

IC: Underlying Value / Payoff

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Basic IC Value Assumption

- ▶ Value (Payoff?) stays the same
 - ▶ independent of time (delay?)
 - ▶ independent of queue position (endog ordering?)
 - ▶ independent of earlier choices (price movements?)
 - ▶ independent of (later) choices (congestion? coordination?)
 - ▶ independent of agent (homogeneous preferences)
 - ▶ (uncorrelated with signal; see later.)
- ▶ \Rightarrow everyone has to make the same decision
 - ▶ Excludes heterogeneity, externalities, etc.

Value Change Effects on Agents

1. Payoff can become different
 2. Invertibility can become different
- ▶ most interesting aspect in our IC context is how different ingredients can change invertibility

Delay and Queue Position

Some Important Papers:

- ▶ Zhang (1997), Chamley-Gale (EMTCA 1994)
 - ▶ function of reaction speed and period length
 - ▶ some delay, then sudden herding on A or R
 - ▶ see Chamley's book
 - ▶ best book introduction (ever)
- ▶ Lee (JET 1993)
 - ▶ immediate (simpler)

Question

In general, if you had a choice as an agent, would you want to go first or later?

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In general, if you had a choice as an agent, would you want to go first or later?

- ▶ delay and queue position are closely related
- ▶ we need some cost to delay (or benefit to being early), or else no one will ever go.

Penguins and Orcas

Question

Are ICs More **Likely** To Set On If All Agents Have More or Less Information?

Are ICs More **Accurate** If All Agents Have More or Less Information?

Lee: What if everyone knows everyone's precision?

- ▶ Assume adopt/**reject** is visible.
 - ▶ A-vs-B choice?
 - ▶ opportunity to act is visible.
- ▶ Who will go first?
- ▶ What will happen next after this first actor?

CG: What would happen if everyone's precision is not public (but privately known)?

- ▶ Relies heavily on equilibrium inference
- ▶ High-accuracy agents have less to lose going earlier
- ▶ Agent sees no one has acted by time t . Act?
 - ▶ e.g., if I know (only) I have highest possible precision, may as well act immediately $t=0$ in eqbm. [boundary condition]
 - ▶ e.g., if I know I have 2nd highest possible precision, maybe wait to see if someone else with higher goes first.
 - ▶ no action? no one with top accuracy info. Me next.

- ▶ Equilibrium condition:
 - ▶ indifferent between waiting for next-best-informed agent to go before me and acting now.
 - ▶ cost of acting earlier: less-informed leads to bad choice
 - ▶ cost of acting later: delay value loss
 - ▶ [difference or differential equation]

- ▶ What will happen next after first guy?

Value Drifts: Temporary Cascades?

- ▶ value changes over time
 - ▶ Extremes: zero redraw. 100% redraw.
 - ▶ in between, for a while, you still have ICs
 - ▶ then it drifts back into relevant space where the value is different enough again to make a reasonable decision
 - ▶ then invertibility is reestablished.

Q: Typically, will it take a long time to drift back into “decision” region?

- ▶ what's the speed and frequency of action changes vs. those of underlying value changes?
 - ▶ Hirshleifer-Welch (2002): inertia
- ▶ See also Moscarini-Ottaviani-Smith (1998), Huang (2022).

Earlier Action (Price) Dependence

Basic Insight

- ▶ Price moves, set by sellers
- ▶ if I bought at \$10, you should not follow buying at \$20
- ▶ competitive sellers will “usually” set price to destroy ICs
 - ▶ ok, assumes risk-neutrality
 - ▶ ok, monopolistic sellers may not (W 1992)
 - ▶ ok, informed vs. uninformed sellers can matter (W 1992)
- ▶ but if P is always set such, actions return to invertible
 - ▶ ICs often naively misapplied to financial markets

Seminal Paper

- ▶ Avery-Zemsky (AER 1998)
 - ▶ Tour de force, but difficult read.
 - ▶ Key Idea: We need multi-dimensional uncertainty in order to scramble invertibility.
 - ▶ Example: number of sellers may also be unknown.
 - ▶ or equivalent, like unknown trader prefs
 - ▶ Two dimensions: get ICs back
 - ▶ Three dimensions: get wrong ICs back
 - ▶ Empirical estimates in Cipriani-Guarino (2014)

Payoff Externalities

- ▶ could call ICs a form of information externality
 - ▶ or insufficient externality (relative to ?)?

Basic Insight

- ▶ Positive payoff externalities reinforce ICs (and vice-versa)
 - ▶ my adopting makes your adopting more valuable
 - ▶ conformity preferences could be positive externalities
 - ▶ VHS? (anyone know what this was?) Myspace? EVs?
 - ▶ reputation effects could be positive externalities

- ▶ Negative payoff externalities push against / balance ICs (and vice-versa)
 - ▶ my adopting makes your adopting less valuable
 - ▶ congestion (waiting), Veeraragharavan and Debo (2011)
 - ▶ depletion
 - ▶ Ester+ (2014)
 - ▶ see also Chamley (2004b)

Future?

- ▶ Rankings and ICs Theory
- ▶ Behavioral Interaction: Envy?
- ▶ Internet and Field Experiments: Tracking of Links and Behavior; Language-Based Data
- ▶ [Anderson-Holt: why irrational behavior? Measure inference?]