

Slow and steady
wins the race.



Applications of Behavioral Finance

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Ben Graham and Warren Buffett on “Mr. Market”

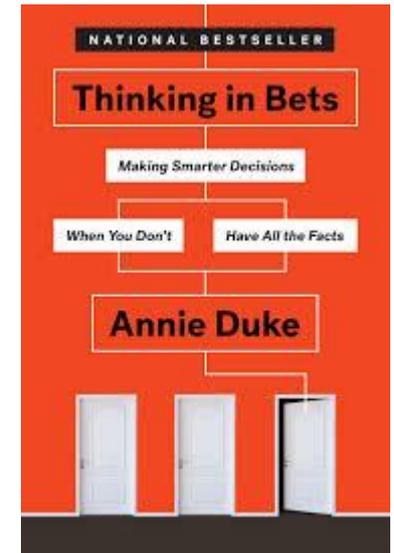
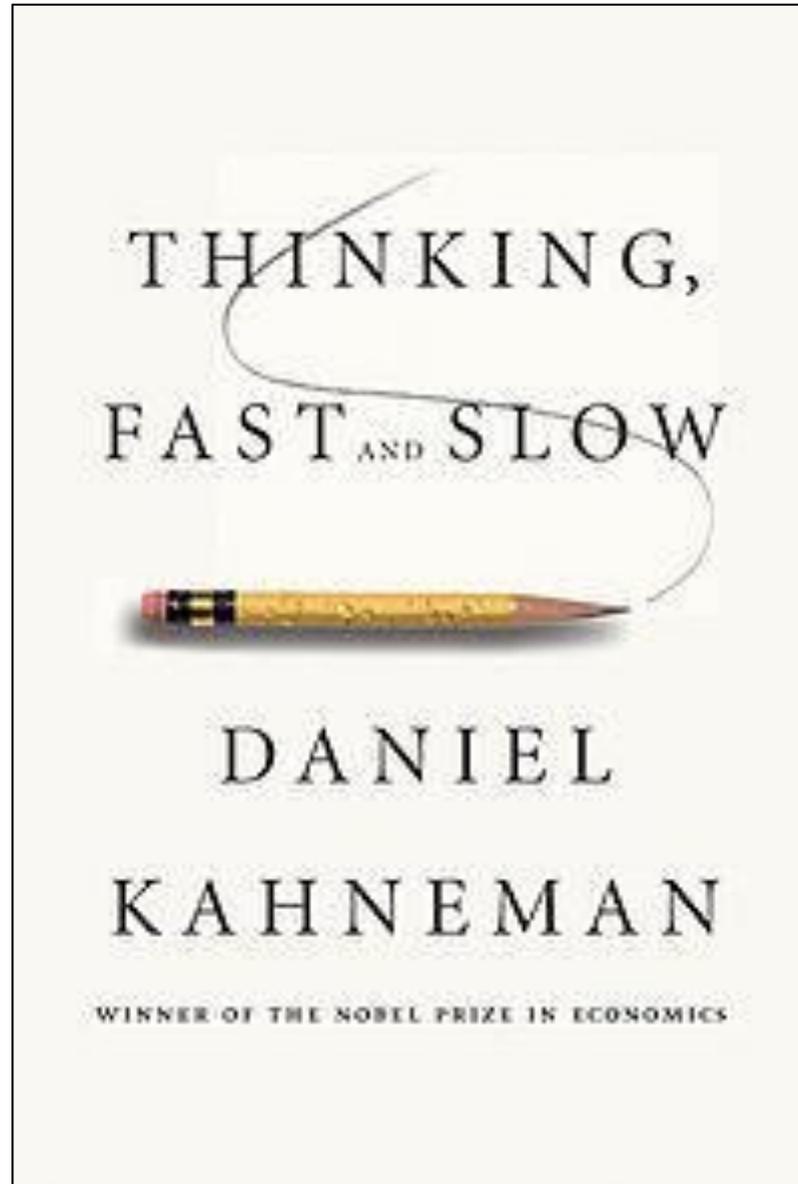
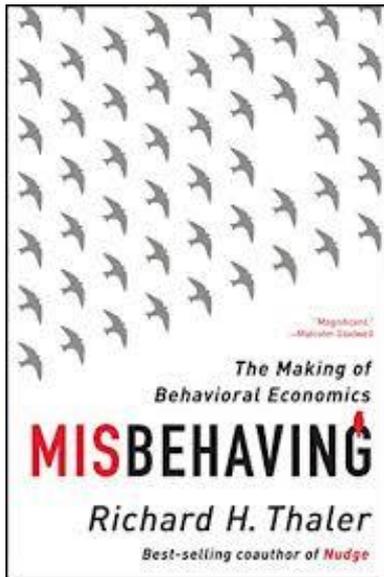
- “Mister Market, sad to say, has incurable emotional problems.
- At times he feels euphoric and can see only the favorable factors affecting the business.
- At other times he is depressed and can see nothing but trouble. On these occasions he will name a very low price, since he is terrified that you will unload your interest on him.
- Under these conditions, the more manic-depressive his behavior, the better for you.”

