Homework 3 Q&A

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1 Regarding Question 1

Question: For question 1b), do we search for two functions $c_1(\gamma,\, r,\, \rho,\, y_1\; y_2) = ...$ and $c_2(\gamma,\, r,\, \rho,\, y_1\; y_2)$=.... ?
Answer: Your final answer of c1 and c2 should be expressed only in terms of $(\gamma,\, r,\, \rho,\, y_1\; y_2)$

Question: Is there a government or firm in this question?
Answer: No, it is an endowment economy

2 Regarding Question 2

Question: For 2 b), do we need to use total differentials?
Answer: Unfortunately, yes. We want to know the effect of τ on $\{c_1, c_2\}$, thus we would like to know the partial derivative $\frac{\partial c_1}{\partial \tau}$, and $\frac{\partial c_2}{\partial \tau}$. Since we do not know the explicit form of the utility function, we need to use implicit function theorem to solve for the two partial derivatives. For example

$$\frac{\partial c_1}{\partial \tau} = -\frac{\left(\frac{\partial f}{\partial \tau}\right)}{\left(\frac{\partial f}{\partial c_1}\right)}$$

where $f = 0$. To find f, look at the Euler equation.
To save the algebra, you can instead explore

$$\frac{\partial c_1}{\partial R}$$

where $R = 1 + (1 - \tau)\, r$, thus increase in τ means decrease in R. This will (partially) decrease your algebra

Question: For question 2, can we assume the utility function is separable?
Answer: Yes, you can assume the utility function

$$u\left(c_1, c_2\right) = u\left(c_1\right) + \beta u\left(c_2\right)$$

just as in lecture note, this will reduce your algebra pain

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