Behavioral Finance

Over-Confidence

Duke UNIVERSITY

Overconfidence Overview

Overconfidence is a bias that works in our favor in many contexts. Overconfidence is what drives the entrepreneur to start afresh after one, two, three or even more start-up failures. It is a necessary ingredient in our willingness to "try, try again." If we were all correctly calibrated as to our abilities, the rate of progress in our society would be significantly decreased. We *need* overconfidence to stimulate progress.

Nonetheless, our inflated views about our knowledge and abilities can, of course, be detrimental in many contexts. Overconfidence can drive investors to make increasingly foolish financial choices, and can cause business managers to drive their corporations into the ground. Overconfidence is the precursor to "throwing good money after bad", as we will see in multiple contexts this week.

Over-Confidence

- How good a driver are you? Relative to the drivers you encounter on the road, are you:
  - above average
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In surveys of Americans of most ages and demographics (including college students), the majority of respondents will respond that they are above-average. This is *least* likely to be accurate among college students, who are both less experienced, and less cautious than others on the road – and yet this demographic is particularly inclined to assert their above average abilities.

Over-Confidence and Over-Trading

- A study was carried out utilizing trading activity of 60,000 individual investors over a six year period. The results included the following observations:
    - Individual investors weight their portfolios towards small-cap "value" stocks (which tend to have higher risk and higher average returns)
    - Prior to trading costs, individuals beat the value-weighted market index by 60 basis points (0.6%) – but trading costs ate up 240bp (2.4%) of returns
    - Individuals tend to be under-diversified in their portfolios
    - Investors who traded most often lost the most money
    - Men traded 45% more than women, chose higher risk stocks, and earned less
- Over-confidence appears to be more evident among:
    - Men rather than women
    - Younger rather than older people (most on-line traders during the internet boom were between 25-45)

Over-Confidence and Self-Attribution Bias

- Individuals tend to ascribe their successes to their own talents, but their failures to bad luck
  - News that confirms the investor's own views is given considerable attention
  - News that tends to disconfirm the investor's views is discounted
  - *Outcome:* short-term market momentum as investors *over-react* to news that confirms their initial bias, and *under-react* to disconfirming information
- Self-attribution bias tends to generate *increased* over-confidence, as individuals give greater weight to outcomes that support their original hypothesis
  - *Self-fulfilling prophecy:* if everyone believes that the market will go up, it will in fact go up, perpetuating investor over-confidence
  - Overconfidence increases over time as a function of past investment success
  - Remember: "don't confuse brains and a bull market."

Over-Confidence and Corporate Finance

- Over-confident executives underestimate the time and uncertainty with respect to a new project. This is known as the Planning Fallacy.

- This is costly for two reasons:

  - The longer the time to completion, the greater the variable costs (e.g., labor, administration)

  - The longer the wait for positive cash flows, the lower the true Net Present Value, because profits from the delayed project will start later than originally projected

- These problems may be exacerbated by:

  - Commitment escalation: misplaced persistence with a project because to cancel it means admitting to a mistake

  - Sunk cost bias: continuing with a project despite its negative expected value, because of the amount of money that has already been spent

Over-Confidence and Corporate Finance

- Corporate executives also tend to over-estimate overall market returns, and also *their expertise in predicting such returns.* This is known as Illusion of Control
  - A business school recently carried out surveys of several hundred CFOs over a six year time period. They asked the CFOs to provide estimates of that year's market return with *80% confidence intervals**
  - Actual market returns were within the CFOs' 80% confidence range only 38% of the time
- Overconfident CFOs will tend to:
  - Use lower discount rates to discount cash flows
  - Invest more often in projects
  - Use more debt (especially long term debt)

* The CFOs were asked to provide a *range* of possible US equity market returns for the year, such that they were 80% certain that the return would be within their range. The CFOs typically set their range too tight: 11% - 18%, for example. If the actual market return were 10%, this would be outside the CFO's "confidence interval" – thus he would be wrong.

Are Women Less Over-Confident than Men?