The “Anomalies” that Endure

- Stocks beat Bonds
- Value Investing beats Growth
- Small Caps beat Large Caps
- Momentum Exists

BEHAVIORAL FINANCE HELPS EXPLAIN THEM ALL

The Best Books on Behavioral Finance



Ariel Behavioral Finance Biases

1. Confirmation Bias

The tendency to seek data that is compatible with beliefs currently held and to reject conflicting data.

2. Overconfidence

The tendency to overestimate what one knows and underestimate the uncertainties of the future.

3. Anchoring on Prior Estimates

The tendency to adjust prior estimates insufficiently when presented with new information.

4. Loss Aversion

The tendency to overweight losses relative to gains.

5. Endowment Effect

The tendency to overvalue that which one owns versus that which one doesn't own.

6. Reliance on Intuition over Data – Small Sample Size

The tendency to think one's gut instinct is superior to data/ and to overestimate the significance of very small samples.

7. Vividness/ Recency Effect

The tendency to measure frequency by one's ability to think of examples; which in turn produces a tendency to overweight recent examples.

Prospect Theory

- Evaluation is relative to neutral reference point usually the status quo. Outcomes are judged, not on an absolute basis, but relative to what I have now.
- Loss Aversion: losses loom larger than gains. This asymmetry has an evolutionary history. Organisms that treat threats as more urgent have a better chance to survive.

Confirmation Bias

- The tendency to seek data that is compatible with beliefs currently held and to actively reject contrarian data.
- Example:
 - Passing around article that agrees with you but dismissing a contrary article as “one person’s opinion.”
 - Watching Fox News if you are a republican and MSNBC if you are a democrat.
- Bad News: The smarter you are the worse you behave.
- Fix:
 - 1) Devils Advocate.
 - 2) Make it someone’s job to present the bear case.
 - 3) Create workout group.
 - 4) Re-underwrite the decision.
- First Step: If you are a republican, follow Rachel Maddow on Twitter. If you are a democrat, follow Charlie Kirk.

Overconfidence/ Planning Fallacy

- The tendency to overestimate what one knows and underestimate the uncertainties of the future.
- Also: the tendency to produce projections that are close to best case scenarios.
- We ALL have biases, usually the result of small samples
Good News: We can more easily see the bias in others.
- Problem:
 - Life is not a controlled experiment.
 - Future is rarely certain or single outcome.
 - Results usually not binary, affected by multiple factors.
- Fix:
 - 1) Think in bets.
 - 2) Make testable assertions and write them down.
 - 3) Place probabilities on different scenarios.
 - 4) Get your teammates to give you feedback.

Overconfidence/ Planning Fallacy

- Example: “ABC Corp. is going to pay a big FCPA fine. We should avoid the stock.
- Problem: Imprecise assertion. What is “big?”
“Is going to pay” implies certainty. This WILL happen.
The assertion doesn’t invite constructive feedback.
No one wants to tell you you’re overconfident.
- Answer: Think and speak in probabilities and bets
Even when you don’t know the real probabilities.
- Common Response: “But I don’t know the actual probabilities”.

Thinking in Bets

- Questions to Narrow Range

Q: "How are FCPA fines determined?"

A: "Can be up to 100% of past earnings in affected countries."

Q: "For ABC Corp., what operating income came from Russia?"

A: "\$250 million over the last 10 years."

Q: "Does the government add on punitive damages?"

A: "Sometimes, but not always."

Q: "What have been the largest FCPA fines in history?"

A: "Number 10 was \$365 MM. Number 1 was Siemens \$800 MM."

- | Fine | \$0-25 MM | \$25-100 | \$100-300 | \$300-500 | \$500+ |
|--------------|-----------|----------|-----------|-----------|--------|
| Probability | 10% | 30% | 35% | 25% | 3% |
| Betting Line | +900 | +233 | +186 | +300 | +3,233 |

- Expected Value at midpoint of ranges = \$205 MM
Market Cap is \$20 billion, so EV of Fine is ~1%

Anchoring Effect

- Tendency to adjust prior estimates insufficiently when presented with new data.
- Possible explanation for Momentum.
- Examples: Target prices moving up slowly despite dramatic earnings beat.
- Fix: 1) No penalty for revisions.
2) Change of view encouraged.

