Groupthink:

Collective Delusions in Organizations and Markets

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(Forthcoming in the Review of Economics Studies)

Wishful thinking in organizations

- "The Columbia accident is an unfortunate illustration of how NASA's strong cultural bias and its optimistic organizational thinking undermined effective decision-making."

  (Columbia Accident Investigation Board, 2003)

- "Merrill color-blind in a sea of red flags"

  (NYT, May 2008)

- "General Motors' saga was one of decline and denial"

  (WSJ, June 2009)

- "The audit found that [the SEC's Division of] Trading and Markets became aware of numerous potential red flags prior to Bear Stearns' collapse... but did not take actions to limit these risk factors."

  (Inspector General's Report, 2008)

Wishful thinking in organizations

- Corporate, financial, bureaucratic meltdowns: red flags ignored, rationalized away, evidence which refused to see.
- Culture of hubris: this time it is different, we are smarter and have better tools, old ways of thinking no longer apply...
- Groupthink: "A pattern of thought characterized by self-deception, forced manufacture of consent, and conformity to group values and ethics". Janis (1972)'s eight "symptoms":
  - illusion of invulnerability; collective rationalization;
  - belief in inherent morality; stereotyped views of out-groups;
  - direct pressure on dissenters; self-censorship;
  - illusion of unanimity; self-appointed mindguards.

Market manias and crashes

- Suspension of disbelief: housing prices (households), default rates (lenders, regulators), assets risk and ability to get them off balance sheet (banks). Madoff investors...
- Before: Internet bubble,...etc. Recurrent patterns.
- Shiller (2005): "new economic era thinking".
- Reinhart-Rogoff (2009): "The ability of governments and investors to delude themselves, giving rise to periodic bouts of euphoria that usually end in tears, seems to have remained a constant [since 1800]
- Not captured by existing models of bubbles, herding

Asymmetric updating and information avoidance

Experiments: early work in psychology (e.g., Kunda 1987) + recent work by economists eliciting (with incentives) subject's beliefs, show:

- Systematically underrespond to negative news (about IQ, beauty), much closer to Bayesian for positive news. Also, pay to avoid learning true rank at the end. (Eil and Rao 2010, Möbius et al. 2010)
- Reverse predictions about binary lottery as a function of stake in its outcome (Mijovic-Prelec and Prelec 2010).
- Those assigned to be buyers or sellers at random future price make predictions that vary systematically with their monetary stakes in its being high or low (Mayraz 2011).

In the field:

- Mutual funds managers trade more actively after good signals on ability, but no adjustment in trading aggressiveness after bad ones (positive vs. negative realized excess returns). (Choi and Lou 2010)
- Individual investors also display good-news / bad news asymmetry
  – In recall of their portfolios' past returns (Goetzman and Peles 1997)
  – In informational decisions: more look up online value of their portfolios when market is up than down (Karlsson et al. 2009).
- Avoidance of decision-relevant tests for fear of learning of a bad outcome also extensively documented in medical sphere.

Firms and markets

- Many instances of information avoidance (ex-ante), changing standards of evidence (ex-post) and other forms of belief distortion at NASA, FED SEC, Fannie MAE, AIG, investment banks, etc.

- Similar examples in historical studies of financial crises by Mckay (1980), Kindleberger and Aliber (2005), Shiller (2005), Reinhart and Rogoff (2009) $\Rightarrow$ conclusions of contagious "delusions", "manias", "irrational exuberance" and "financial folly".

- Cheng et al. (2012). Compare personal home transactions during housing bubble of 2004-2007 of Wall Street "insiders" = mid-level managers in securitized finance (MBS's etc.), versus real estate lawyers and financial analysts for non-real-estate sector
  = two sophisticated but "outside" groups.

  Insiders more likely to buy a first or second home at the peak, slower to divest as prices started to fall $\Rightarrow$ did significantly *worse*.

- They conclude:

  “Our findings cast doubt on the popular “bad incentives” view of the recent financial crisis that Wall Street employees knowingly ignored warning signs of the housing bubble, as well as the “bad luck” view that the crisis was unpredictable by anyone”.

  “Instead, our analysis highlights distorted beliefs as a potentially important contributing factor to the crisis."

Paper's aims

1. Identify a new, simple and general mechanism generating interdependence in beliefs and actions
   - No payoff complementarities, nor asymmetric information
   - Actions can be anonymous, or not (additional implications)
   - Robust to different preferences leading to motivated beliefs.

2. Analyze how interacts with organizational and market structures $\Rightarrow$ shed light on above puzzles, and others

3. Comparative-statics $\Rightarrow$ predictions, potentially testable, experimentally or empirically.

Economic linkages $\Rightarrow$ cognitive linkages

- Denial = unwillingness to acknowledge bad news / an unpleasant reality

- But: reality is also shaped by how others respond to the news

  - If their denial is beneficial for me $\Rightarrow$ the news / reality is less bad $\Rightarrow$ easier to accept
    $\Rightarrow$ makes me less likely to also engage in denial
  - If their denial is harmful to me $\Rightarrow$ the news / reality is even worse bad $\Rightarrow$ easier to accept

$\Rightarrow$ makes me more likely to also engage in denial

Outline

1. Realism and denial: individual $\Rightarrow$ collective
2. Asymmetric roles and hierarchies
3. Contagious ignorance: the role of risk
4. Welfare, dissenting speech, Cassandra's curse
5. Market "exuberance" and crashes
6. Conclusion

