

Innovation diffusion as a  
coevolutionary process: adaptive  
emulation among firms and  
consultants

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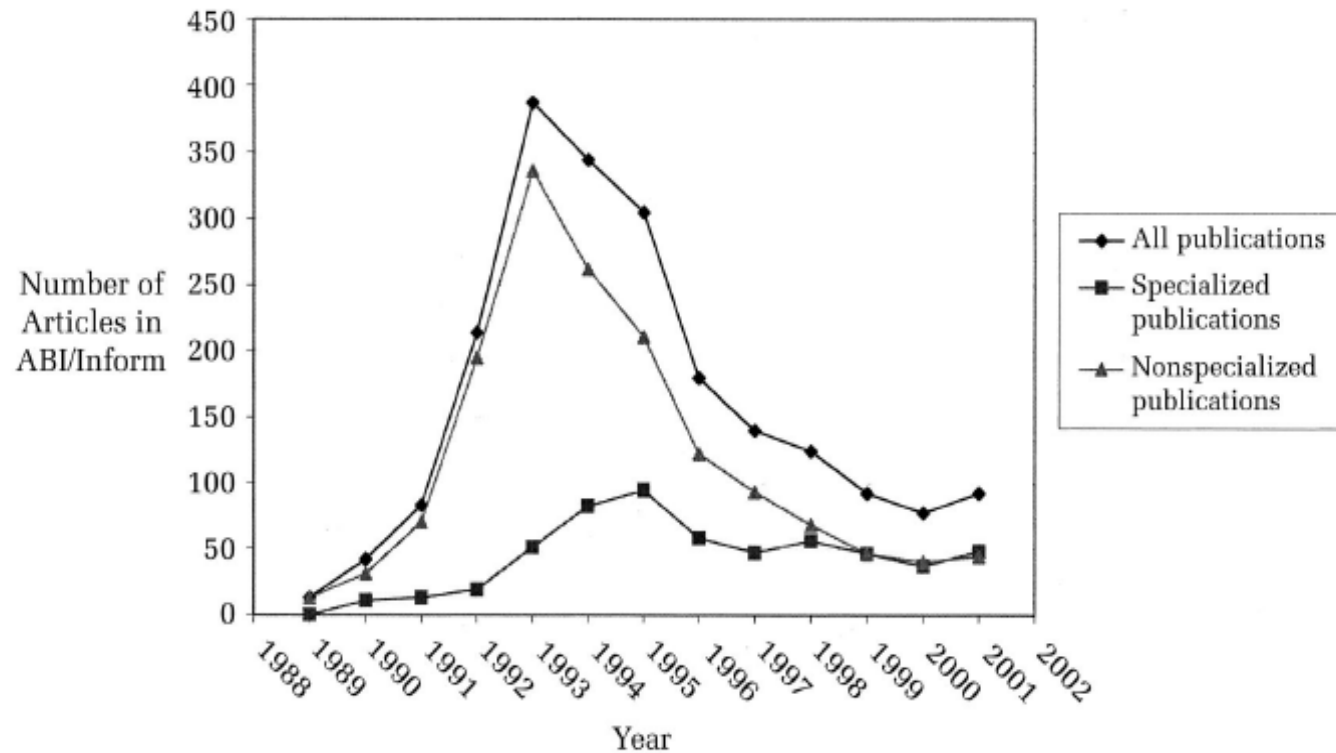
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# Faddish cycles in management

- Rapid rise and fall in the popularity of a management technique
- A transitory collective belief that a certain technique is at the forefront of rational management progress
- Explanations are offered by Barley and Kunda, Abrahamson, Strang and Macy, and others...