Endowment Effect

- Tendency to overvalue that which we own versus that which we don't own.
- People do NOT think grass is greener on other side.
- Fix: 1) Watchlist which compares valuation and quality of that which we own versus that which we don't.
2) Devil's advocate.

Availability Heuristic

- Tendency to measure frequency by one's ability to think of examples.
- Example: Overestimating chance of company started by college kid in dorm room succeeding (Dell, Microsoft, Facebook).
- Explanation for Value outperformance over Growth.
- Fix: Look at the data, but it's difficult. "We are all captives of our experiences."

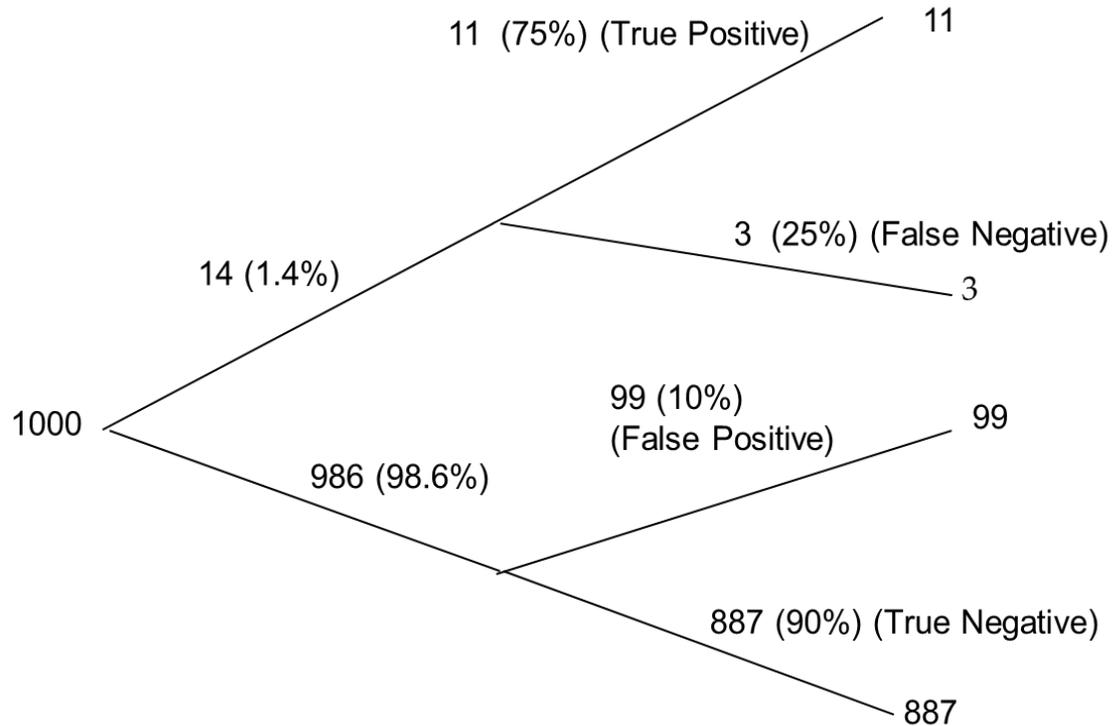
Reliance on Intuition over Data

- Tendency to think one's gut instinct is superior to data.
- Controversial within investment community
"Blink" versus "Moneyball".
- Fix: 1) Look at the data.
2) Remind teammates of law of small numbers. "Is that a sample size of one?"

Poor Statistical Intuition

- 1.4% of men under age 50 have lung cancer.
- 75% of men with lung cancer test positive (true positive).
- 10% of men who do not have lung cancer test positive (false positive).
- A man under 50 tests positive. What is the probability that he actually has lung cancer?
- Fix: 1) Do the math.
 2) Define betting line.

Bayes Law



P = Prior Probability or Pool
TP = True Positive of the Test
FP = False Positive of the Test

$$\frac{P \times TP}{P \times TP + ((1-P) \times FP)}$$

$$\frac{0.014 \times 0.75}{0.014 \times 0.75 + (.986 \times .10)} = 9.6\%$$

The “Anomalies” that Endure

- Equities beat Bonds.
Explanation: Loss Aversion, Overconfidence.
- Value Investing beats Growth (not lately).
Explanation: Planning Fallacy, Optimism Bias, Availability Heuristic.
- Small Caps beat Large Caps.
Explanation: Endowment Effect, Loss Aversion.
- Stock Price Momentum Exists.
Explanation: Anchoring, Loss Aversion.