- To derive Euler equation, always express C_t+1 in terms of C_t. Remember chain rule.
- To solve for stars, plug Euler equation (after solving for a variable) into lifetime BC.

ECON30024
Shuyun May Li

Tutorial 10 (for Week 11)

1. Review Quiz 10 questions.

2. Suppose an investor lives for two periods, t and $t+1$, and her utility function is given by $U(C_t, C_{t+1}) = u(C_t) + \delta u(C_{t+1})$, where u takes the CRRA form, i.e.,[1]

$$u(C) = \frac{C^{1-\gamma}}{1-\gamma},\ \gamma > 0,\ \gamma \neq 1.$$

   She is born with a wealth of W_t, which can be spent in period t on consumption, C_t, or investment in a risk free asset with rate of return r_{t+1}, S_t. In period $t+1$, the investor spent all her wealth on consumption, C_{t+1}, then passes away.

   (a) Formulate the investor's utility maximisation problem.

   (b) Derive the intertemporal consumption Euler equation.

   (c) Solve for her optimal consumption plan and investment in the risk-free asset, i.e., find $(C_t^*, C_{t+1}^*, S_t^*)$.

   (d) Discuss how the optimal saving S_t depend on δ and on r_{t+1}.

3. ~~Let $u(C) = \frac{C^{1-\gamma}}{1-\gamma}$, find the consumption CAPM prediction to verify equation (11) in Topic 9 slides. Understand this equation, in particular, what is the factor that plays the role of the market return in the CAPM? What is the economic intuition behind the consumption CAPM?~~

[1] This question asks you to work with the most general CRRA utility function. The algebra for part (c) and (d) would be more cumbersome than what you would encounter in the final exam.