Model

Period 0: information and beliefs

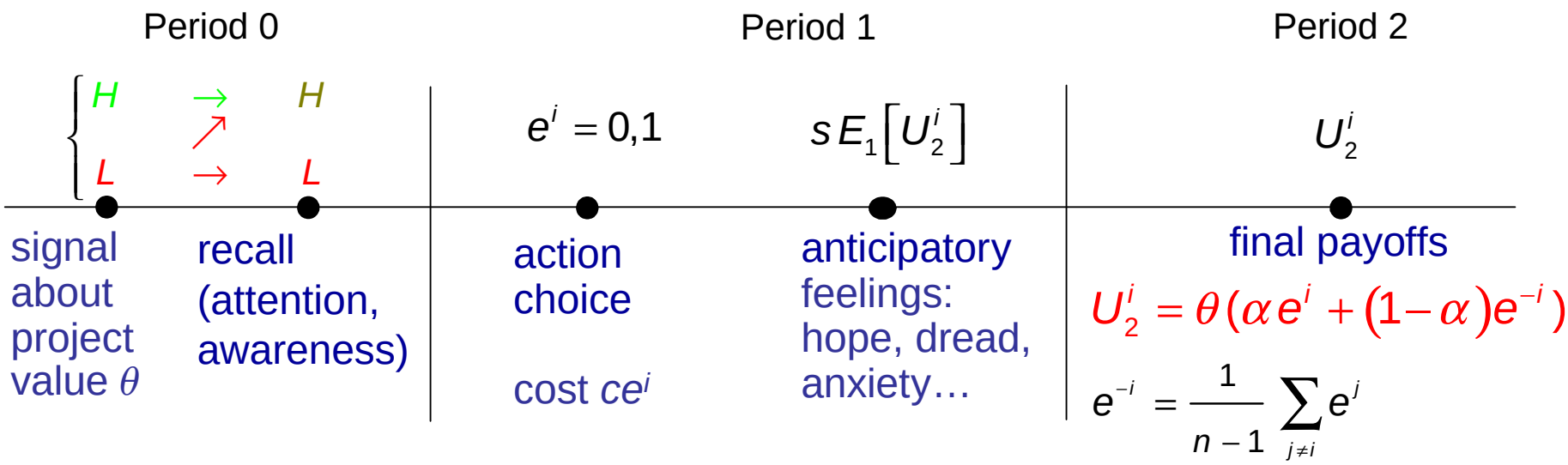
- Common signal about expected value of the project
- Process information: two versions
  - Ex-ante: aquire or avoid
  - Ex-post: acknowledge/retain, or look away/misread/forget.

Period 1: actions... and emotions

- Invest or not in common project: firm, team, policy
- Anticipatory feelings: hope, fear, anxiety from future prospects

Period 2: final payoffs

- Depends (linearly) on own and others' actions
- Affected by overall project value: uncertain



- Period 1: chooses action to maximize

$$U_1^i = -ce^i + sE_1[U_2^i] + \delta E_1[U_2^i]$$

  - acts if confident enough, $(s+\delta)\alpha E_1[\theta] > c$
    prior q sufficiently high to act

- Period 0: cognitive decisions, aiming to maximize

$$U_0^i = -\textit{info costs} + \delta E_0\left[-ce^i + sE_1[U_2^i]\right] + \delta^2 E_0\left[U_2^i\right]$$

  - tradeoff: more pleasant feelings vs. costs, mistakes

Information and beliefs

- Signal H or $L \Rightarrow$ how much attention to pay, how to interpret, whether to "keep it in mind" or "not think about it"

- Intrapersonal game of strategic communication, via attention memory, awareness (Bénabou-Tirole 2002)
  - Realism: acknowledge - encode - recall $H \longrightarrow H$ and $L \longrightarrow L$
  - Denial: ignore - miscode - misremember $L \rightsquigarrow H$ (or $H \rightsquigarrow L$)

    Self-deception, selective inattention, rationalization: cost $m \geq 0$
  - Partial awareness: recall rate $0 < \lambda < 1$, when indifferent

- Alternative cognitive mechanism: information avoidance (not wanting to know) vs. belief distortion (reality denial)
  - No anticipatory utility nor malleable awareness, but preferences for late resolution of uncertainty (Kreps-Porteus 1978).
  - Tradeoff with decision value of information.
  - At $t = 0$, agent chooses whether or not to learn the signal σ.

Sophitication or naïvete

- Agents not free to "choose beliefs". Process information, optimally ($\neq$ objectively) at every stage
- At $t = 0$, aims to maximize

$$U_0^i = -\ m(1-\lambda) + \delta E_0\left[-ce^i + sE_1\left[U_2^i\right]\right] + \delta^2 E_0\left[U_2^i\right]$$

- At $t = 1$,
  - ▷ Being aware of / recalling signal L means state is L for sure
  - ▷ Being unaware of L / aware of H only leads to posterior

$$\Pr\left[\text{ state was } H \mid \text{recall } H\right] = \frac{q}{q + \chi(1-q)(1-\lambda^i)} \equiv r(\lambda^i)$$

where λ^i is agent's equilibrium (habitual) rate of realism

and χ his degree of sophistication. Benchmark case: $\chi = 1$.

Dealing with unpleasant realities (state L)

▷ Respond as a realist $\Rightarrow$

$$U^i_{0,Realism} \equiv \delta(\delta + s)[\alpha \cdot 0 + \underbrace{(1-\alpha)(1-\lambda^{-i})\theta_L}_{\text{only deniers persist}}],$$

▷ Censor $\Rightarrow$ posterior $r(\lambda^i)$ on state really being H $\Rightarrow$

$$U^i_{0,Denial} = -m + \delta(-c + \underbrace{\delta\left[\alpha + (1-\alpha)(1-\lambda^{-i})\right]\theta_L)}_{\text{actual payoff}}$$

$$+\delta \underbrace{s[r(\lambda^i)\theta_H + \left(1 - r(\lambda^i)\right)\left[\alpha + (1-\alpha)(1-\lambda^{-i})\right]\theta_L]}_{\text{anticipatory utility}}.$$

λ^i : i's equilibrium realism (recall of L signals)

λ^{-i} : other agents' equilibrium degree of realism

Dealing with unpleasant realities (state L)

- Incentive to deny, rationalize away red flag, when $1-\lambda^{-i}$ others are doing so

