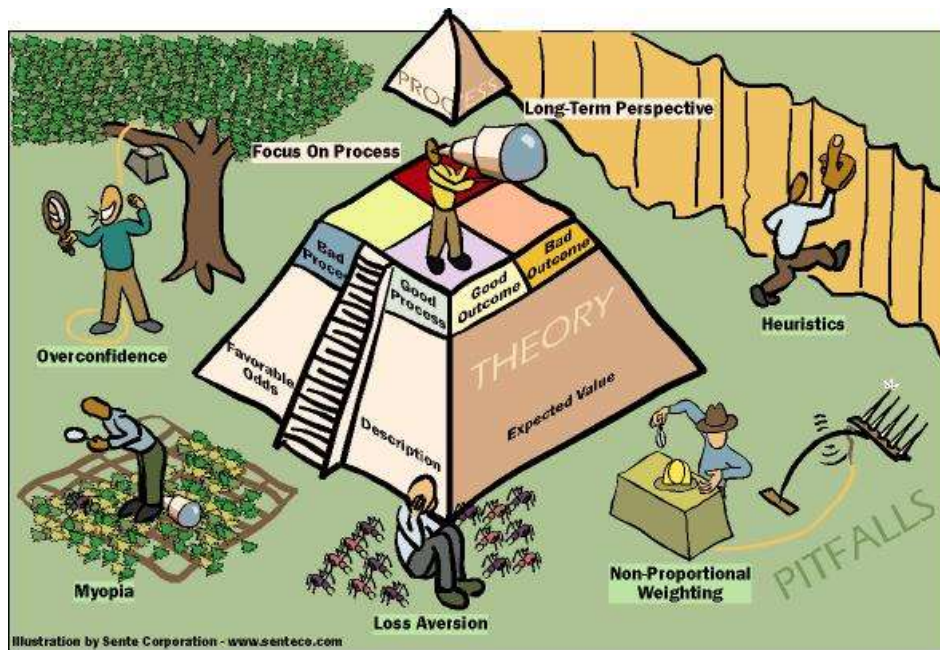




Educating Leaders for Business and Society
YALE SCHOOL OF MANAGEMENT

Professor Shyam Sunder
October 15, 2008

Decision Making for Investors

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Legg Mason Capital Management

Agenda

1. Practices of the best
 - ❖ Process versus outcome
 - ❖ Odds in your favor
 - ❖ Understanding the role of time
2. Expected value
 - ❖ Probabilities
 - ❖ Outcomes
3. Why we are suboptimal
 - ❖ Pitfalls and the results
 - ❖ How we can benefit

The “T” Theory

- ◆ The best in all probabilistic fields
 - ❖ Focus on process versus outcome
 - ❖ Always try to have the odds in their favor
 - ❖ Understand the role of time

- ◆ The best have more in common with one another than they do with the average participant in their field

Process Versus Outcome

- ◆ In any probabilistic situation, you must develop a disciplined and economic process
- ◆ You must recognize that even an excellent process will yield bad results some of the time
- ◆ The investment community—largely reflecting incentives—now seems too focused on outcomes and not enough on process

Process Versus Outcome

		Outcome	
		<i>Good</i>	<i>Bad</i>
Process Used to Make the Decision	<i>Good</i>	Deserved Success	Bad Break
	<i>Bad</i>	Dumb Luck	Poetic Justice

Try not to confuse outcomes and process

Source: J. Edward Russo and Paul J.H. Schoemaker, *Winning Decisions* (New York: Doubleday, 2002), 5.

Process Versus Outcome

Any time you make a bet with the *best of it*, where the odds are in your favor, you have earned something on that bet, whether you actually win or lose the bet. By the same token, when you make a bet with the *worst of it*, where the odds are not in your favor, you have lost something, whether you actually win or lose the bet.

David Sklansky, *The Theory of Poker*, 4th ed.
(Henderson, NV: Two Plus Two Publishing, 1999), 10.



www.expertpokeradvice.com

Process Versus Outcome



<http://www.treasury.gov/press/releases/images/pr4262ls.jpg>

Any individual decisions can be badly thought through, and yet be successful, or exceedingly well thought through, but be unsuccessful, because the recognized possibility of failure in fact occurs. But over time, more thoughtful decision-making will lead to better overall results, and *more thoughtful decision-making can be encouraged by evaluating decisions on how well they were made rather than on outcome.*

Robert Rubin,
Harvard Commencement Address, 2001.