# TQM's discourse cycle

FIGURE 1  
TQM Discourse



# Adaptive Emulation (Strang and Macy 2001)

- Firms are seeded with an innovation
- In each period, they examine their performance (which may be affected by the innovation)
- If their performance is poor, the firm is likely to abandon its innovation and select a new one
- Abandoners either adopt the innovation of their most successful peer, or draw randomly from the pool of possible innovations

Key factor in adaptive emulation:  
innovation effectiveness  
(contra DiMaggio & Powell 1983)

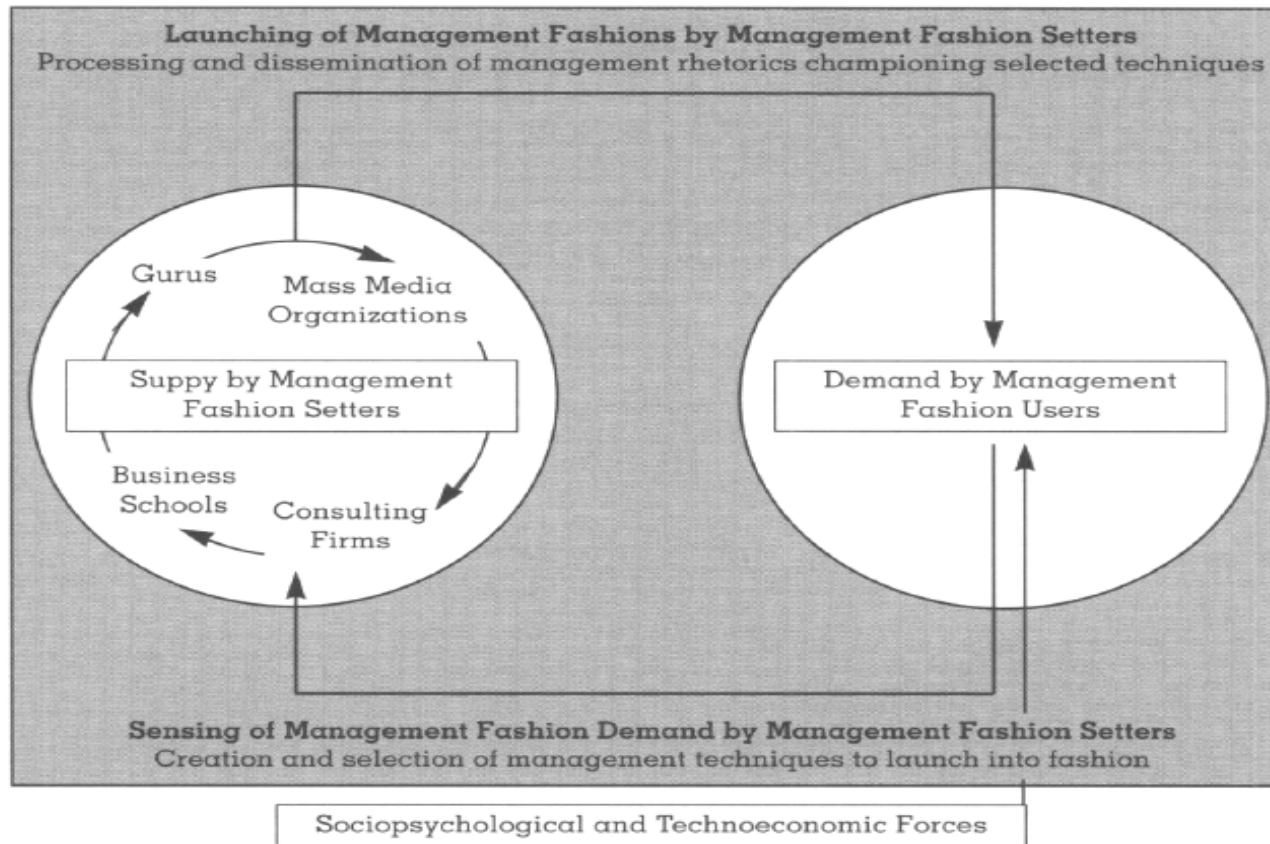
- When innovations are all worthless, no innovation becomes popular
- When innovations have a small impact on performance, faddish cycles arise
- When innovations have a large impact, one innovation becomes stably dominant