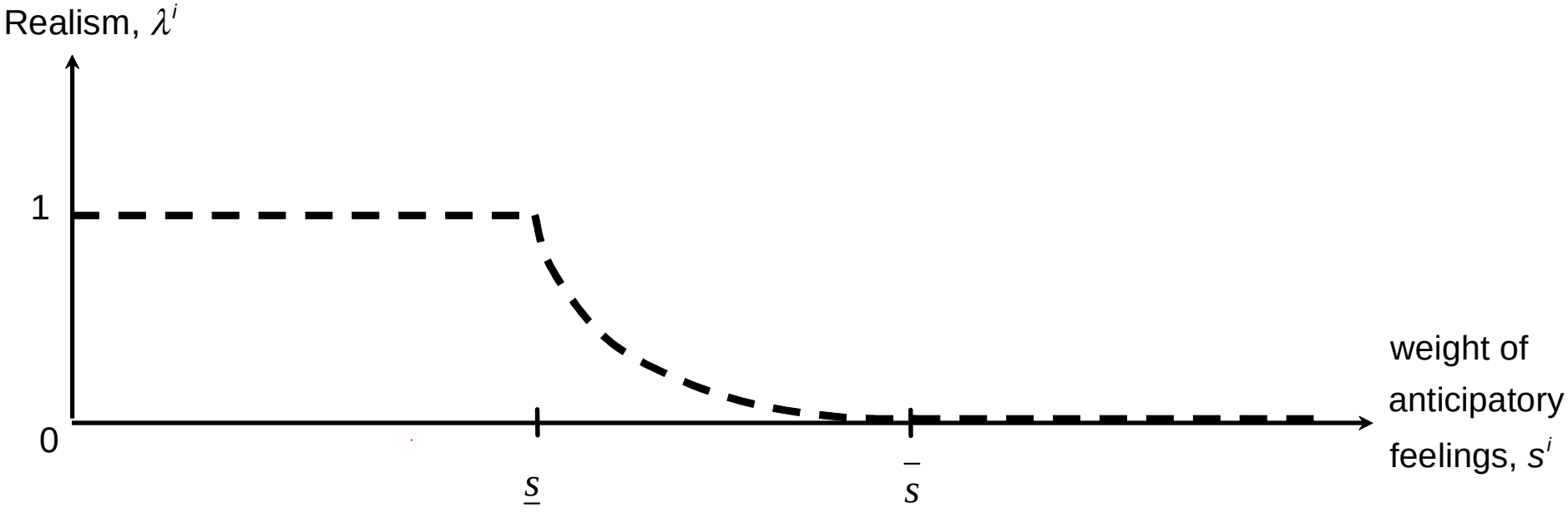
$$U^i_{0,Denial} - U^i_{0,Realism} = -m - \delta \underbrace{[c - (\delta + s)\,\alpha\theta_L]}_{\text{decision error}}$$

$$+\delta s\; r(\lambda^i)\; \delta[\underbrace{\theta_H - (1-\alpha)(1-\lambda^{-i})\theta_L}_{\text{gain in anticipatory utility}}],$$

$$r(\lambda^i) = \frac{q}{q + (1-q)(1-\lambda^i)}$$

- Individual λ^i, given others' λ^{-i}'s.

♦ Optimal awareness



- Agent trades off costs vs. benefits of censoring, disregarding bad news. Fully optimal at every stage.
- Behavior: decisions over information flows, as well as actions
- Key question: how does this tradeoff depend on other's degree of realism or denial?

Dealing with unpleasant realities (state L)

- Incentive to deny, rationalize away red flag, when $1-\lambda^{-i}$ others are doing so

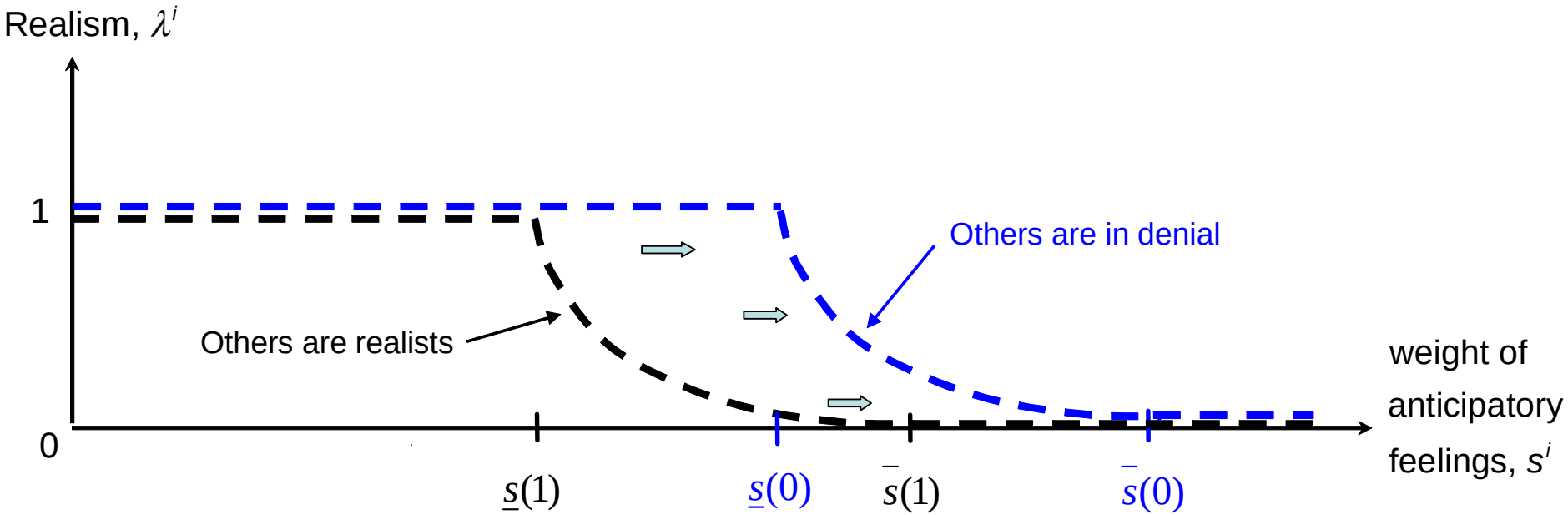
$$U^i_{0,Denial} - U^i_{0,Realism} = -m - \delta \underbrace{[c - (\delta + s)\,\alpha\theta_L]}_{\text{decision error}}$$

$$+\delta s\; r(\lambda^i)\; \delta \underbrace{[\theta_H - (1-\alpha)(1-\lambda^{-i})\theta_L]}_{\text{gain in anticipatory utility}}$$

