

Deep Capture by Innovating Firms: A Modeling Framework and Policy Considerations

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Shallow and Deep Capture

Shallow Capture (Orthodox Regulatory Capture)

- Stigler (1971), Peltzman (1976), Laffont and Tirole (1993), Che (1995), Bo (2006)
- Transfer from a regulated firm to regulator enforcing government policy to influence regulator action
 - Contemporaneous (bribe) or delayed (revolving door) transfers commonly discussed

Deep Capture

- Hanson and Yosifon (2003), Smith and and Tasnádi (2014)
- Firm efforts to influence (nudge) institutions beyond the regulator
 - Media, public education, academic research, and scientific bodies in order to ultimately influence regulatory approval and public acceptance of firm's products and ideas

Motivation.....

- Innovation yields...
 - Potential benefits via improved products
 - Potential risks from novel aspects of these products
 - Asymmetry in...
 - Information about product improvements
 - Knowledge about how to assess novel aspects
 - Regulators must rely upon innovator to understand and evaluate novel aspects
 - Innovator has incentives to shape evaluation process to his benefit
- We argue that there exist economies of scope between
 - Innovation and regulatory influence via deep capture
 - Greater innovation effort reduces the cost of deep capture
 - The firm is in a stronger position to influence the regulator's evaluation mechanisms because the asymmetry of knowledge about the innovation and its novel aspects is heightened
 - The greater the novelty, the more the regulator must rely upon the innovator's knowledge to assess product risks, and the easier it becomes to shape assessment to the benefit of the firm

Possible Areas of Innovation

- Genetically modified crops
- Novel food ingredients
- Nanotechnology
- Drugs and Medical devices
- Financial/Risk management
- IT/communications

Examples of Deep Capture and Economies of Scope

- **“Without outside help ...the safety bureau [Ocean Energy Safety Institute – a regulatory body]...cannot realistically be expected to match industry in technical depth or breadth...”** This limits the agency in its role as a source of **“trustworthy, conflict-free insight and information...”** (October 2013, *Fuel Fix*, summarizing a National Academy of Sciences report)
- **“...P&G needed to develop different ...methods for evaluating safety, and the FDA needed to establish new regulatory standards for a product that could not be tested in routine ways.”** Nestle, *Food Politics*, on the introduction of *Olestra*, a fat substitute. Similar statements were made by P&G CEO Ed Gartz in Congressional testimony.

Regulatory and Influence Structure

- Assume following structure:



Policymaker → Regulator → Advisory Board → (Dis)approval

- Policymaker sets rules for regulator who recruits advisory board of experts that screens info on product quality supplied by innovating firm
 - **Shallow capture** via bribes/revolving door (Stigler, 1971)
 - **Deep capture** – regulators and supporting institutions subject to other forms of firm manipulation (Hanson and Yosifon, 2003)

Firm invests in R&D (continuous)

Nature acts revealing q , the
 $P(\text{innovation is safe})$, to firm

Firm spends on deep capture
and shallow capture

Advisory board observes mix of prior
and manipulated firm data

Board votes for approval based on perception of safety (deep capture)
and payout structure (shallow capture + idiosyncratic factors)

Firm invests in R&D (continuous)

