

Prediction markets:

A powerful tool for supply network management?

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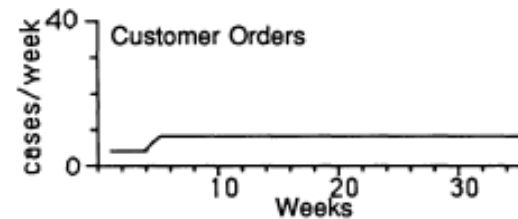
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PM & SNM > Introduction > Beer Distribution Game

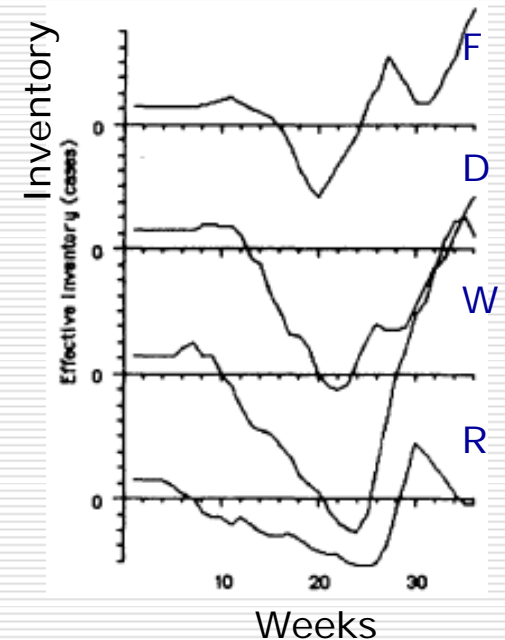
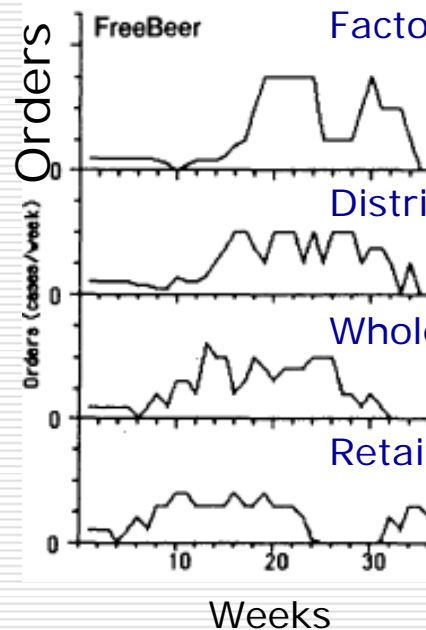


**Cause:
a single
shock**



Effects: Havoc!

- Patterns in management decisions
 - Oscillation
 - Amplification
 - Phase lag



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> Info impact on SC-performance

- Info sharing improves SC efficiency
- incentives for info sharing not always clear
- most studies concerned with dyadic or serial supply chains
 - not clear whether & how insights scale to more complex networks
- few studies deal with supply networks
- mostly simple forecasting methods

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> Motivating problem & ideas

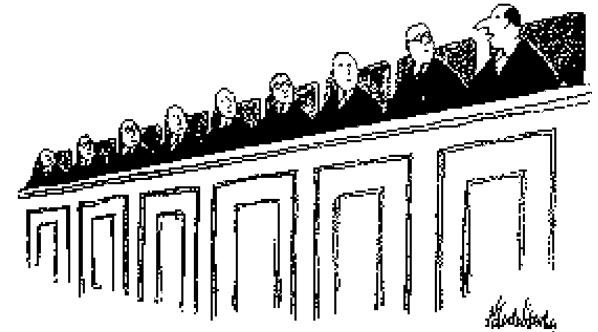
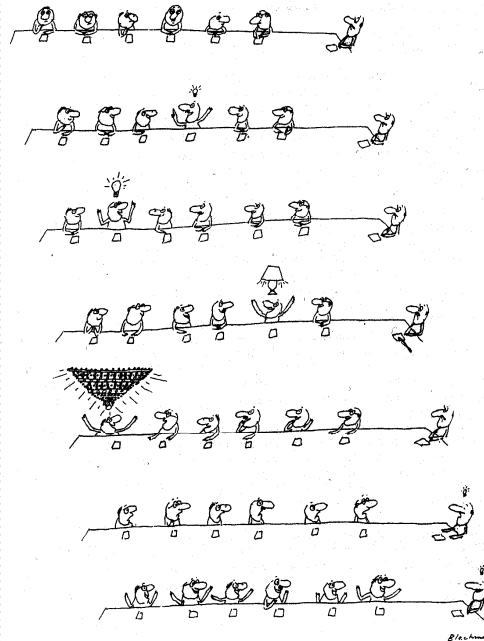
Motivating problem



