed with y units of output when young and zero when old. The only thing that differs between the economies is with regard to preferences. In particular, preferences in economy $i = A, B$ are given by $U_i = \ln(c_1) + \beta_i \ln(c_2)$, where $\beta_A > \beta_B > 0$. The marginal rate of substitution for these preferences is given by $MRS_i = c_2/(\beta_i c_1)$. Restrict your attention to stationary equilibria.
 - (a) Will there be a difference in the rates of return on fiat money in the two economies? Explain.
 - (b) Solve for the equilibrium demand for real money balances and the equilibrium value of money in each economy. Explain any differences that may exist.
1. In class it was remarked that convexity of preferences implied a preference ‘consumption smoothing’ across time. Explain.

2. Consider preferences that have an MRS given by $MRS(c_1, c_2) = c_2/(\beta c_1)$, where $\beta > 0$. What does the MRS measure and how does it behave as one increases the level of c_1 holding fixed the level of c_2 ? Explain.
3. The MRS above is derived from the utility function $U = \ln(c_1) + \beta \ln(c_2)$. The parameter β can be interpreted as something that measures a person's patience. Explain.
4. Consider the standard OLG model with zero population growth. Preferences are given by $U(c_1, c_2)$ and individuals have an income stream $(y_1, y_2) = (y, 0)$. The government wishes to purchase a constant amount of output g per young person, which it finances by new money creation $(z - 1)M_{t-1}$. Let R denote the (gross) rate of return on money.
 1. Write down the individual's decision problem for an arbitrary R . What does the solution to this decision problem determine?
 2. Write down the money market clearing condition. What does this restriction determine?
 3. Write down the government budget constraint, together with the restrictions derived in parts (a) and (b). What does this restriction determine?
 4. Suppose that the demand for real money balances (per young person) is given by $q^d = \theta y$, where $\theta = \beta/(1 + \beta)$. Use the restriction in part (c) to solve for the equilibrium rate of money growth z .
5. Let $N_t = nN_{t-1}$ and $M_t = zM_{t-1}$ for every period t , where z and n are both greater than 1. The money created each period is used to finance a lump-sum subsidy of a goods to each *young* person.
 1. Find the equation for the budget set of an individual in the monetary equilibrium. Graph it. Show an arbitrary indifference curve tangent to the budget set and indicate the levels of c_1 and c_2 that would be chosen by an individual in equilibrium.
 2. On the graph you drew in (a), draw the feasible set. Take advantage of the fact that the feasible line goes through the monetary equilibrium (c_1^M, c_2^M) . Label your graph carefully, distinguishing between the budget and feasible sets.

3. Does the monetary equilibrium implement the Golden Rule allocation? Explain.

Instructions. Circle the best answer.

1. The concept of *Rate-of-Return Equality* asserts that:
 1. Money cannot coexist with higher return assets;
 2. Assets with similar risk and liquidity characteristics must have equal expected returns;
 3. The rate of return on money must equal the rate of return on other assets;
 4. All of the above;
 5. None of the above.
2. We say that an asset is *liquid* if:
 1. It can be exchanged easily, quickly, and at little cost;
 2. The asset has the properties of a fluid (e.g., beer);
 3. The asset has the properties of fiat money;
 4. All of the above;
 5. None of the above.
3. Capital goods are illiquid because:
 1. It is difficult to ascertain the value and title of capital;
 2. It is difficult to make change for a piece of capital;
 3. It is difficult to carry capital in your wallet;
 4. All of the above;
 5. None of the above.
4. The term *inside money* could refer to:
 1. Demand deposits at chartered banks;

2. Any liquid private debt instrument;
 3. Money issued by private intermediaries;
 4. All of the above;
 5. None of the above.
5. Private intermediaries that exploit arbitrage opportunities:
1. Will *necessarily* make huge profits;
 2. Will harm an economy's productive capacity;
 3. Should be regulated;
 4. All of the above;
 5. None of the above.
6. Explain the concept of 'reverse causality' and how it relates to pattern of money and output observed in the data. Be sure to (a) Define reverse causality in general terms; (b) Provide an example of reverse causality (that has nothing to do with monetary policy); (c) Describe the pattern of money and output correlations observed in the data; (d) Explain how reverse causality might be employed to explain this pattern; and (e) Explain the economic mechanism that might generate this reverse causality.
7. Assume that the maximum revenue that can be collected from all taxes, including seigniorage, is 1,000,000 units of output. Government expenditures currently total 900,000 units of output. The current leader of the country detests government expenditures but knows that she will not be in power next period. How can this leader use her control over current taxes and the government debt to force her successor to reduce government expenditures? Use the government budget constraint (with constant population) in giving your answer. For simplicity, assume that the initial debt is $b_0 = 0$.