- Depends on how others' delusions affect reality
- Cognitive linkages

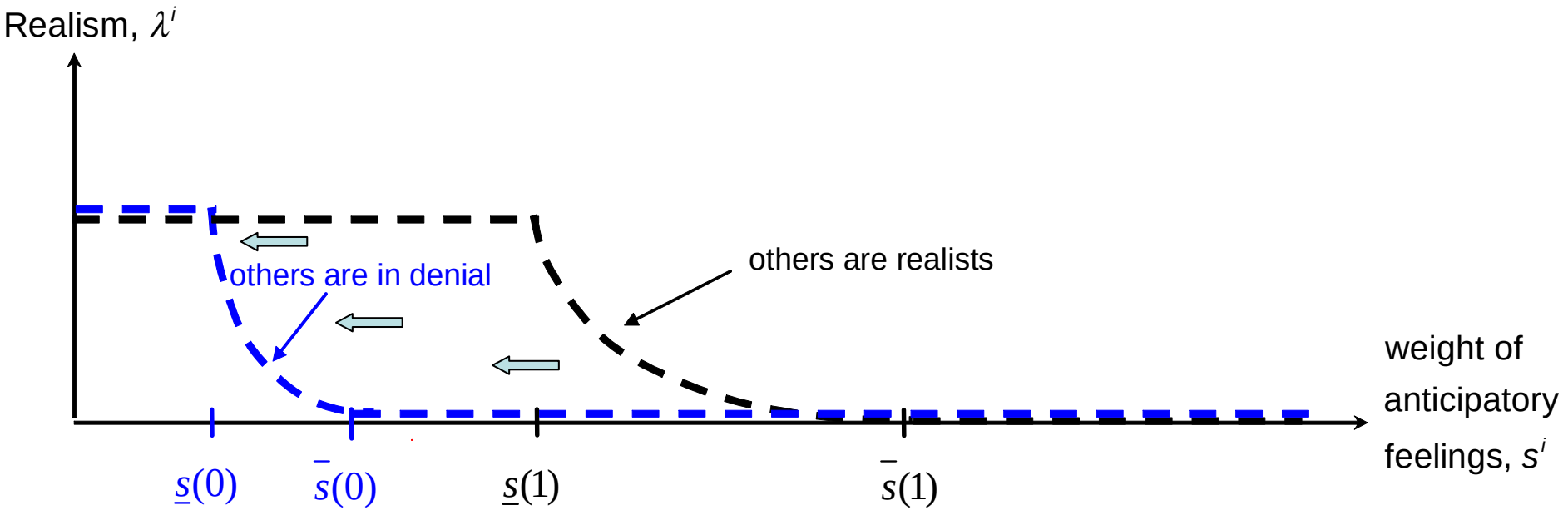
Limited-states project, public good ... $\theta_L > 0$

- In low state, action still has positive expected social value, but below private cost (e.g., sports team, traditional finance)
- Others' disregard of bad news leads them to act in a way that is *better* for an agent than if they were realists $\Rightarrow$
  - makes those news less bad, easier to accept
  - reduces incentive to engage in denial



High-stakesproject or strategy, tail risk $\theta_L < 0$

- In low state, action has negative expected value, both social and private (e.g., Enron, "creative" finance)
- Others' reality denial leads them to make things *worse* for an agent than if they were realists $\Rightarrow$
  - future prospects become even more scary, harder to face
  - increases incentive to look the other way

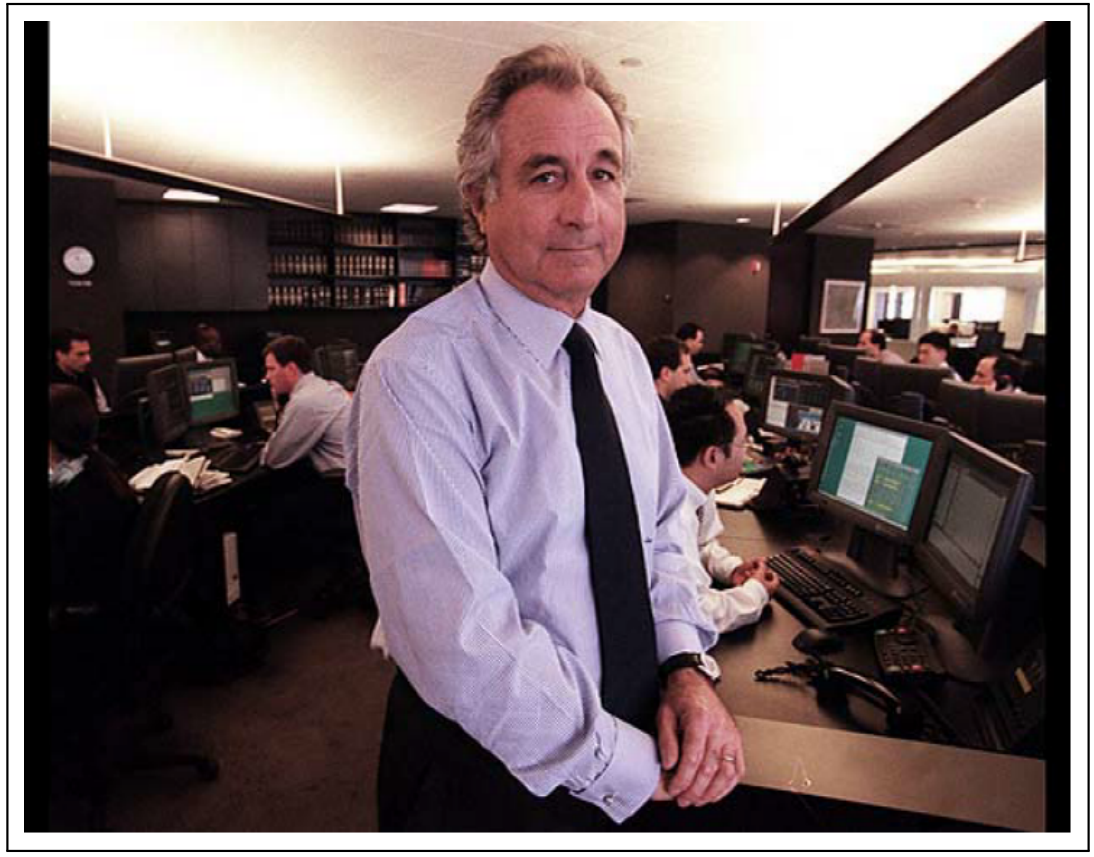


Mutually Assured Delusion (MAD) principle

- When reality avoidance by others is beneficial, individual cognitive strategies are strategic substitutes
- When reality avoidance by others is detrimental, individual cognitive strategies are strategic complements
- New mechanism: "psychological multiplier"