Odds In Your Favor

- ◆ Asset prices reflect a set of expectations
- ◆ Investors must understand those expectations
- ◆ Expectations are analogous to the odds—and the goal of the process is finding mispricings
- ◆ Perhaps the single greatest error in the investment business is a failure to distinguish between knowledge of a company's fundamentals and the expectations implied by the price

Odds In Your Favor

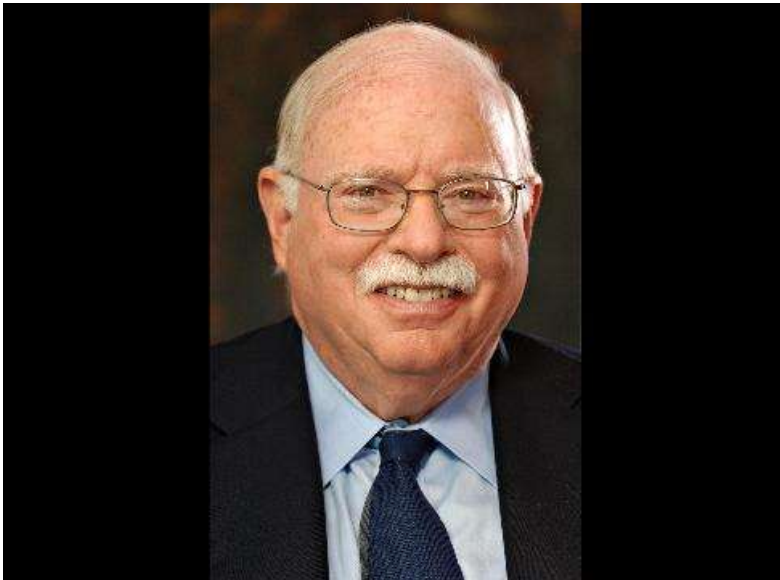
The issue is not which horse in the race is the most likely winner, but which horse or horses are offering odds that exceed their actual chances of victory . . . This may sound elementary, and many players may think that they are following this principle, but few actually do. *Under this mindset, everything but the odds fades from view. There is no such thing as “liking” a horse to win a race, only an attractive discrepancy between his chances and his price.*

Steven Crist, “Crist on Value,” in Beyer, et al., *Bet with the Best* (New York: Daily Racing Form Press, 2001), 64.



<http://www.thoughtleaderforum.com>

Odds In Your Favor



I defined variant perception as holding a well-founded view that was meaningfully different from the market consensus . . . *Understanding market expectation was at least as important as, and often different from, the fundamental knowledge.*

Michael Steinhardt, *No Bull: My Life in and Out of Markets*
(New York: John Wiley & Sons, 2001), 129.

<http://www.bloomberg.com/apps/news?pid=20601093&refer=home&sid=aXv9RI2Ful7w>

The Role Of Time

- ◆ Because investing is about probabilities, the short-term does not distinguish between good and poor processes
- ◆ A quality process has a long-term focus
- ◆ The investment community's short-term focus is costly, and undermines a quality long-term process

The Role Of Time

Over a long season the luck evens out, and skill shines through. But in a series of three out of five, or even four out of seven, anything can happen. In a five-game series, the worst team in baseball will beat the best about 15 percent of the time. Baseball science may still give a team a slight edge, but that edge is overwhelmed by chance.

Michael Lewis, *Moneyball: The Art of Winning an Unfair Game*
(New York: W.W. Norton & Company, 2003), 274.



