

6E:204 Macroeconomics
Assignment 10

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1. Consider the following monetary search model. There is a continuum of agents, and each agent has preferences given by

$$E_0 \sum_{t=0}^{\infty} \beta^t u(c_t).$$

Half of the population consists of type 1 agents, and the other half are type 2 agents. Each period, every agent is matched at random with another agent. The probability that an agent meets with someone of his or her own type is α , and he or she meets the other type with probability $1 - \alpha$, where $0 < \alpha < 1$. An agent can produce one unit of an indivisible good at the end of each period at no cost. In period 0, a fraction M of agents of each type are endowed with one unit each of indivisible fiat money. Assume free disposal. An agent can hold at most one unit of some object at a time, and cannot simultaneously hold goods and money. An agent cannot consume the good that he or she produces. However, a good produced by another agent of the same type can always be consumed, yielding utility u^* . There is a probability x that the good produced by an agent of the other type will be something that an agent will like. Therefore, if a type i agent meets a type j agent, where $j \neq i$, then there is a probability x that the type j agent could produce a good that the type i agent would like. If the agent likes the other agent's good, consumption of the good will yield utility u^* , but if the agent does not like the good, then it would yield zero utility.

- (a) Determine all of the steady state Nash equilibria.
 - (b) Rank these equilibria in terms of welfare and explain your results. In particular, how do α and x matter for your welfare results?
2. Consider a representative agent economy where the representative consumer has preferences given by

$$E_0 \sum_{t=0}^{\infty} \beta^t \ln c_t.$$

In this economy there are two productive technologies. Technology 1 produces $\theta_i y_i$ units of consumption goods in state i , for $i = 1, 2$, while technology 2 produces $(1 - \theta_i)y_i$ units of consumption goods in state i , $i = 1, 2$. Assume that $y_1 > y_2$, $\theta_1 y_1 > \theta_2 y_2$, and $(1 - \theta_1)y_1 < (1 - \theta_2)y_2$. Let s_t denote the aggregate state, where $s_t \in \{0, 1\}$. Assume that $\Pr[s_t = i \mid s_{t-1} = i] = \pi$, for $i = 1, 2$, where $\pi > \frac{1}{2}$. In this economy, there are two assets traded: shares in technologies 1 and 2. There is a supply of one share in each technology in existence, and ownership of each share is a proportional claim on the output from that technology.

- (a) Determine the prices of each share in each state of the world. Do share prices move procyclically or countercyclically?