Discussion of “Learning from Private and Public Observations of Others’ Actions”
by Manuel Amador and Pierre-Olivier Weill

Amil Dasgupta
London School of Economics and CEPR

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a forecasting model with social learning

- Continuous time model, continuum of agents, try to forecast state $x$ revealed at random (Poisson) time $\tau$, common prior $x \sim N(0, \bar{P})$.
- Initial information (private and public):

$$z_{i0} = x + \frac{\omega_{i0}}{\sqrt{\pi_0}} ; \quad Z_0 = x + \frac{W_0}{\sqrt{\Pi_0}}$$

- Let $A_t =$ average forecast at $t$.
- Two channels for social learning (private and public):

$$dz_{it} = A_t \, dt + \frac{d\omega_{it}}{\sqrt{P_\epsilon}} ; \quad dZ_t = A_t \, dt + \frac{dW_t}{\sqrt{P_\epsilon}}$$

- Quadratic loss function + continuum assumption $\Rightarrow$ each agent’s optimal action: at any $t$ forecast posterior mean at $t$. 

Discussion of Amador and Weill
how posteriors change over time...

- $\mathbf{x}_it, p_t = \text{time } t \text{ mean, precision, based only on private signals}$
- $\mathbf{X}_t, P_t = \text{time } t \text{ mean, precision, based only on public signals}$
- Construct an equilibrium in which:

\[
\begin{align*}
    a_{it} & = \frac{p_t}{p_t + P_t} \mathbf{x}_{it} + \frac{P_t}{p_t + P_t} \mathbf{X}_t \\
    \frac{dp_t}{dt} & = p_\varepsilon F_t^2 ; \quad \frac{dP_t}{dt} = P_\varepsilon F_t^2 \\
    F_t & = \frac{p_t}{p_t + P_0 + \frac{P_\varepsilon}{p_\varepsilon} (p_t - p_0)}
\end{align*}
\]
private social learning good, public social learning bad

- $F_t$ increasing in $p_\epsilon$ and $p_0$.
- So, private information and private social learning will speed up learning.
- *But* $F_t$ is *decreasing* in $P_0, P_\epsilon$.
- So, public information and public social learning may slow learning.

**Result:** If either $P'_0 > P_0$ or $P'_\epsilon > P_\epsilon$, then:
1. $p'_t < p_t$ for all $t$
2. $p'_t + P'_t < p_t + P_t$ for all large enough $t$

- Making initial public information more precise, or making public social learning more precise slows down overall speed of learning...

Discussion of Amador and Weill
intuition

- Agents learn from observing past actions.
- When public information and learning becomes more precise, each agent’s action becomes more sensitive to (and thus reflects more of) public information.
- But this information is already known to all.
- Public learning “crowds out” private learning.
- If there was no private learning (Vives case), no crowding out; Public learning is good!
negative welfare impact of public information

- Public information (higher $P_0$) increases what all agents know now, but slows down full learning in the long run.

- **Result:** Marginal *increase* in public information can *reduce* welfare if
  1. Uncertainty wont be resolved for a long time.
  2. Amount learned per unit time is high.

- Recall: Only arises if there is a private social learning channel as well.
what we knew earlier, what we know now...

- We knew earlier that:
  1. Public information can reduce welfare in static contexts with payoff externalities (Morris-Shin, Angeletos-Pavan).
  2. Public social learning can reduce welfare when observed variables are discrete and beliefs are bounded (BHW, Banerjee, Smith-Sorensen).
  3. In reputational herding models (e.g., Ottaviani-Sorensen 2006, Dasgupta-Prat 2005) public social learning can reduce welfare even if observed variables are continuous.

- Here, no payoff externalities, observed variables are continuous, beliefs are unbounded.
- Still we get a possible negative impact of public information and public social learning, as long as there’s a private social learning channel as well.
- Nice theoretical result.
Think of a central bank, considering whether to release information. Over time the CB can improve its precision.

Paper shows (formally) that such an information release can reduce welfare, but (numerically) that if the precision of information can be increased enough, then welfare improving (Figure 2).

Fix \( \lambda, p_{\varepsilon}, P_{\varepsilon} \). Ask, what is the minimum \( P_0 \), say \( P_0 \) which would be welfare improving?

Could such a \( P_0 \) be characterized?

If so, this paper, with its dynamic model, opens the door to characterizing when a CB should release a particular piece of information.
comment 2: microfoundations for private social learning

- Costless learning setting – hard to interpret private social learning as direct learning about population average action...
- A natural way to micro-found is to have random sampling (FN 4 mentions an earlier version that does so...)
- But gossip and private interactions are *not* random.
- Way to build up private information about population average – gossip with acquaintances reflects some gossip with acquaintances’ acquaintances.....
- But this information would be very noisy: $p_\varepsilon << P_\varepsilon$
- Doesn’t affect limiting result, but:
  1. How does it affect the length of time required for public information to be harmful?
  2. Figure 2 is presented for $p_\varepsilon >> P_\varepsilon$. How would it change?
comment 3: “less smooth” private social learning

- Even the microfoundation that I proposed involves a degree of “connectedness” in the population.
- Does that hold? If not, could more precise public information play some other role?
- Possibility 1: Reduces “information inequality” (which learning through local interaction cannot achieve in a population that is not fully connected...)
- Possibility 2: If learning through local interaction is costly, and also potentially leads to (socially wasteful?) divergence of opinions, a little bit of public information might shut down endogenous private learning...
- What is the right metric for evaluating the social value of public information?
comment 4: questions

1. The authors say that they construct one equilibrium. Isn’t this equilibrium unique?

2. Difference between Propositions 4 and 5 on the asymptotic effects on public learning due to changes in $P_0$ vs $P_\varepsilon$. Is there some clean intuition?
a few typos

1. Missing $\tau$ integral in (36)?
2. $r$ (presumably a social discount rate?) referred to on page 23, doesn’t seem defined anywhere...
3. Proposition 4, extra “$t > 0$” in penultimate sentence.