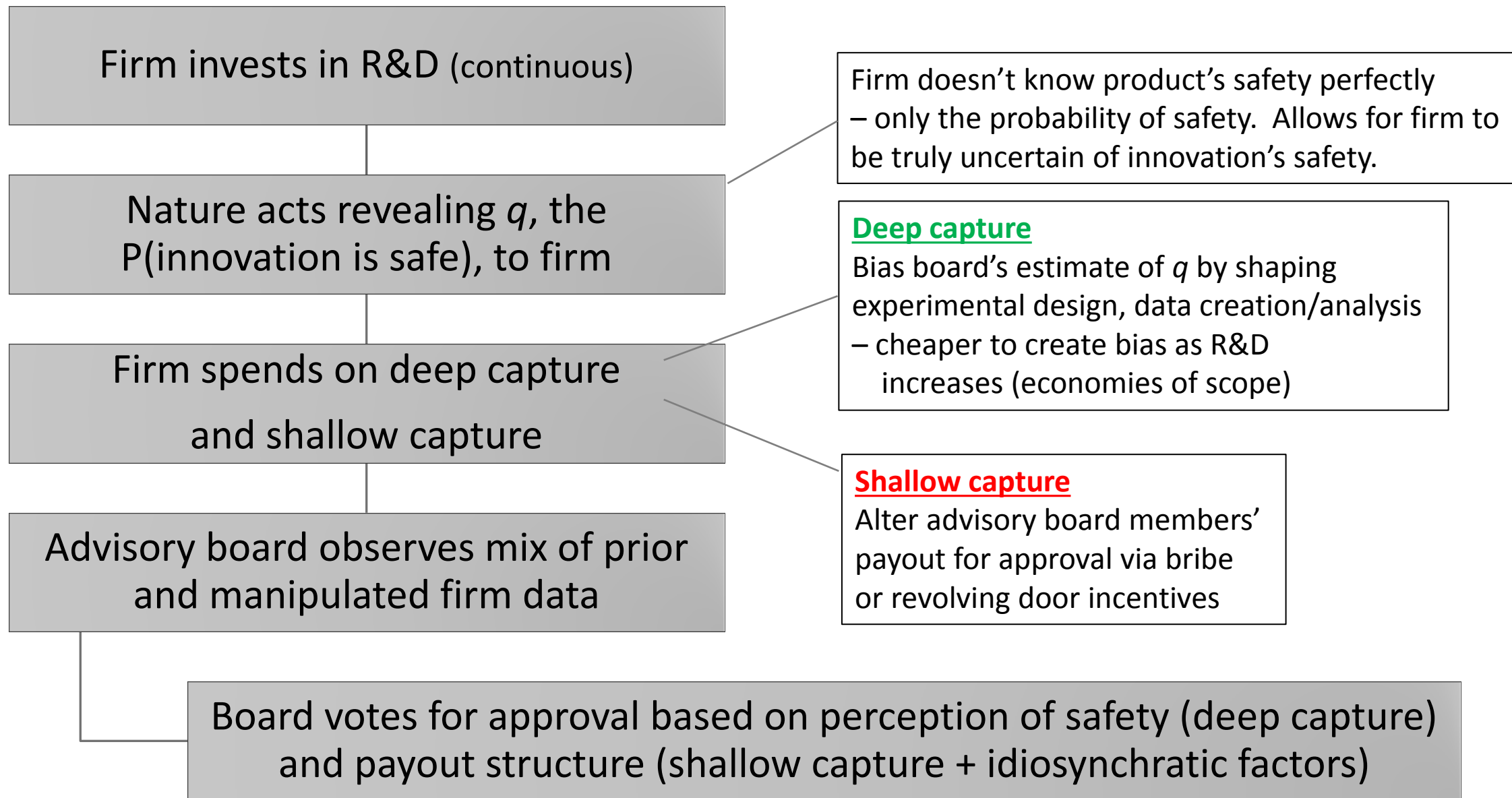
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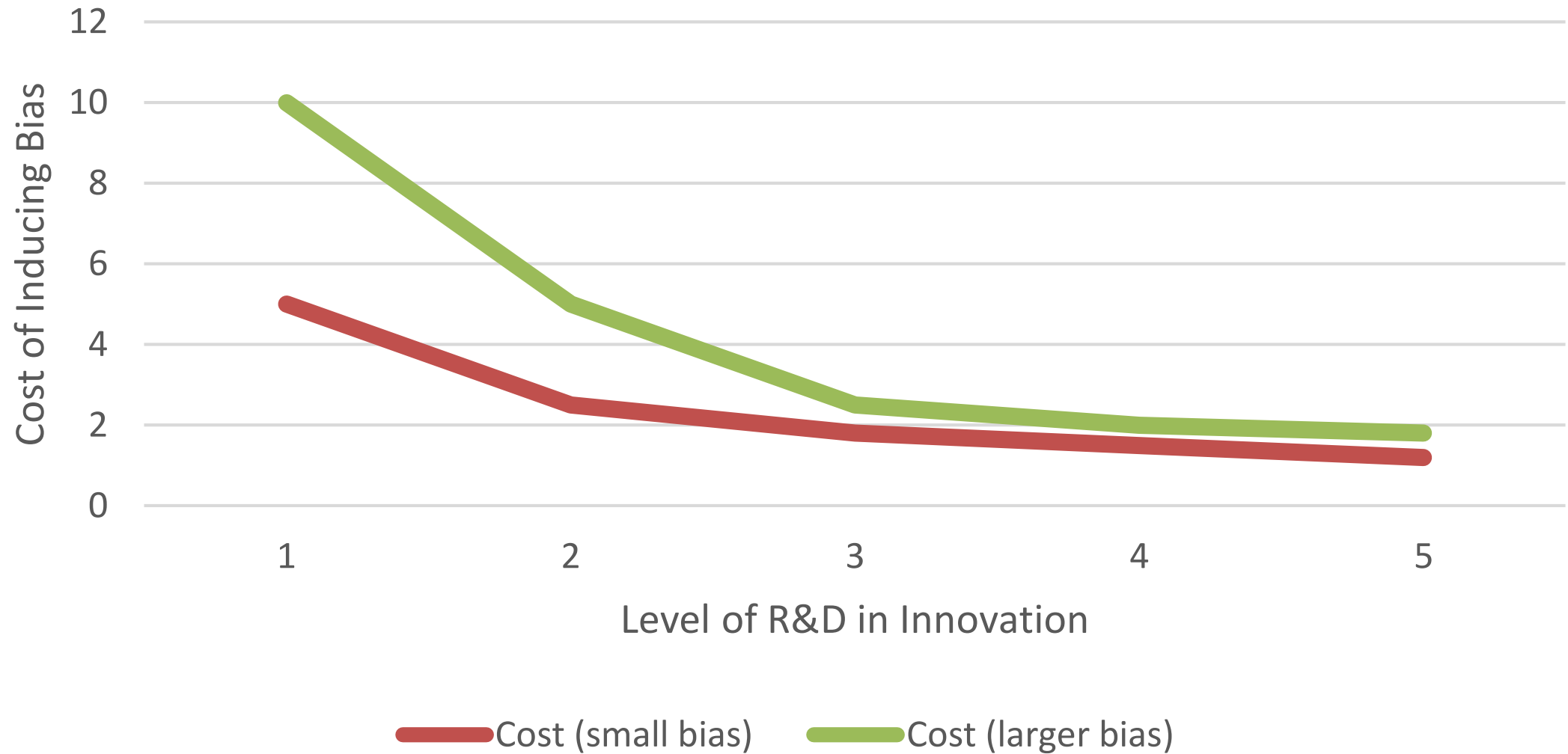
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Firm doesn't know product's safety perfectly
– only the probability of safety. Allows for firm to
be truly uncertain of innovation's safety.