<http://www.nytimes.com/2006/10/05/books/05masl.html>

The Role Of Time

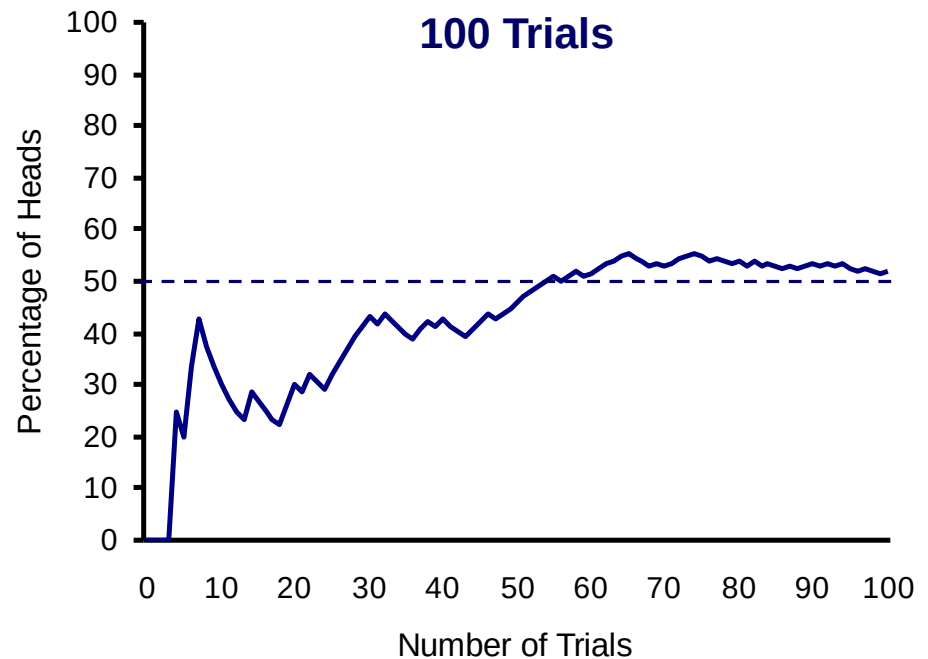
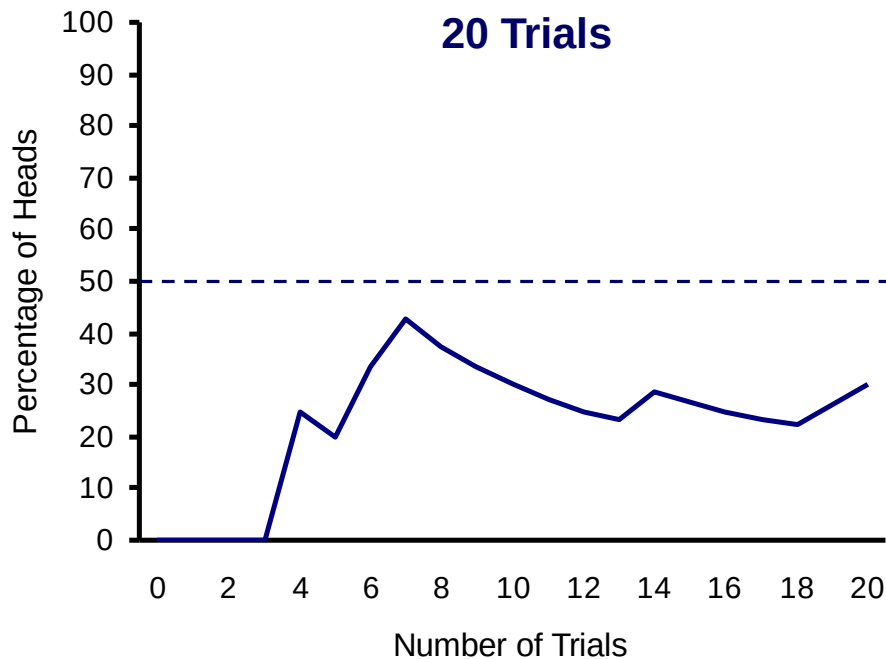


The result of one particular game doesn't mean a damn thing, and that's why one of my mantras has always been "Decisions, not results." *Do the right thing enough times and the results will take care of themselves in the long run.*

Amarillo Slim, *Amarillo Slim in a World of Fat People*
(New York: Harper Collins, 2003), 101.

The Role Of Time

Time arbitrage



Source: Michael J. Mauboussin, "Capital Ideas Revisited Part II," *Mauboussin on Strategy*, Legg Mason Capital Management, May 20, 2005.

From Theory To Practice

- ◆ Principles of expected value
 - ❖ How do you set probabilities?
 - ❖ How do you consider outcomes?