# What about management consultants?



# Abrahamson (1996): Fashion Setters

**FIGURE 4**  
**The Management-Fashion-Setting Process**  
Management Fashion Market



# Ernst & Kieser (2001): Demand for Consultants

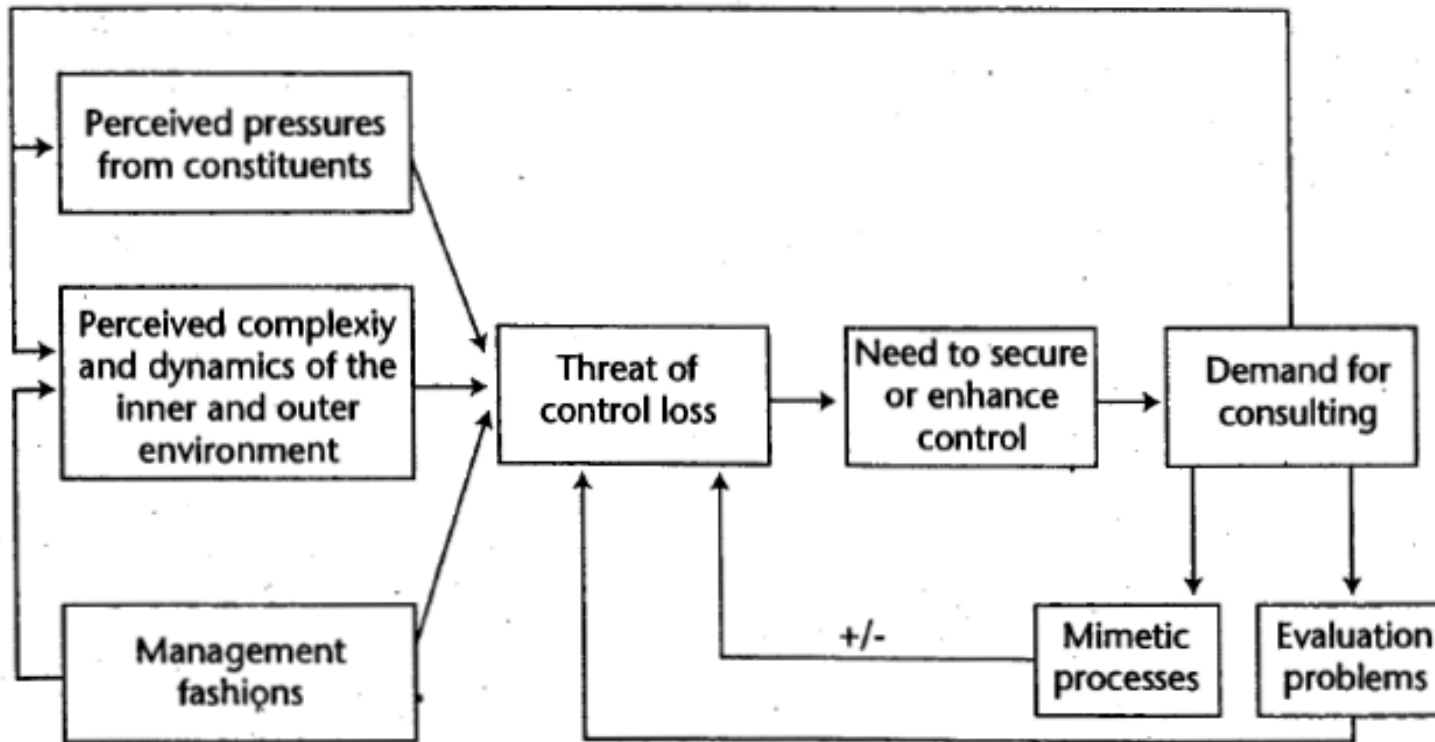


FIGURE 3.1 A model for the explanation of the consulting explosion



# David & Strang (2006): Coevolving Streams in Management Fashion

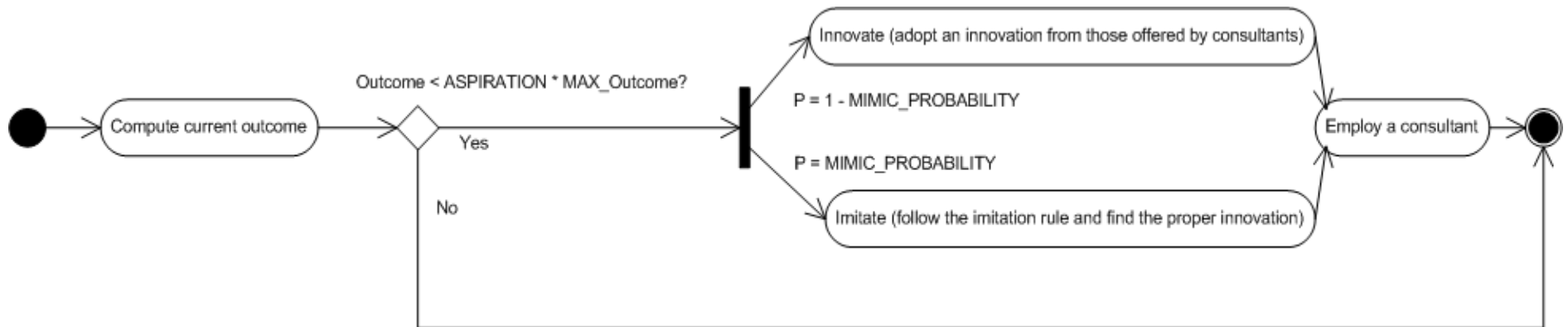
TABLE 5  
Coevolution of TQM Discourse, Adopters, and Consulting Firms

Period	Discourse	Organizational Adopters	Consulting Firms
Preboom, 1982–88	Little media attention Direct contacts within an incipient network of adopters and suppliers	Few adopters Prominent firms where technical fit is good Customized programs	Small consulting pool Quality specialists and gurus
