Reputational Herding

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Reading Group

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Herding behavior: Follow the behavior of the preceding individual independently of own private information.

Reputational Herding:

- Scharfstein and Stein (AER 1990)
- Ottaviani and Sorensen (AER 2000)

Reputational Herding: Scharfstein and Stein (1990)

Agents care about their **reputation** as "able" (Smart or Dumb), where ability represents an aptitude for making decisions.

Key assumption: there are systematically unpredictable components of the investment value. The smart signals are conditionally correlated. "Smart agents observe a piece of the same truth, while dumb observe uncorrelated noise."

Fixing the profitability of the investment, managers will be more favorably evaluated if they take the same decision of the others: **Share the blame**.

Reputational Herding: Scharfstein and Stein (1990)

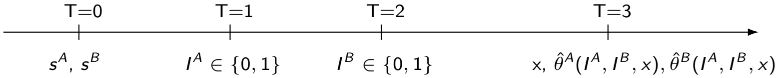
Model:

- Investment decision: $x_H > 0$ in High state, $x_L < 0$ in Low sate, $Pr(High) = \alpha$.
- Two types of managers: Smart (S) or Dumb (D). $Pr(S) = \theta$ prior to **ALL** agents.
- Two managers A and B. They each receive a private signal $s^i \in \{s_G, s_B\}$.
- Signal structure:
- If both A and B are smart: $s^A = s^B$.
- Otherwise, s^A and s^B are conditionally independent.

$$
\begin{aligned}
&Pr(s_G|x_H, S) = p \\
&Pr(s_G|x_L, S) = q < p \\
&Pr(s_G|x_H, D) = Pr(s_G|x_L, D) = z
\end{aligned}
$$

Timing:

- A moves first $I^A \in \{0, 1\}$,
- B observes I^A and chooses $I^B \in 0, 1$,
- x is publicly observed and beliefs about ability updated: $\hat{\theta}^i(I^i, I^j, x)$
- A and B care only about their perceived reputation: $\hat{\theta}$



Reputational Herding: Scharfstein and Stein (1990)

Assumption A1: $Pr(s_G|S) = Pr(s_G|D)$. Agents don't learn about their ability through their signals.

$$z = \alpha p + (1 - \alpha) q$$

Simple example: $q = 1 - p$, $\alpha = \frac{1}{2}$. Assumption 1 implies that $z = \frac{1}{2}$.

Case 1: Only 1 manager

Denote $\mu_G \equiv Pr(x_H|s_G)$, $\mu_B \equiv Pr(x_H|s_B)$.
A follows her signal if:

$$(s_G) \quad \mu_G\hat{\theta}(s_G, x_H) + (1-\mu_G)\hat{\theta}(s_G, x_L) \geq \mu_G\hat{\theta}(s_B, x_H) + (1-\mu_G)\hat{\theta}(s_B, x_L) \quad (1)$$

$$(s_B) \quad \mu_B\hat{\theta}(s_B, x_H) + (1-\mu_B)\hat{\theta}(s_B, x_L) \geq \mu_B\hat{\theta}(s_G, x_H) + (1-\mu_B)\hat{\theta}(s_G, x_L) \quad (2)$$

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Where

$$\begin{aligned} \hat{\theta}(s_G,x_H) &= \frac{p\theta}{p\theta+\frac{1}{2}(1-\theta)} &= \hat{\theta}(s_B,x_L) \\ \hat{\theta}(s_G,x_L) &= \frac{(1-p)\theta}{(1-p)\theta+\frac{1}{2}(1-\theta)} &= \hat{\theta}(s_B,x_H) \end{aligned}$$

$$\mu_G = \frac{p\theta+\frac{1}{2}(1-\theta)}{p\theta+\frac{1}{2}(1-\theta)+(1-p)\theta+\frac{1}{2}(1-\theta)} = 1-\mu_B$$

It is easy to verify that the IC constraints are satisfied (This is true in the general model whenever A1 is satisfied.)

Case 2: 2 managers

Suppose that A follows his signal.

Can B follow his signal as well?

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Suppose that A chooses not to invest ($s^A = s_B$), the IC constraints for B if he receives $s^B = s_G$ become:

$$\begin{aligned} &Pr(x_H|s_B, s_G)\hat{\theta}(s_B, s_G, x_H) + Pr(x_L|s_B, s_G)\hat{\theta}(s_B, s_G, x_L) \geq \\ &\quad Pr(x_H|s_B, s_G)\hat{\theta}(s_B, s_B, x_H) + Pr(x_L|s_B, s_G)\hat{\theta}(s_B, s_B, x_L) \end{aligned} \tag{3}$$

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Note that $Pr(x_H|s_B, s_G) = \frac{1}{2}$. The revised prior becomes:

$$\hat{\theta}(s_B, s_G, x_H) = \frac{\frac{1}{2}p\theta(1-\theta)}{\frac{1}{2}p\theta(1-\theta) + \frac{1}{2}(1-p)\theta(1-\theta) + \frac{1}{4}(1-\theta)^2}$$

and so on...

Case 2: 2 managers

Substituting in the IC constraint, the constraint is violated... B prefers to mimic A and not to invest even if he receives signal s_G.

WHY?

$$\hat{\theta}(s_B, s_G, x_H) > \hat{\theta}(s_B, s_G, x_L), \quad \hat{\theta}(s_G, s_G, x_H) > \hat{\theta}(s_G, s_G, x_L)$$

BUT

$$\hat{\theta}(s_G, s_G, x_H) > \hat{\theta}(s_B, s_G, x_H), \quad \hat{\theta}(s_G, s_G, x_L) > \hat{\theta}(s_B, s_G, x_L)$$

and the second effect dominates...

Case 2: 2 managers

If the signal of the smart managers where also conditionally independent:

$$\hat{\theta}(s_G, s_G, x_H) = \hat{\theta}(s_B, s_G, x_H), \quad \hat{\theta}(s_G, s_G, x_L) = \hat{\theta}(s_B, s_G, x_L)$$

and this second effect disappears.

In that case and under A1, the IC constraints are satisfied (with equality) and it is possible to have a separating equilibrium.

Case 2: 2 managers

Note that pooling forms always part of an equilibrium... because in fact, investing or not is pure cheap talk for the manager...

So there is an equilibrium in which:

- A follows his signal,
- B mimics A independently of his signal.

(B could as well chose the opposite action to A...) Conclusion: as long as the

signals of the smart managers are correlated then we will observe herding by the second manager.

Ottaviani and Sorensen (2000)

Claim: Conditional correlation of the signals is not necessary for herding as long as A1 is not satisfied! Recall: **Assumption A1**: $Pr(s_G|S) = Pr(s_G|D)$. Agents don't

learn about their ability through their signals.

$$z = \alpha p + (1 - \alpha)q$$

Ottaviani and Sorensen prove that if assumption A1 is not satisfied:

- There is still a separating strategy for the first agent.
- Even with independent signals, the second agent mimics the first one.
- When the signal is not binary, reputational herding arises even imposing the non-informativeness assumption A1, and with conditional independent signals.

Why does this herding arise? Is it really herding?