Expected Value

Expected value is the weighted average value for a distribution of possible outcomes

Take the probability of loss times the amount of possible loss from the probability of gain times the amount of possible gain. That is what we're trying to do. *It's imperfect, but that's what it's all about.*

Warren E. Buffett
Berkshire Hathaway Annual Meeting, 1989.



http://blogs.abcnews.com/theblotter/2006/06/lunch_with_warr.html

Expected Value

Risk versus uncertainty

Risk – we don't know the outcome, but we know what the underlying distribution looks like

- ❖ incorporates the element of loss/harm

Uncertainty – we don't know the outcome, and we *don't* know what the underlying distribution looks like

- ❖ need not incorporate loss/harm



Source: http://www.lib.utk.edu/outreach/about/hall_fame/knight.html

Source: Frank H. Knight, *Risk, Uncertainty, and Profit* (Boston: Houghton and Mifflin, 1921).

How To Think About Probabilities

Three ways to set probability

1. Degrees of belief

- ❖ Subjective probabilities
- ❖ Satisfy probability laws

2. Propensity

- ❖ Reflect properties of object or system
- ❖ Roll of a die: one-in-six probability

3. Frequencies

- ❖ Large sample of appropriate reference class
- ❖ Finance community largely in this camp

Source: Gerd Gigerenzer, *Calculated Risks* (New York: Simon & Schuster, 2002), 26-28.

How To Think About Probabilities



<http://www.hss.caltech.edu/~bcornell/RESEARCH.htm>

Beware of *nonstationarity*

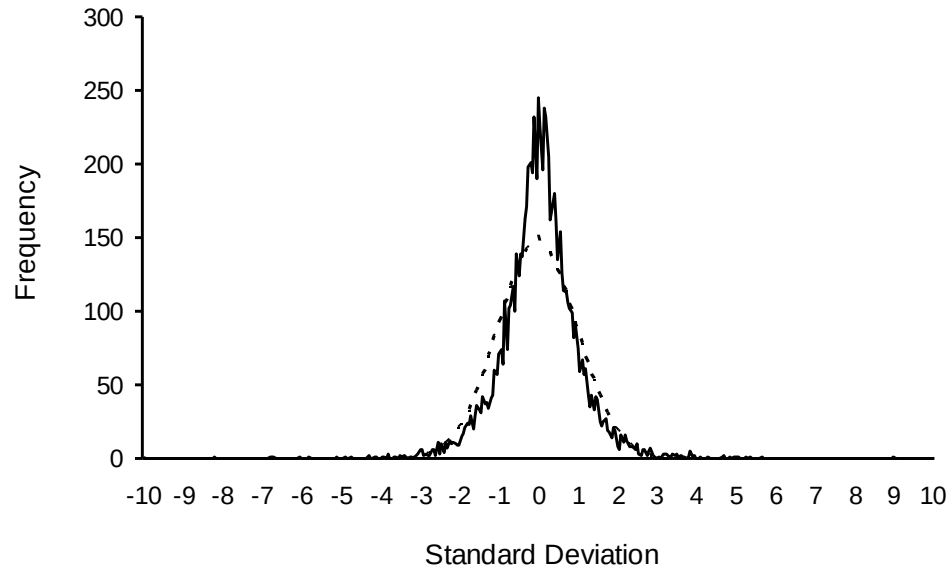
For past averages to be meaningful, the data being averaged must be drawn from the same population. If this is not the case—if the data come from populations that are different—the data are said to be nonstationary. *When data are nonstationary, projecting past averages typically produces nonsensical results.*

Bradford Cornell, *The Equity Risk Premium*
(New York: John Wiley & Sons, 1999), 45-46.

