Ec 517
Spring 2017
Christophe Chamley

Assignment 2
(Due February 9)

I. Consider the model with "crazy" agents that we saw in class on February 2, with 2 states, 2 signal values and agent chooses, in sequence, action 1 (with a cost c) or action 0. The "crazy" agent (who occurs with probability π in each round) is now an agent with no private signal. Assume that $\mu_1 > c = 1/2$ and that there is no cascade in the first period. Rational agents have a symmetric binary signal such that the signal is equal to the state with probability q.

1. Determine the evolution of the public belief from μ_1 to μ_2 after each case $x_1 = 1$ and $x_1 = 0$. Which case do you think is more informative. (You will make your own definition of informative). Provide an intuitive description.
2. Show that the condition on the public belief for a cascade is independent of the probability π of a crazy agent. Provide an intuitive explanation.
3. Determine the condition on the public belief for a cascade with $x = 1$ and for a cascade with $x = 0$.

II. There are $N = 8$ persons, each person i receives a signal s_i that is taken randomly from a uniform distribution on the interval $(-10, 10)$. There are two actions a and b. The state of nature is defined as A if $\sum_1^8 s_i > 0$ and B is the sum is negative. Note that each agent cannot observe the signal of others. Each agent knows the structure of the model and makes a decision in turn after having observed the decisions of the previous agents. Agent 1 does not observe any one, agent 2 observes the action x_1 of agent 1 and so on. Note that an agent does not communicate the value of his signal but only his action. At the end, after all agents have made a decision, the state is revealed. The payoff of action is M if the action corresponds to the state (s for A, b for B) and to zero otherwise. Agents maximize their expected payoff.

1. Determine the decision rule of the first agent. Show that it is a "cut-off rule" by which the agent takes action a if s_1 is greater than some value.
2. Determine the decision rule the second agent if $x_1 = 1$.
3. Determine the decision rule of the third agent after the following sequences $x_1 = 1, x_2 = 1$, $x_1 = 1, x = 0$, $x_1 = 0, x_2 = 1$. Compare the results, in particular the last two. Comment.
4. Can a cascade take place in this setup?

III. Browse the article by Huck and Oechssler (2000) that is attached to an email to you. Read carefully Sections 2 and 3. Provide a 1-2 page summary and comment. This part of the assignment should be typed.