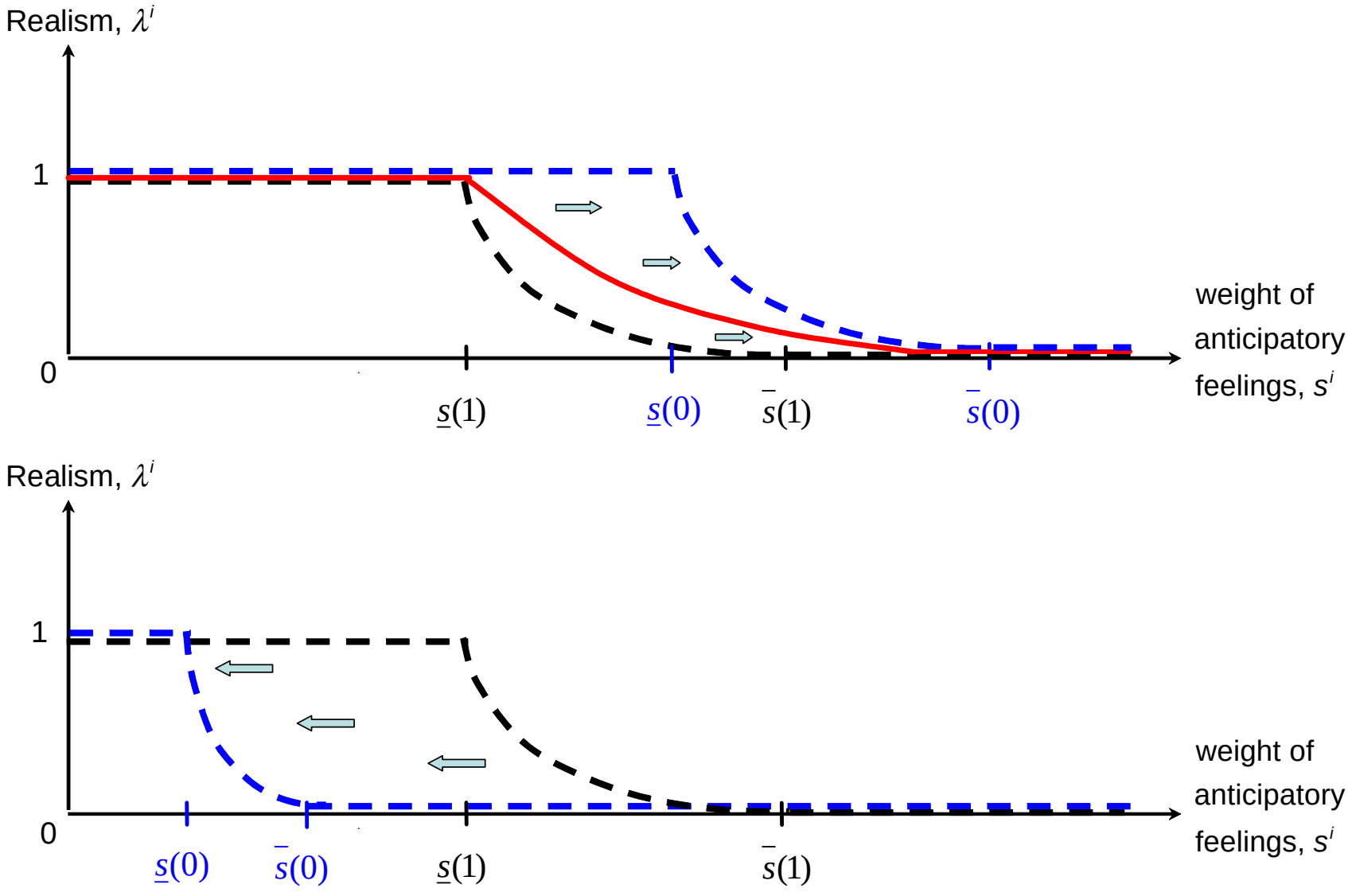
  $\Rightarrow$ interdependent beliefs and actions, although separable linear payoffs, no private information
- Look for equilibrium: corporate culture, social cognition

♦ MADoff Principle ?

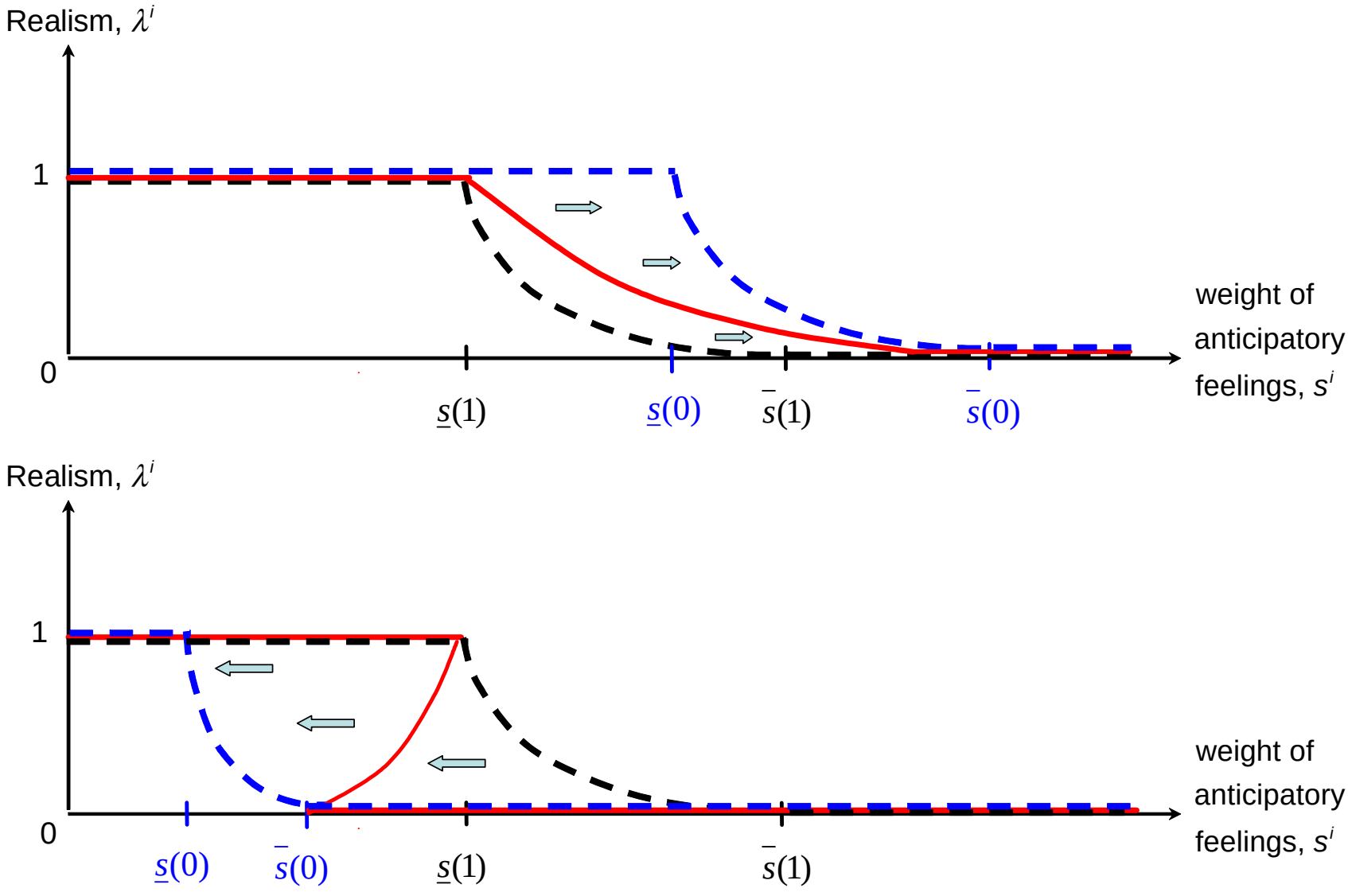


- 12-15% return on your money every year, rain or shine, secret no-risk strategy...
- Fairfield Greenwich Adv. (7.5B), Tremont Group Holdings (3.3B), Banco Santander (2.9B), Bank Medici (2.1B), Ascot Partners (1.8B), Access International Adv. (1.5B), Fortis (1.4B), HSBC (1B), Union Bancaire Privee (.7B)...