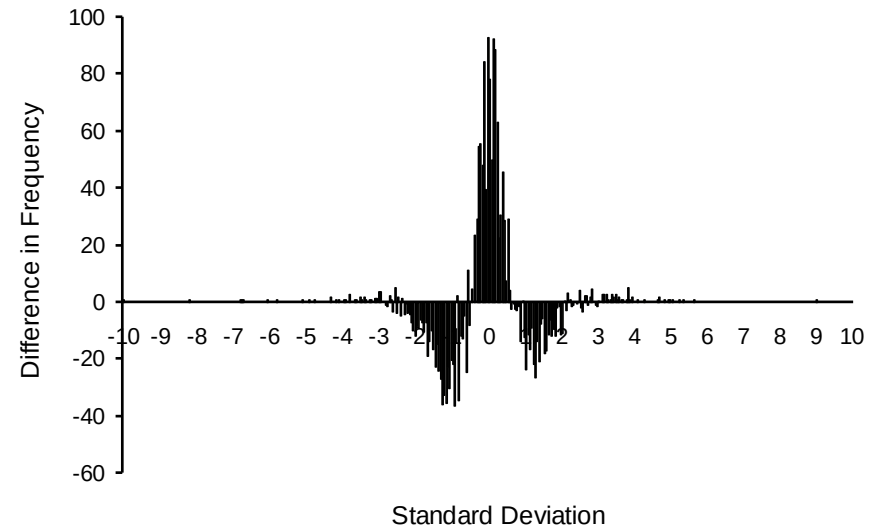
Multiples are probably nonstationary

How To Think About Outcomes

Frequency Distribution of S&P 500 Daily Returns
January 1978 – December 2007



Frequency Difference: Normal Versus Actual Daily Returns
January 1978 – December 2007



Source: FactSet.

Frequency Versus Magnitude

Frequency (probability) and
magnitude (outcome) both matter

Good probability, bad expected value

<u>Probability</u>	<u>Outcome</u>	<u>Weighted Value</u>
70%	+1 %	+0.7%
30%	-10	-3.0
<u>100%</u>		<u>-2.3%</u>

Bad probability, good expected value

<u>Probability</u>	<u>Outcome</u>	<u>Weighted Value</u>
70%	-1 %	-0.7%
30%	+10	+3.0
<u>100%</u>		<u>+2.3%</u>

Why We Are Suboptimal

Behavioral finance pitfall

Result

Overconfidence

Outcome range too narrow

Anchoring and adjustment

Anchor on past event or trend

Framing effect

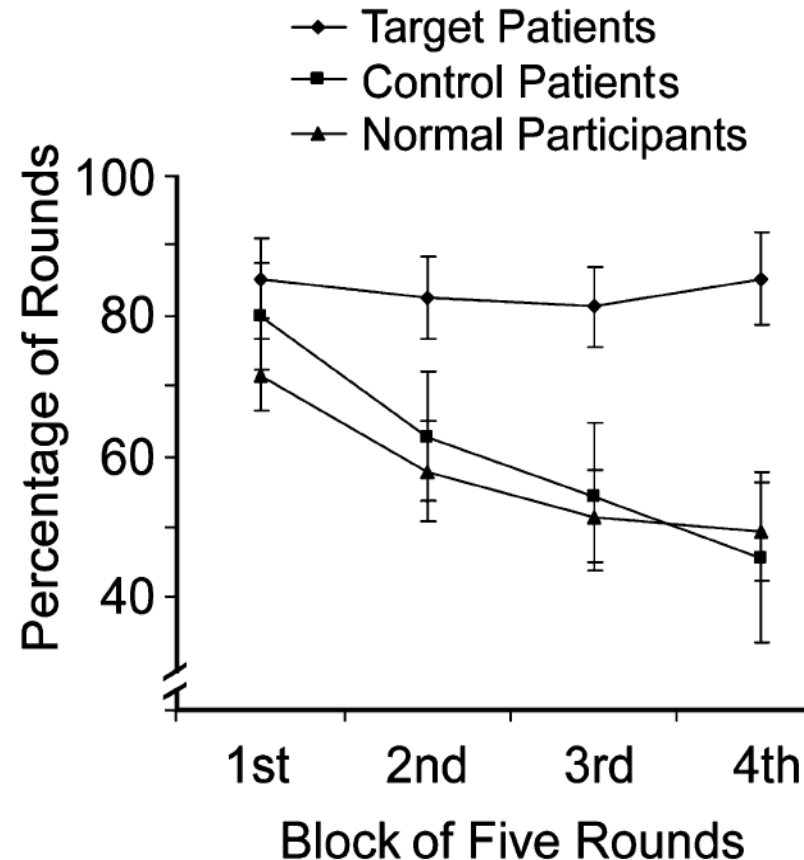
Sell winners and hold losers

Confirmation trap

Seek confirming information and dismiss or discount disconfirming information

The Power of the Situation

Brain-Damaged Patients



Source: Michael J. Mauboussin, "Aver and Aversion," *Mauboussin on Strategy*, Legg Mason Capital Management, August 9, 2005; Baba Shiv, George Loewenstein, Antoine Bechara, Hanna Damasio, and Antonio R. Damasio, "Investment Behavior and the Negative Side of Emotion," *Psychological Science*, Volume 16, Number 6, 435-439.