- Recent research* suggests that female executives tend to be less over-confident than men, as evidenced by:
  - Male executives undertake more corporate acquisitions
  - Male executives typically issue more debt
  - Female executives place wider bounds on their earnings estimates (remember the “narrow range” problem on the previous slide)

*Huang & Kisgen 2013, “Gender and corporate finance: Are male executives overconfident relative to female executives?” Journal of Financial Economics

Belief Perseverance & Confirmation Bias

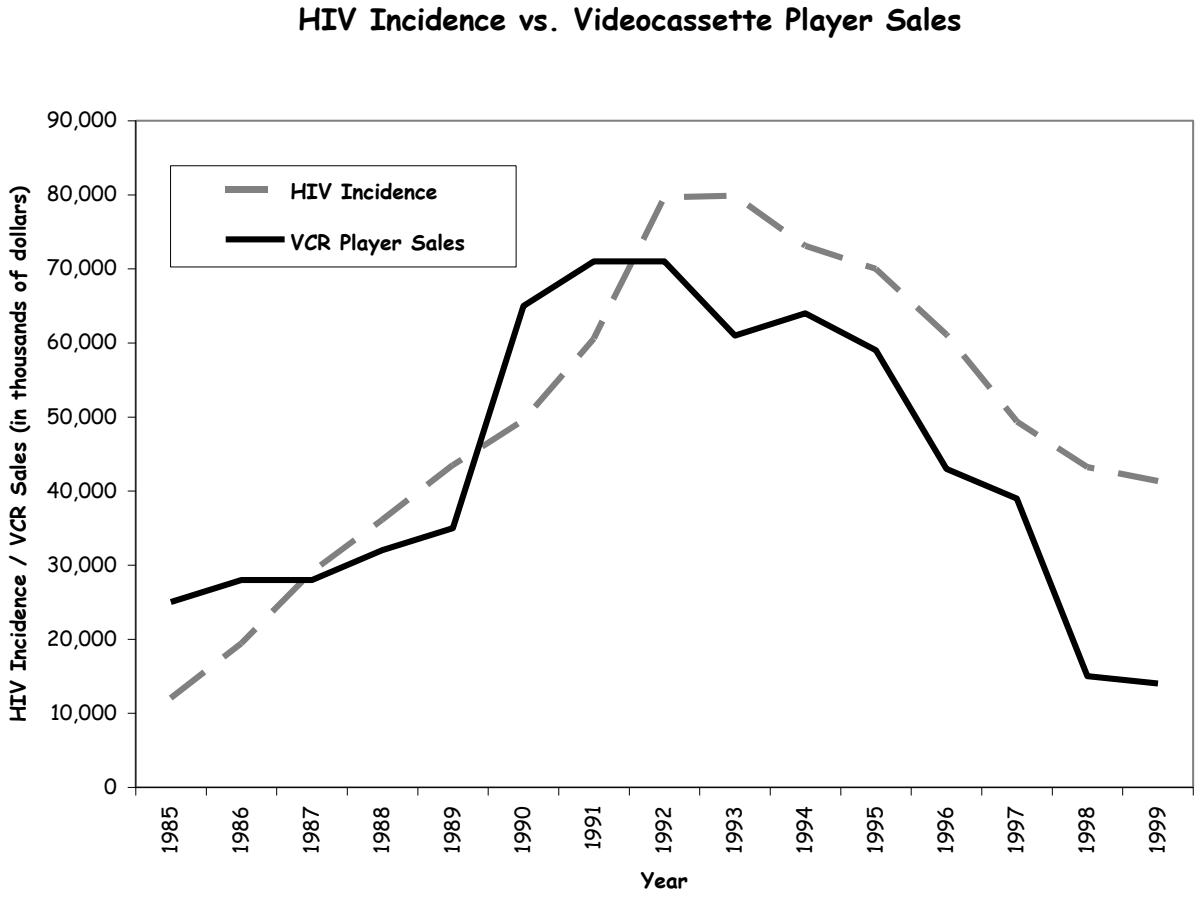
- Belief Perseverance: Having formed an opinion, people cling to it too tightly, and for too long
  - Reluctant to search for evidence that contradicts their beliefs
  - If disconfirming evidence is presented, people tend to discount it (similar to self-attribution)

- Confirmation bias
  - Extreme version of belief perseverance: even to the point of misinterpreting evidence that goes against their hypothesis so that it appears to be in favor

See the Lecture: Belief Perseverance and Confirmation Bias

"The human understanding when it has once adopted an opinion draws all things else to support and agree with it."
[Francis Bacon]

Belief Perseverance & Confirmation Bias



- The chart above is accurate, and is based on real data for the US
- The chart shows that cases of HIV grew explosively in the mid to late 1980s, then stabilized and began to fall during the 1990s
- The same was true of sales of VCR players
- Based on this evidence, is there a connection between HIV incidence and VCR player sales?

