

Macroeconomics B

Problem set 1

This problem set will be collected at the beginning of the next class and marked. If you cannot make it to class you are advised to hand your solutions in before the deadline. No solution will be accepted after the deadline.

Consider a consumer who lives for two period and chooses consumption in each period to maximize the lifetime utility function

$$u(c_1) + \beta u(c_2) \tag{1}$$

with $0 < \beta < 1$ and

$$u(c) = \frac{c^{1-\sigma} - 1}{1-\sigma}, \quad \sigma > 0. \tag{2}$$

The consumer is born with no wealth and her non-stochastic income endowment is y_1 in the first period and $y_2 = Gy_1$, with $G \geq 0$ in the second period of her lifetime. The consumer can freely borrow and lend at the constant, risk-free interest rate r subject to solvency.

1. (a) Write down the consumer sequence problem and derive the Euler equation.
(b) Under what restrictions on β, r, G is it optimal for the agent to consume her income in every period? Under what restrictions is it optimal to save in the first period? Discuss the economic intuition?
(c) Derive the optimal policy function for first-period consumption. Under which conditions does an increase in the interest rate r result in lower consumption in period one if (a) $G = 0$, (b) $G > 0$? Discuss the economic intuition?
2. Suppose that y_1 doubles. What is the associated change in c_1 if
 - (a) $G = 0$;
 - (b) $G = 1$.

Discuss the economic intuition.