Group Morale... $(\theta_L > 0)$



... and Groupthink $(\theta_L < 0)$

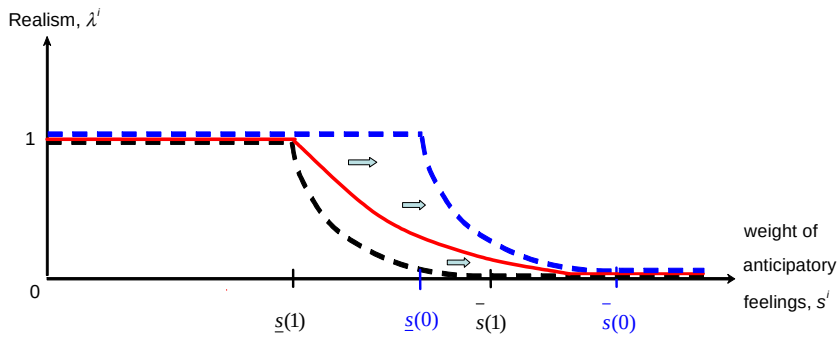


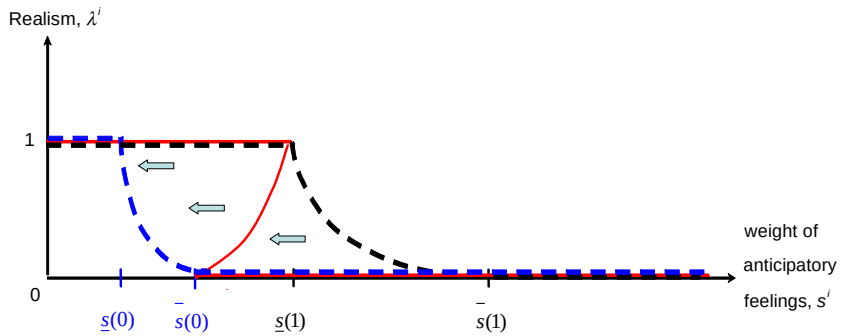
Proposition

1. *Both realism* $(\lambda = 1)$ *and collective denial* $(\lambda = 0)$ *are equilibria, for* s *within some range, iff*

$$Prob(\text{state } L) \times (\theta_H - \theta_L) < (1 - \alpha)(0 - \theta_L).$$

2. *Groupthink more likely when more "common fate", few exit options* $(\alpha \downarrow)$*; more tail risk, worse bad news* $(1 - q \downarrow \theta_L \downarrow)$.





- Culture of denial: all persist in wrong course of action, ignoring the red flags –because others do
- Testable implications (e.g., vary payoff structure in experiments)

Asymmetric groups and corporate cultures

- Extend payoff structure to

$$U_2^i \equiv \sum_{j=1}^{n} \left(a_\sigma^{ji} \; e^j + b_\sigma^{ji} \; (1 - e^j) \right), \quad \sigma = H, L.$$

- Agents may also differ in their costs, preferences, priors

Proposition

Collective realism $(\lambda^j \equiv 1)$ *and collective denial* $(\lambda^j \equiv 0)$ *are both equilibria, for* $(s^1, \ldots s^n)$ *within some range, iff*

$$\textit{Iff, for all } i, \quad \left(1 - q^i\right) \sum_{j=1}^{n} \left(a_H^{ji} - a_L^{ji} \right) < \sum_{j \neq i} \left(b_L^{ji} - a_L^{ji} \right),$$