The Power of the Situation

The Lucifer Effect



The Power of the Situation

The Halo Effect

	<u>T-2</u>	<u>T+2</u>
Category 1	+42.7%	+4.2%
Category 5	-34.6%	+12.4%

FAJ Financial Analysts Journal
Volume 63 • Number 2
©2007, CFA Institute

Are Cover Stories Effective Contrarian Indicators?

Tom Arnold, CFA, John H. Earl, Jr., CFA, and David S. North

Headlines from featured stories in Business Week, Fortune, and Forbes were collected for a 20-year period to determine whether positive stories are associated with superior future performance and negative stories are associated with inferior future performance for the featured company. "Superior" and "inferior" were determined in comparison with an index or another company in the same industry and of the same size. Statistical testing implied that positive stories generally indicate the end of superior performance and negative news generally indicates the end of poor performance.

The covers of business magazines have been considered informative as a potential contrarian signal (e.g., Stalter 2005; Forsyth 1996, 1997; Queenan 1991). Aside from anecdotal evidence and a few factual examples, however, such a view has never been validated statistically. Others have studied specific business analysts or television programs (e.g., Desai and Jain 2004; Ferreira and Smith 2003), tested the effect of company fortunes statistically, and demonstrated a limited effect on future short-term stock prices (many times only on the first day after the information was reported). We statistically tested the effect of business magazine cover stories (as identified by the cover headlines) on stock prices/returns for more than a 1,000-day horizon (500 days prior to and 500 days after publication; we excluded the publication date from the analysis). We investigated effects of cover stories from *Business Week*, *Fortune*, and *Forbes* for a 20-year period (1983–2002).

To formalize how a magazine cover article might affect future returns, one can assume that the given story reports new pertinent information or simply reports past information. If the information is genuinely new, the market can exhibit the following reactions:

- an instantaneous and correct reaction—that is, a very short term effect occurs but no lingering future effects;
- an underreaction—a potentially longer-term effect occurs that makes the story a momentum indicator;
- an overreaction—a potentially longer-term effect occurs that makes the story a contrarian indicator.

If the information contained in the article is not new, the market can have the following reactions:

- no reaction—that is, all information incorporated in prices;
- a reaction that coincides with the popularity of the stock—that is, a possible momentum indicator;
- a reaction that coincides with the stock being mispriced—that is, a possible contrarian indicator.

Most of the anecdotal evidence supports the idea that cover stories are not informational because of the time needed to gather information for the article and to print it. The availability of instantaneous business news and, to a lesser extent, daily business news outlets put weekly and biweekly (every two weeks) news magazines at a great disadvantage in providing new information about a company. Furthermore, the anecdotal evidence tends to view the scenario in which the article coincides with a stock being mispriced as giving credence to the idea that the magazine cover story is a contrarian indicator (again, assuming no new information is revealed in the article).

We carried out tests to determine whether cover stories are indicators of future performance (momentum or contrarian). We did not consider whether or not the given article revealed new information about the company. Our bias, based on the disadvantages of weekly and biweekly business news magazines in reporting news in a timely manner, was toward the hypothesis that cover stories do *not* reveal new information about a company.

Cover Story Data and Analysis

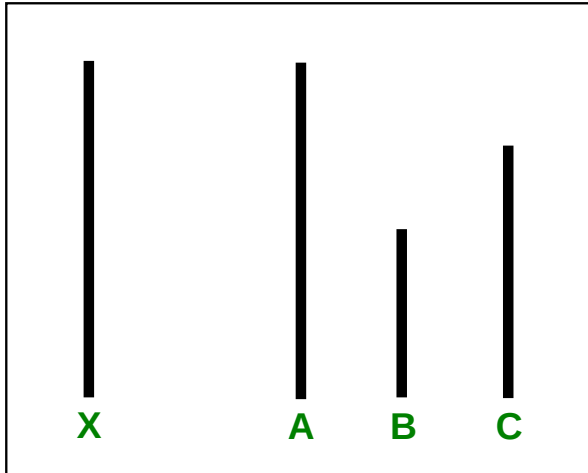
We analyzed companies that were the subject of feature (cover) stories in *Business Week* (weekly), *Fortune* (biweekly), and *Forbes* (biweekly) magazines between 1983 and 2002 for stock price performance 24 months prior to and 24 months after (i.e.,

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How Can We Benefit?