"How do you want it — the crystal mumbo-jumbo or statistical probability?"

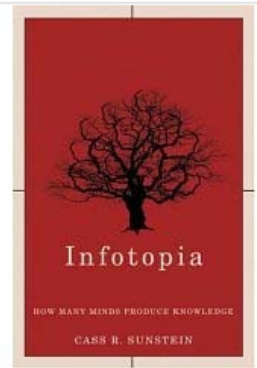
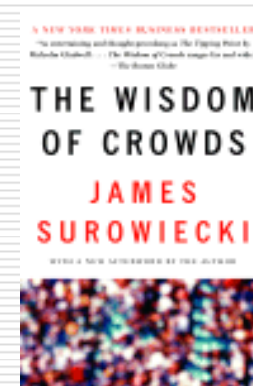


*Market
is a
mechanism
for
discovery*



"Well heck! If all you smart cookies agree, who am I to dissent?"
The New Yorker Magazine (c) 1972

Ideas



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> Definition & synonyms

□ Definition

- "Prediction markets are futures markets in which prices are used to predict future events." (Manski 2006)
- "... markets where participants trade contracts whose **payoffs are tied to a future event**, thereby yielding **prices that can be interpreted** as market aggregated **forecasts**." (Wolfers and Zitzewitz 2003)

□ Synonyms

- *information markets*
- *virtual stock markets*
- *ideas futures*
- *event futures*
- *political stock markets*
- *etc*

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> Application examples

- ❑ 1988 Iowa Electronic Market
- ❑ Hollywood Film Exchange
- ❑ Siemens, Hewlett-Packard, Google, Microsoft

- ❑ DARPA's FutureMAP and Policy Analysis Market (PAM) (shot down in 2003)

- ❑ ... and all bookies at the races

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> Principles

- ❑ Not all people are ignorant or foolish
- ❑ don't centralize info – aggregate it
- ❑ diverse and independent opinions
- ❑ Page's "Diversity Prediction Theorem:
Collective Error = Average Error – Predictive Diversity
- ❑ Crowd Beats the Average Law:
Collective Prediction Error < Average Individual Error
- ❑ Fools-Rush-Out condition:
*"People with highly **in**accurate predictive models answer poll questions but do not wager money in information markets"* (Page 2007)

PM & SNM > SWOT

> Strengths & Weaknesses

□ Strengths

- Wisdom of crowds effect
- low forecasting cost
- separation of entrepreneurial prediction from action
- transparent
- flexible

□ Weaknesses

- PM *"cannot make a silk purse out of a crowd of sow's ears"* (Page 2007)
- ill suited for small supply networks with few and homogenous agents
- neglect by business managers

PM & SNM > SWOT > Opportunities & Threats

- Opportunities: many but constrained by
 - number and diversity of agents in a SN
 - urgency of the prediction problem
 - presence of dominant agents

- Threats
 - anti-market ethic
 - market bubbles and madness of crowds
 - manipulations

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- Choice of forecasting issue
 - 0-1 event (policy, regulation, emergence of standard, ...)
 - sequence of events
 - absolute or relative number (demand, **price**, ...)
- Participation: open/**restricted**
- Incentives for participants
 - monetary or **non-monetary**
 - payoff function
 - fees or **free**
- Market maker
 - Cooperative – **independent**
 - commercial – **non-profit**
 - risk bearing ability
- Trading mechanism
 - **online**
 - various types of **auctions**

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> Time is up!

Thanks for listening!