ECO–5282
Financial Economics II: Homework #1
Fall 2004
Professor: Carlos Garriga

1. **(Habit formation)** Consider an instantaneous utility function that depends on previous consumption $u(c_{t-1}, c_t)$. Previous consumption affects present consumption, so consumers have to take into account that today's consumption choice will also affect future utility besides the size of the cake.

   (a) Solve the $T-$period cake eating problem using this preferences. Provide some economic intuition of the implied first-order conditions.

   (b) Formulate the Bellman equation for the infinite horizon version of this problem.

   (c) Assume that $u(c_{t-1}, c_t) = \log c_{t-1} + \gamma \log c_t$, compute the optimal value function, and the imply policy function if we assume that $v(W, c_{-1}) = A + B \log W + C \log c_{-1}$.

2. **(Returns to investment)** Consider the standard cake eating problem with a modification of the transition equation for the cake

$$W' = RW - c$$

   if $R > 1$, the cake yields a positive return, whereas if $R \in (0, 1)$ the cake depreciates.

   (a) Formulate the Bellman equation of the infinite horizon problem.

   (b) If preferences are of the form $u(c) = \log(c)$, compute the optimal value function and the implied decision rules.

   (c) Does the size of R matters for the optimal values?