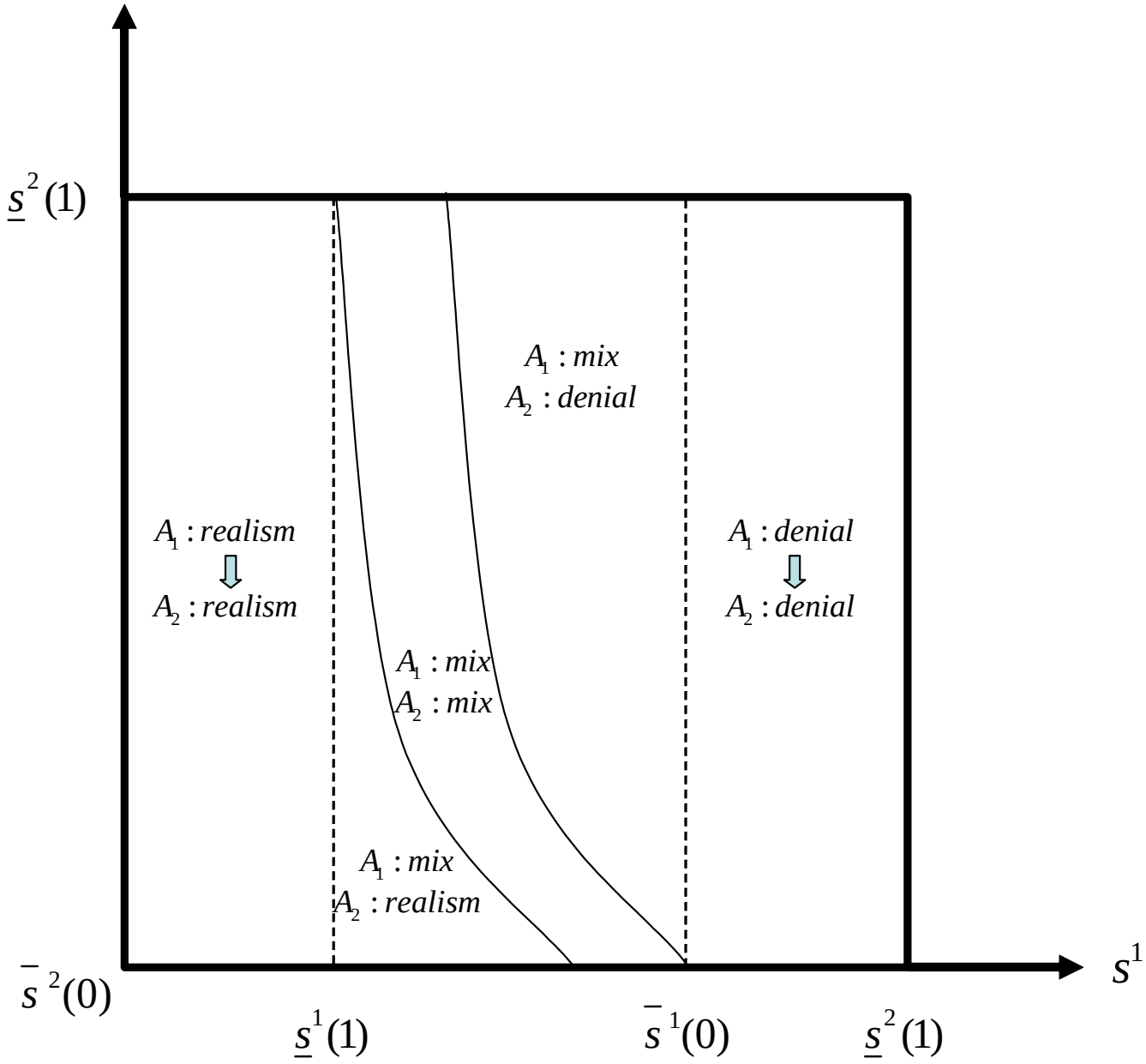
Hierarchies

- Dependency: agents i's realism, λ^i, influenced most by how key contributors to his welfare deal with L
- Simple hierarchy: agent 1 = manager, 2 = worker(s)
- Manager delusions hurt workers $>>$ the reverse:

  $b_L^{12} - a_L^{12}$, large, $b_L^{21} - a_L^{21}$ small $\Rightarrow$

  unique equilibrium, with...

Follow the leader



"Trickle down" of beliefs in a hierarchy

Welfare, dissent and free speech

- Are agents under collective illusion worse or better off than facing the truth?

  Group morale vs. groupthink

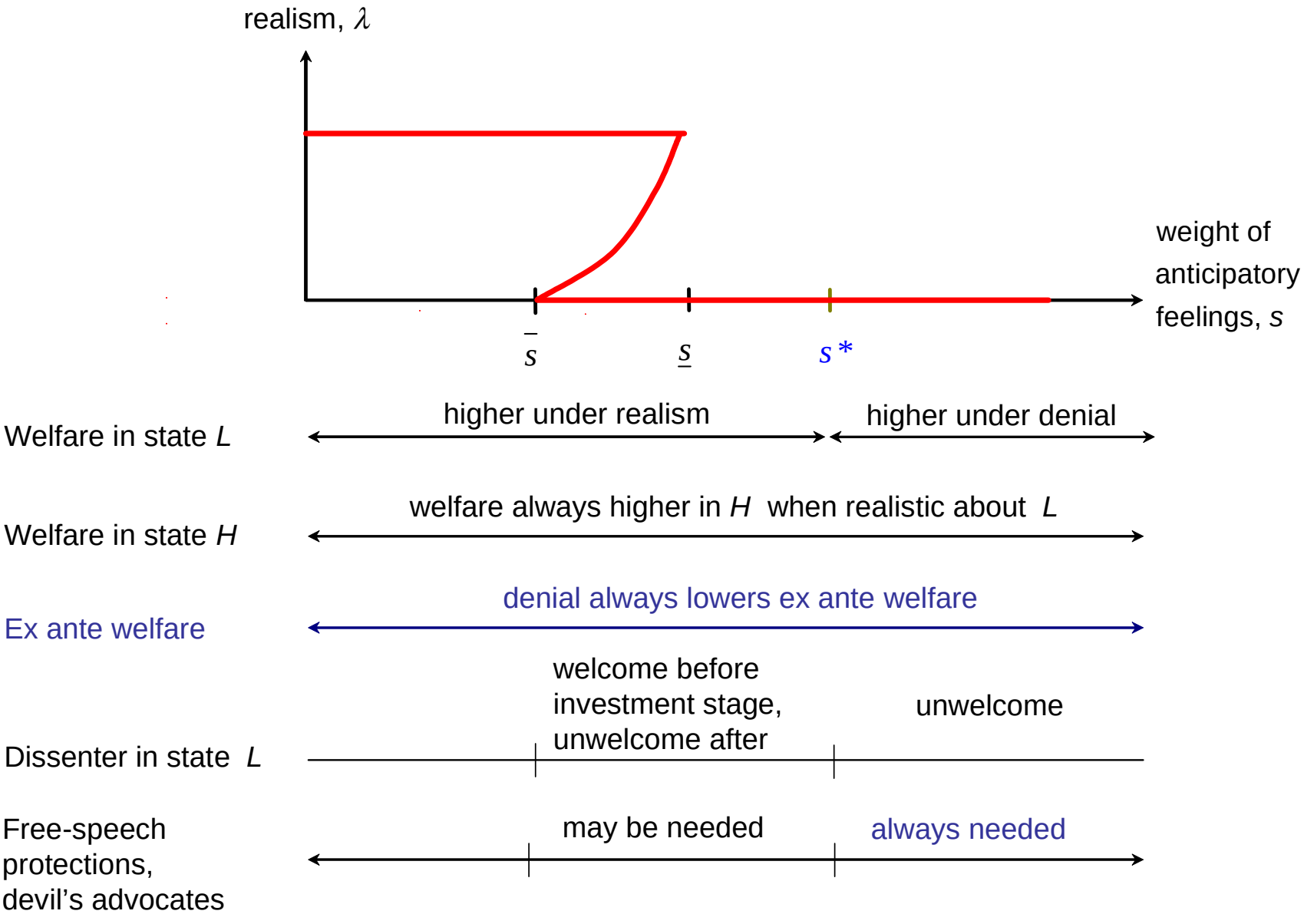
- Compare alternative equilibria, or outcomes achieved through collective commitment mechanism