Boom, 1989–93	High and rising volume of generalized discourse, aimed at general managers Loose usage with vague prescriptions Exaggerated claims and success stories	High levels of program adoption and usage Widely distributed across the business community Ceremonial and conforming programs	Large consulting pool Many generalists and firms lacking expertise
Bust, 1994–present	Low and falling volume of generalized discourse Continuing technical discussion within practitioner and academic community Attacks on excesses of the boom combined with focus on better implementation	Moderate levels of program adoption and usage Case study evidence of program maturation	Medium-sized consulting pool Specialists with quality expertise

# Adding consultants to adaptive emulation

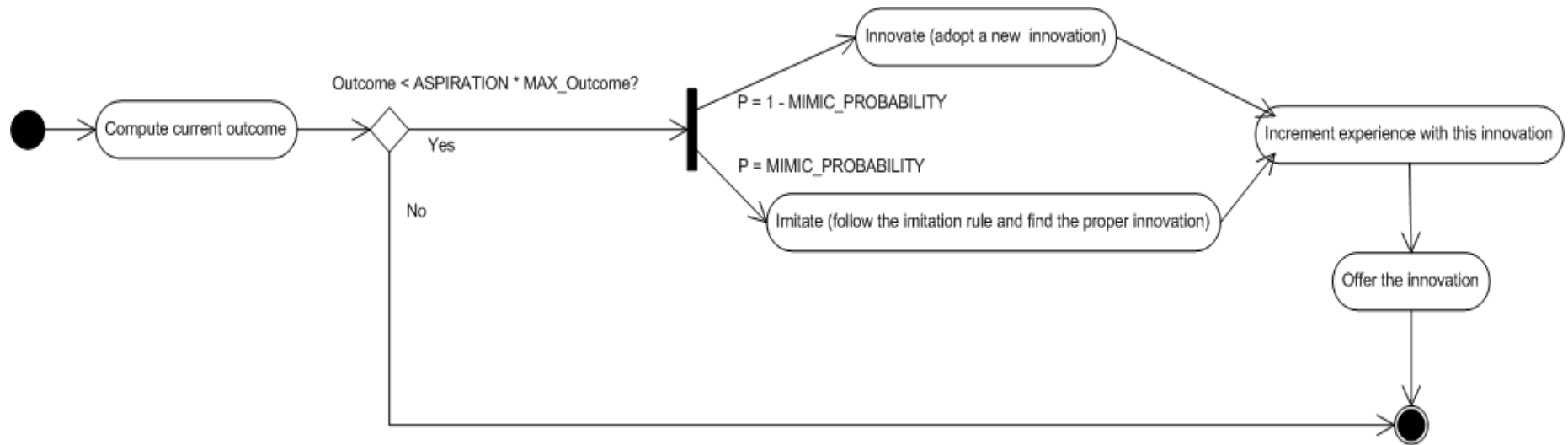
- Consultants can influence the diffusion of management techniques in two ways
  - As advertisers/persuaders
  - As program implementers
- Consultants also adopt & abandon management techniques, forming a dynamic supply side that interacts with firm-level demand