- ◆ Look for diversity breakdowns
 - ❖ We often make decisions by observing others
 - ❖ Imitation has a bad name in investing but is common in everyday life
 - ❖ Information cascades—a reasoned or arbitrary decision by one individual triggers action by many

Social Psychology



Source: LMCM.

Solomon Asch's study
of social conformity



Source: www.web.lemoyne.edu/~hevern/psy101_04F/psy101graphics/aschconform.jpg.

Social Psychology



Source: Sandra Blakeslee, "What Other People Say May Change What You See," *New York Times* Online, June 28, 2005.

Asch wondered...
is it a distortion of:

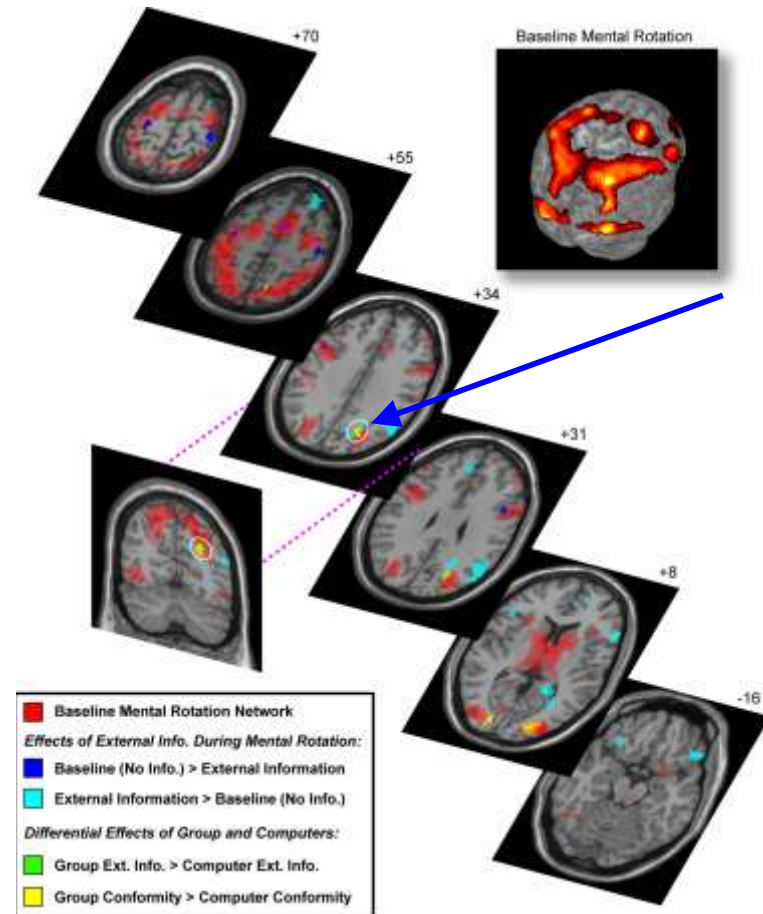
Judgment?

Action?

Perception?

Greg Berns

“We like to think that seeing is believing, but seeing is believing what the group tells you to believe.”



Source: Reprinted from *Biological Psychiatry*, Gregory S. Berns, Jonathan Chappelow, Caroline F. Zink, Giuseppe Pagnoni, Megan Martin-Skurski, and Jim Richards, “Neurobiological Correlates of Social Conformity and Independence During Mental Rotation,” June 22, 2005, with permission from Society of Biological Psychiatry.

Takeaways

- ◆ Investing is a probabilistic exercise
- ◆ Expected value is the proper way to think about stocks
- ◆ There are many pitfalls in objectively assessing probabilities and outcomes
- ◆ We need to practice mental discipline or else we'll lose long-term to someone who is practicing that discipline
- ◆ Markets periodically go to excesses

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