- Consistent with revealed-preference approach

- Role and treatment of the bearers of bad news

  Same issues for small groups / firms and for societies / polities

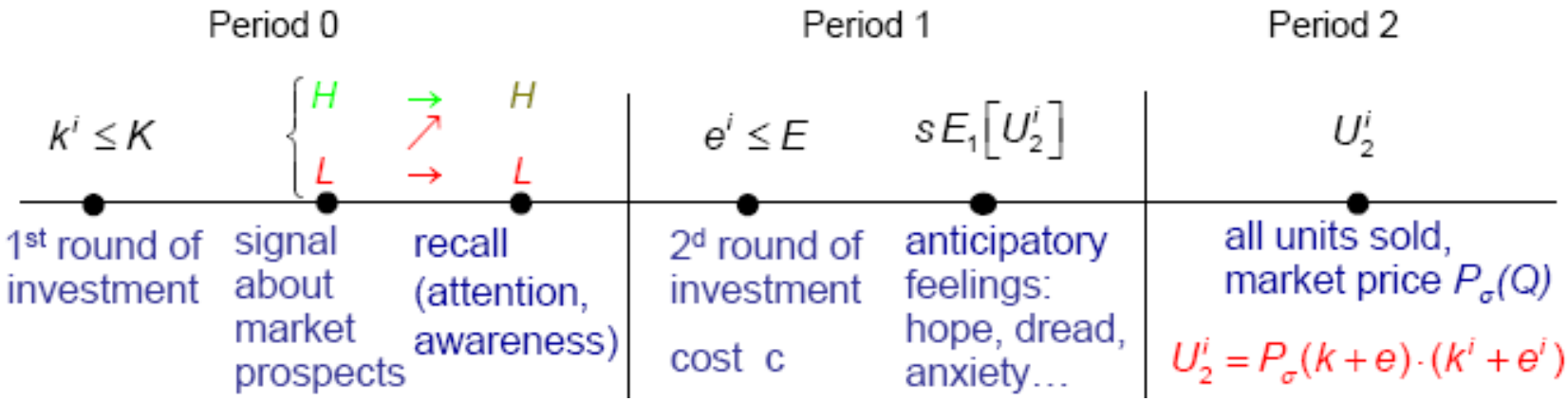
Social welfare and free speech (groupthink case)



Welfare: main results

- Mean belief invariant (Bayes) $\Rightarrow$ net welfare impact of wishful thinking is $\Delta W = (1-q)\left[(\delta+s)\,\theta_L - c - m/\delta\right]$
- *Group morale:* $\Delta W > 0$. Effort socially optimal even in low state L, but not privately optimal. If all could ignore bad news, better off both *ex ante* and *ex post* (in state L)
  - Virtues of optimism in principal-agent or team models
- *Groupthink:* $\Delta W < 0$. Novel case: collective illusions may greatly damage welfare in state L, but be unavoidable. Even when they improve social welfare in state L, those gains are always dominated by the losses induced in state H
- *Curse of Cassandra:* strong tension between *ex-ante* and *ex-post* incentives to tolerate dissent.
  - Need for institutions to foster and protect speech

"Irrational exuberance" in markets



- Continuum of firms, investors. Can produce or invest $k^i \le K$ at $t = 0$ with cost 0, and additional $e^i \le E$ at $t = 1$ cost c
- All units are sold at $t = 2$. Time to build, limited liquidity, no short sales ($\sim$ limits to arbitrage),
- Market price $P_\sigma(\bar{k} + \bar{e})$, reflects
  - total supply: $\bar{k} + \bar{e} \in [0, K + E]$
  - variable market conditions: $\sigma = H, L$
- Unchanged information structure, preferences

Illiquidity, missing prices

- Investment banks

	Lehman Brothers	Bear Stearns	
Level 1	96 (35.6%)	39 (17.7%)	Trade in active markets with readily available prices
Level 2	152 (56.3%)	163 (74.1%)	"Mark to model"
Level 3	22 (8.2%)	18 (8.2%)	"Reflect management's best estimates of what market participants would use in pricing the assets"
Total ($ billions)	270	220	

- Credit Default Swaps (CDS); worldwide, about $50 trillion.
  - Yet no established, centralized marketplace where could easily be traded and priced. Highly illiquid.

- Ex-ante, market sufficiently profitable that everyone invests $k^j = K$ at $t = 0$ (could also be predetermined stock).

- Look at agent i in $t = 1$ subgame, following initial investment k^i and market signal L

- Assume

$$P_L(K) < \frac{c}{s+\delta} < \frac{c}{\delta} < qP_H(K+E) + (1-q)P_L(K+E).$$

  Conditional on aggregate investment $\bar{k} = K$ at $t = 0$, it is dominant strategy for investor at $t = 1$ to:

  - invest if posterior is q or above
  - not invest if knows for sure that state is L

♦ Contagious exuberance

- Does other market participants' exuberance (denial of bad news) make each individual more or less likely to also be exuberant?/
- General obliviousness to weak fundamentals will further depress the (expected) final price: $P_L(K+E) << P_L(K)$

  Glut, market crash $\Rightarrow$ two effects:

  - Substitutability: if i remains bullish, will lose even more money on the extra E units which will produce / invest at $t=1$,

    $$[c - P_L(K+E)]\,E \quad \text{v.s.} \quad [c - P_L(K)]\,E$$

  - MAD: if bearish, even greater capital losses to be immediately acknowledged on outstanding position k^i

    $$[P_H(K+E) - P_L(K+E)]\,k^i \quad \text{vs.} \quad [P_H(K+E) - P_L(K)]\,k^i$$

With appropriate conditions:

- Escalating commitment / sunk cost effects: the more agent i has invested to date (k^i), the more likely he is to continue "blindly" / the less likely to be a realist
- Market momentum: the greater was *aggregate* prior investment (K), the more likely each agent is to continue investing "blindly"
- Contagious beliefs:

Proposition

If prior q is high enough and $P_H(K+E)(1+E/K) < c/\delta$,

1. *There is a range of s in which both realism and blind "exuberance" in the face of adverse news are equilibria.*
2. *Market mania leads to overinvestment and eventual crash.*

Other sunk assets facilitating blindness to red flags

- Human capital, specific to firm or sector
  (bankers, fund managers)
- Reputational capital
  (regulators, politicians)
- Intellectual capital: vested in efficient-markets view
  (economists)

♦ Five main results

1. MAD principle: denial is contagious when it is socially harmful.
2. Collective realism and collective wishful thinking as equilibrium cultures in firms, organizations. Group morale vs. groupthink.
3. Beliefs trickle down the hierarchy.
4. Cassandra's curse: ex ante vs. ex post treatment of dissenting speech, implying need for "constitutional" guarantees.
5. Market manias and crashes. Explicit, micro-founded model of contagious wishful thinking about prices, fundamentals.