# Update a Firm



- At iteration  $i$ , each firm compares its outcome to ( $\text{ASPIRATION\_LEVEL} * \text{Outcome of the most successful firm}$ ), if the former is less than the latter:
  - With a probability equal to  $\text{MIMIC\_PROBABILITY}$ , it follows the imitation rule and adopts the proper innovation
  - Otherwise, it randomly picks an innovation from those offered by consultants
  - The firm finds and employ a consultant that offers this new innovation

# Update a Consultant



- At iteration  $i$ , each consultant compares its outcome to ( $ASPIRATION\_LEVEL * Outcome$  of the most successful consultant), if the former is less than the latter:
  - With a probability equal to  $MIMIC\_PROBABILITY$ , it follows the imitation rule and adopts the proper innovation
  - Otherwise, it picks an innovation randomly
- The consultant's experience with its innovation is incremented by a unit

# Firm Outcomes

$$O_{ft} = \alpha \cdot V_i^\beta \cdot Q_c^\gamma \cdot E_{cit}^\zeta + (1 - \alpha) \cdot \varepsilon_{ft}$$

- $O_{ft}$  : Outcome of firm f at time t
- $V_i$  : Performance value of innovation i
- $Q_c$  : Quality of consultant c
- $E_{ct}$  : Experience of consultant c with innovation i at time t
- $\varepsilon_{ft}$  : Luck (noise) for firm f at time t

# Consultant Outcomes

$$P_{ct} = \alpha \cdot \frac{\sum_{f \in F} z_{fct}}{|F|} + (1 - \alpha) \cdot \varepsilon_{ct}$$

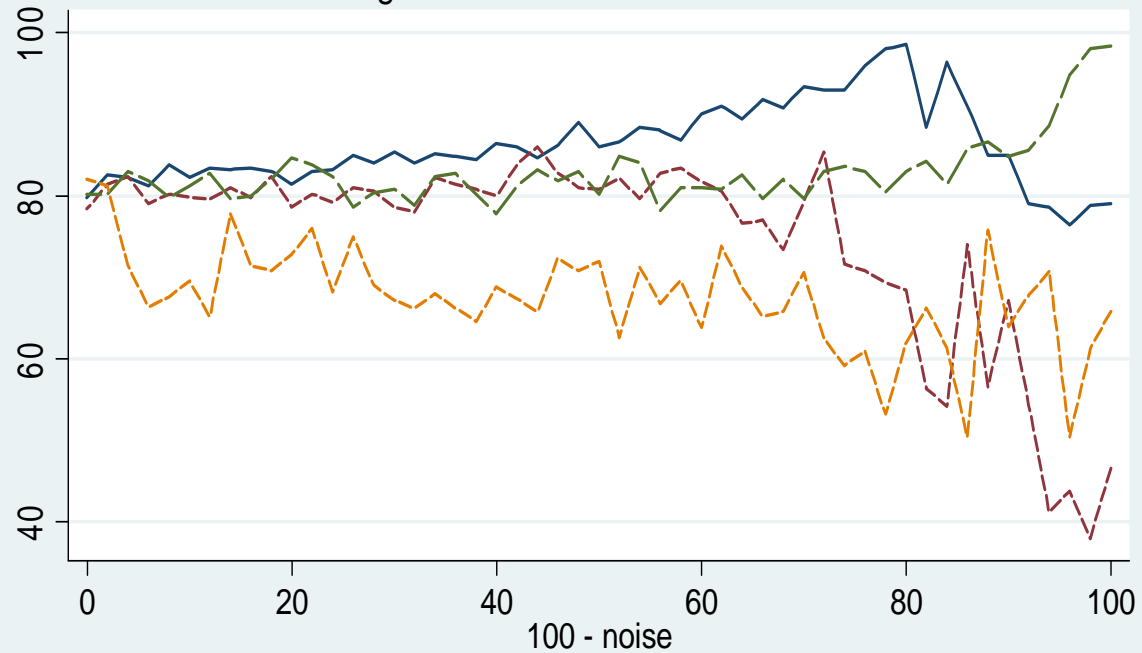
- $z_{ft} = \begin{cases} 1 & \text{If firm } f \text{ is working with consultant } c \text{ at time } t \\ 0 & \text{Otherwise} \end{cases}$
- $F$ : Set of all firms
- $|F|$ : Total number of firms (cardinality of  $F$ )
- $\varepsilon_{ct}$ : Luck (noise) for consultant  $c$  at time  $t$
- $\alpha, (1 - \alpha)$ : Relative weights of predictable factors and luck (noise)

