

Problem 3

Fragility of social learning

The problem gives a simple example of the mechanism that is analyzed in Bohren (JET, 2016) and Frick *et al.* (2020).

Consider the model of social learning with two states, 0 and 1, two actions 0 and 1 with a cost of investment equal to c . The prior belief (probability of state 1) is μ_1 . Any agent t has a signal $s_t = \theta + \epsilon_t$, where $\epsilon_t \sim \mathcal{N}(0, \sigma^2)$. Assume that the true state is 1.

1. Does the belief converge? If yes, what is the limit? Does the sequence of actions eventually become a herd?
2. Assume now that in each round, with probability π , the acting agent is a “noisy” agent who does not invest, because his cost is greater than 1. Rational agents know the model and the probability π . Answer the previous question.
3. Assume that now that rational agents are not aware of the existence of noisy agents. (They think that $\pi = 0$). To make the case interesting, assume that π is very small. Answer the previous question and comment on the case where π is very small. You may give an informal answer.

The last question is an example of the fragility of social learning, as analyzed in To some extent, this fragility is related to the slow social learning when the decision model of others is uncertain, (see Vives, 1993).

References

- Bohren, J. Aislinn. 2016. “Informational herding with model misspecification,” *Journal of Economic Theory*, 163: [222-247](#).
- Frick, Mira, Ryota Iijima, and Yuhta Ishii. 2020. “Misinterpreting Others and the Fragility of Social Learning,” *Econometrica*, 88(6): [2281-2328](#).