Economies of Scope: Innovation and Deep Capture



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Deep capture
Bias board's estimate of q by shaping experimental design, data creation/analysis – cheaper to create bias as R&D increases (economies of scope)

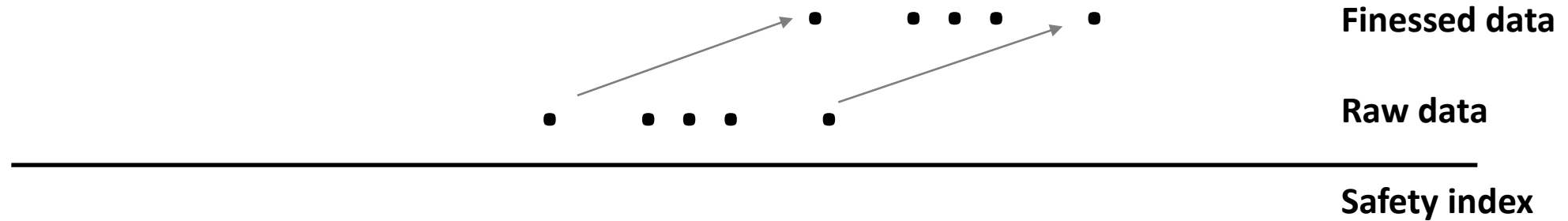
Shallow capture
Alter advisory board members' payout for approval via bribe or revolving door incentives

Board votes for approval based on perception of safety (deep capture) and payout structure (shallow capture + idiosyncratic factors)

DugGan and Martinelli (2001) model, applied by Iaryczower and Shum (2012) to Supreme Court Cases and by Camara and Kyle (2015) to FDA drug approvals