# Alternative Imitation Rules

- Firm adopts ...
  - The innovation used by the most successful firm
  - The most popular innovation among firms
  - The most popular innovation among consultants
- Consultant adopts ...
  - The innovation used by the most successful consultant
  - The most popular innovation among firms
  - The most popular innovation among consultants

# Popularity of Leading Innovations

Average values for trials over noise 0..100

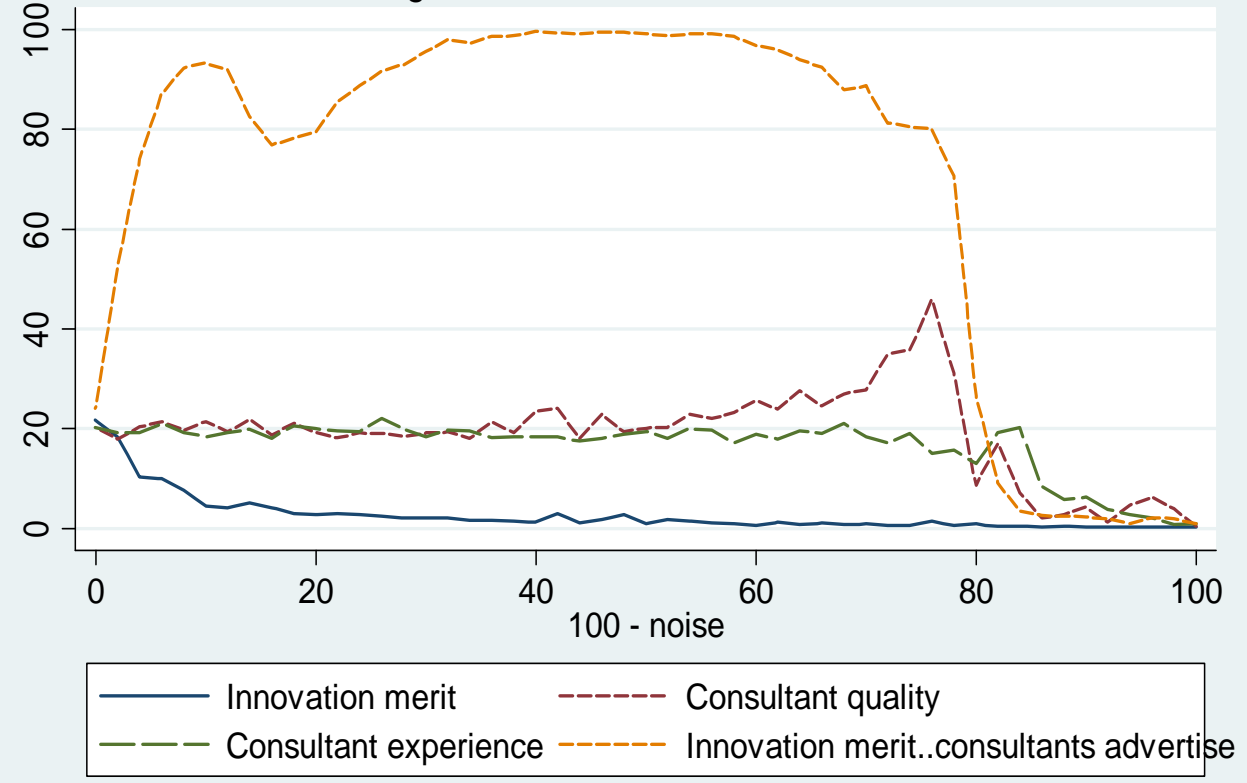


Firm aspiration = 80, Mimic = 80



# Turnover in Leading Innovations

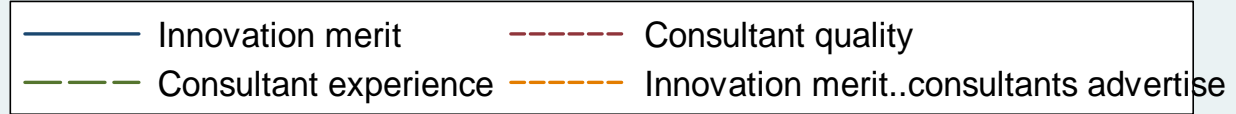
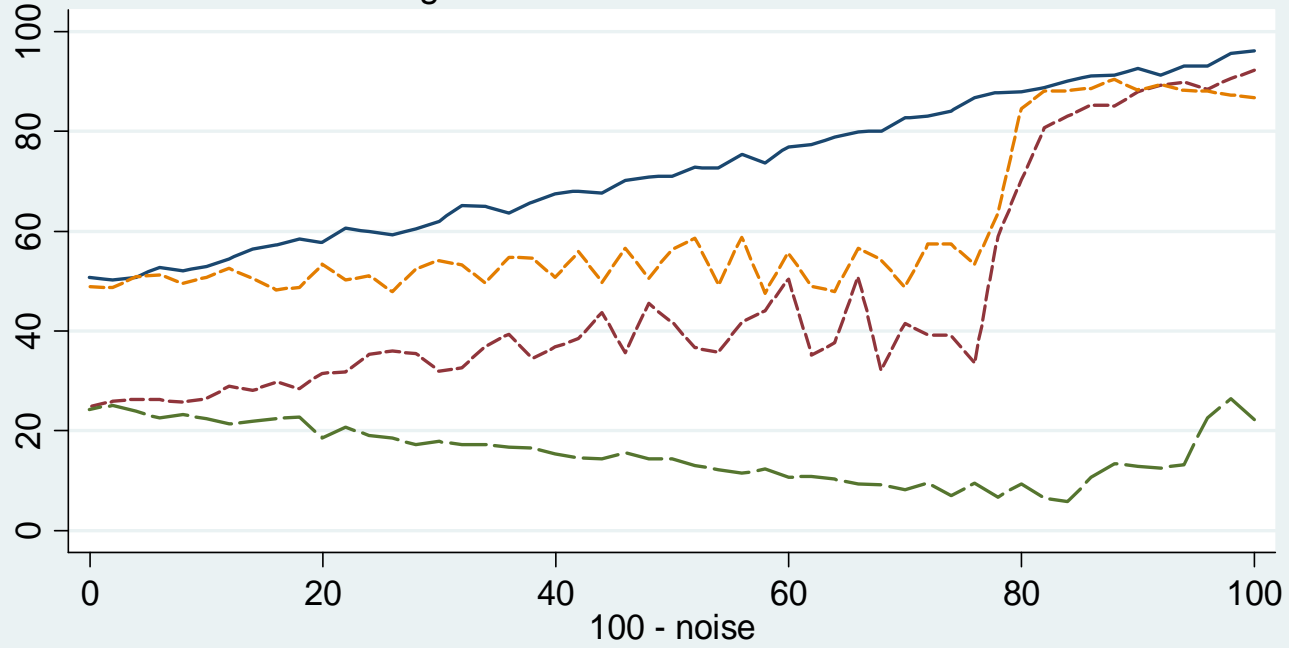
Average values for trials over noise 0..100



Firm aspiration = 80, Mimic = 80

# Performance

Average values for trials over noise 0..100



Firm aspiration = 80, Mimic = 80

# Some regularities (1)

- If effectiveness lies in consultants rather than innovations, previously stable worlds become faddish
  - Why? Unlike innovations, consultants form a moving target
  - Why? Unlike innovations, consultants require a learning curve

## Some regularities (2)

- Consultants are more volatile than firms
  - Why? They differentiate based on market share rather compete on efficiency
  - As a result, scenarios where consultants persuade firms to pursue innovations are more faddish than scenarios where they affect firms via implementation

# Next steps

- Tweak ... Functional form of abandonment decision, innovate/imitate decision, firm/consultant match, ??
- Modify ... Process by which consultants persuade firms to pursue new innovations, ??
- Learn from ... Full-fledged models of predator/prey interactions, ??