Belief Perseverance & Confirmation Bias

- The relationship between HIV incidence and VCR sales is a coincidence; remember our earlier discussions about looking for connections between random data?

- If you look at data hard enough, for long enough, you will find periods of time in which completely unrelated data appear to show a link [data mining]

- Let's look at a second example of this type of coincidence, and how assumptions about correlation led (and continues to lead) to some suboptimal outcomes.

Case Study: Belief Perseverance

See the Lecture: Case Study – Belief Perseverance

- Subsequent research on far greater numbers of patients has shown no evidence of any association between the vaccine and autism.
- The US Center for Disease Control (CDC) states categorically that there is no link between MMR and autism.
- Several years after the Lancet article, it was revealed that the 12 subjects in the study were under examination *because* their parents had observed autism symptoms.
- It transpired that the researcher for the study was gathering information on behalf of parents who believed that their children were harmed by the vaccine.
- The results of the flawed Lancet report have been entirely discredited, and the Lancet has acknowledged that the article should never have been published, given the significant conflict of interest from the article's main author.

Case Study: Belief Perseverance

- Despite the enormous weight of evidence to the contrary, millions of parents in Europe continue to refuse the MMR vaccine, leading to localized epidemics on a reasonably regular basis.

- Given that the "MMR causes autism" belief first arose in the late 1990s, more than a decade of insufficient inoculations means that the 95% inoculation level required for herd immunity is far from being achieved in parts of Europe.

- Persistent belief by parents in the "MMR causes autism" fallacy may be partly driven by the following two "spurious correlations" (i.e., coincidences) that were further distorted into an "assumption of causality":

  Coincidence #1: Physicians began dispensing the MMR vaccine at a time (the late 1980s) when autism was becoming more commonly recognized and diagnosed. Increased *diagnosis*, not necessarily increased *incidence*, led to a belief that autism was on the rise.

  Coincidence #2: Children receive the MMR vaccine at around 18 months—approximately the same age at which parents of autistic children first start to notice behavioral symptoms in their children.

Remember the HIV – VCR correlation..

Case Study: Belief Perseverance: Why do we look for Causation?

There are a number of biases that tend to result in belief that there is a causal factor where none exists.

Which biases?

Uncertainty Aversion: especially where unpleasant outcomes are concerned, we want to know *why* these things happen. The belief that autism was on the rise led to a search for a reason – which was then neatly supplied by the Lancet article.

Illusion of Control: We like to believe that we have control over negative outcomes. The MMR – Autism link gave parents a *spurious* sense of control: that they could prevent their child from getting autism by refusing the MMR vaccine.

Availability heuristic: there was a huge media storm about the link between the MMR and autism when the Lancet article was first released. The more we hear about something, the more probable we believe it is.

Case Study: Belief Perseverance: Why do we refuse to update our beliefs?

Why do so many parents continue to believe in the spurious connection, given so much evidence to the contrary?

Anchoring & Belief Perseverance: if we take action based on an initial view (e.g., parents refusing the vaccine because they believed it caused autism), we are very reluctant to change that view, as it puts a spotlight on the earlier error in our decision-making.

Confirmation bias: Having once adhered to a view, and taken action, we avoid information that tends to conflict with that view, or find excuses as to why the new information is incorrect. Parents had every incentive *not* to pay attention to the reports that detracted from their initial opinion

Omission bias: Even the most remote fear that MMR might be linked to autism is enough for many parents to refuse it. If they give their child the vaccine and he subsequently develops autism, they will fear that it was their fault. The possibility of their un-inoculated child catching measles in the community would not trigger the same sense of responsibility – especially since, in the majority of cases, children fully recover from the measles.