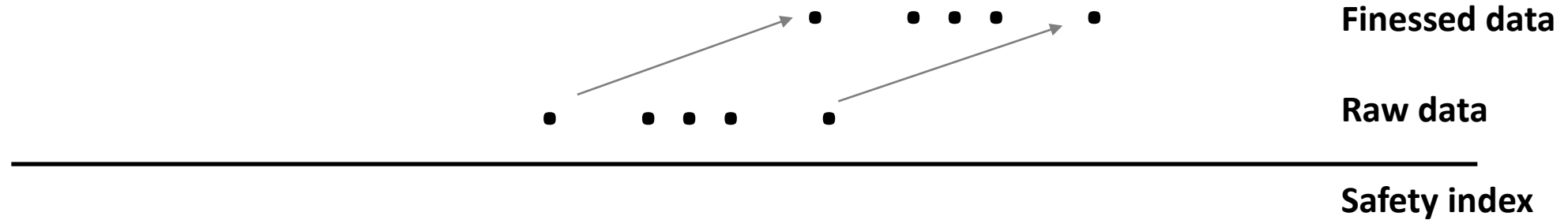
Firm Influence on Regulatory Assessment of Quality Samples

Biased analytical technique (data or measurement)

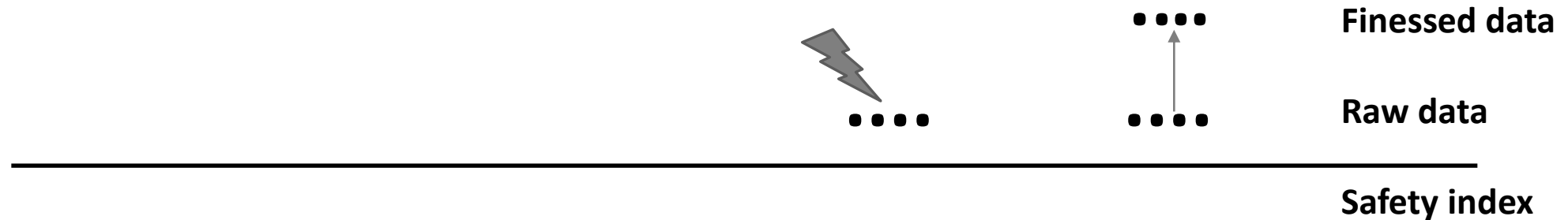


Firm Influence on Regulatory Assessment of Quality Samples

Biased analytical technique (data or measurement)



Outlier management



% of NIH funded scientists who admit to:

	All	Mid-Career
Falsified research data	0.3	0.2
Failure to present data that contradict own previous research	6.0	6.5
Overlooking others' use of flawed data or questionable interpretation of data	12.5	12.2
Changing design, methods or results of a study in response to pressure from funder	15.5	20.6

Source: Martinson, Anderson and de Vries (2005). "Scientists Behaving Badly," *Nature* 435(9 June): 737-738.

*Response rate to anonymous survey was 52% for mid-career scientists and 43% for early career scientists.

Policy Options

- 1. Advisory Board Composition and Functioning**
 - Increasing % that vote for approval
 - Increase data requirements (delay)
 - Increase monitoring for conflicts of interest/bribes/shallow capture
- 2. Allow for punitive damages**
 - Guessing game on understanding how seldom and how long before firms held liable
- 3. Increase publicly conducted innovation**
- 4. Investment in regulator knowledge/education**
- 5. Government-replicated studies (still subject to some deep capture issues)**
- 6. Curb innovation through higher approval processing fees or shorter patent protection**

Some Questions

Are deep and shallow capture substitutes or complements?

- With a limited budget and perhaps differential latitude to ‘reform’ internal (advisory boards) and external (research) institutions, regulators must decide how much and where to allocate such resources.
- As policies reduce shallow capture (e.g., conflict of interest disclosure or recusal rules), how will deep capture and R&D investment change?
- How do various voting rules (majority, supermajority, unanimity) affect relationship between deep and shallow capture efforts of firm? May depend upon prior disposition of board members (some may have affiliations with competitors or be unpersuadable due to prior sentiment)

Some Questions

Does the potential for deep capture induce socially excessive R&D expenditure due to economies of scope?

- What are the damages created and what is the distribution of damages?

How will policies that curb deep and shallow capture affect the firm-internal safety threshold below which firms will not submit innovations for approval (self-regulation of safety)?

- There likely exists an internal threshold q (probability that innovation is safe) below which firms will not seek approval (can only massage data so much or directly influence only so many board members).
- Can policies align the privately and publicly optimal thresholds and fully induce self regulation?
- Will beneficial innovation be stifled by policies that curb deep capture?