Brain Games for Actuaries: Understanding Behavioral Finance

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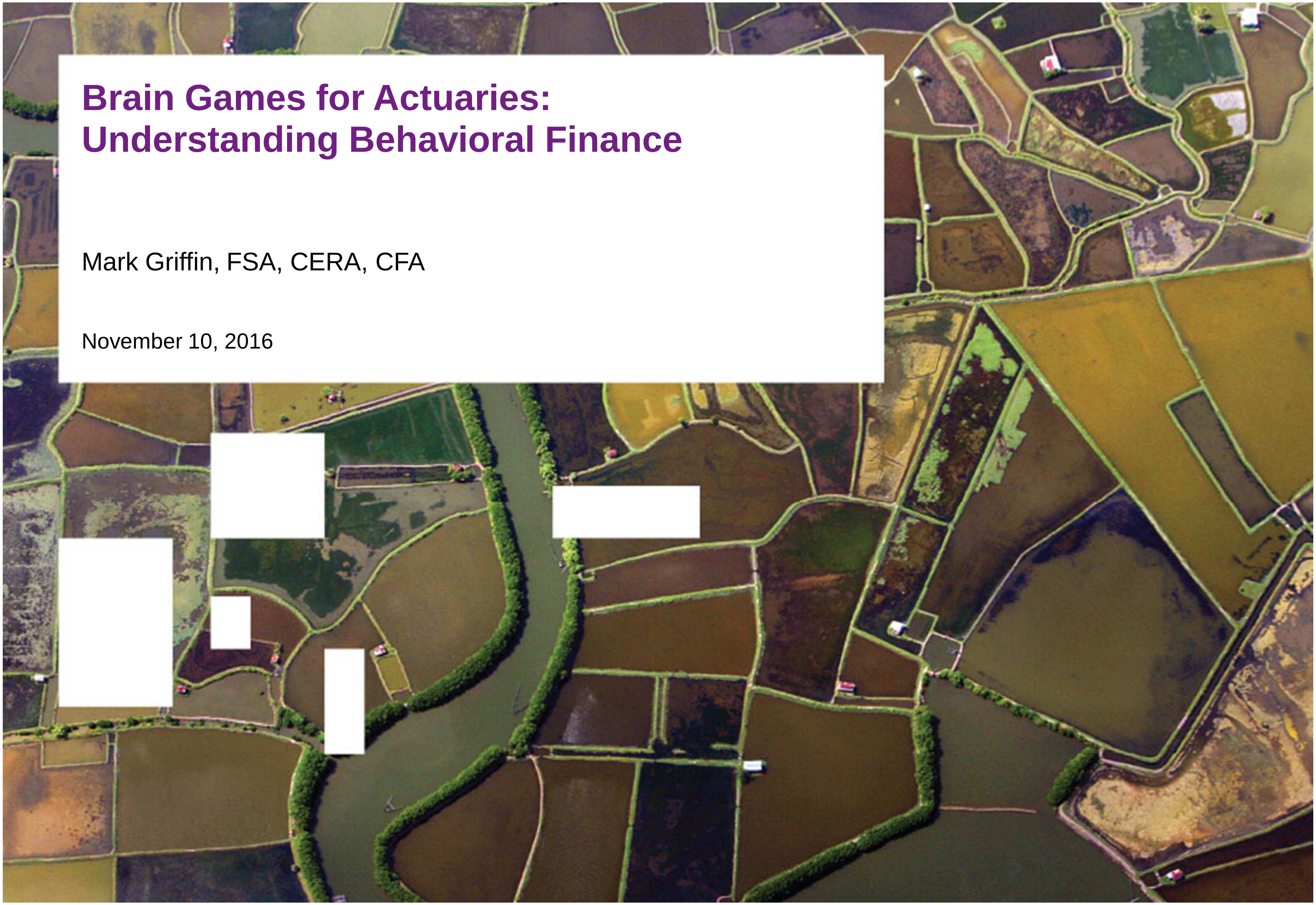


Willis Towers Watson

Agenda

- What is Behavioral Finance
- Hidden Traps in Decision Making
  - Anchoring
  - Overconfidence
  - Loss Aversion
    - Assumption Resetting Example
  - Confirming Evidence Trap
  - Status Quo
    - Experience Study Example
  - Endowment Effect
    - Resource Allocation Example
- Q&A

What is Behavioral Finance?

- Behavioral Finance is the study of our irrational behavior
- To be as effective as possible, we must take into account the ways in which our brains are predictably IRRATIONAL
- Consider rational decision making, in which we may:
  - Define/scope the problem
  - Identify and calculate possible outcomes
  - Assign probabilities and expected values to each outcome
  - Select the optimal outcome based on expected value
- But hidden traps in decision making could BIAS the problem definition, probabilities and selections
- AWARENESS can help avoid these traps

Anchoring Trap

Making an assessment by starting from an initial value and adjusting to yield a final decision

- We give disproportionate weight to the first information we receive
- We don’t make sufficient adjustments from this original “anchor”

“One of the most reliable and robust results of experimental psychology”

Daniel Kahneman

Overconfidence Trap

We are overconfident in our ability to estimate

“There is no reason for any individual to have a computer in their home.”

Ken Olson, Digital Equipment Corporation Founder, 1977

The more expertise one has…

- The more overconfident we become
- The more likely we are to overlook other perspectives

Loss Aversion

- Investors are overly reluctant to sell their loss-making positions because that would force them to admit they made a mistake
  - Instead, they hold on to these positions longer than positions with gains

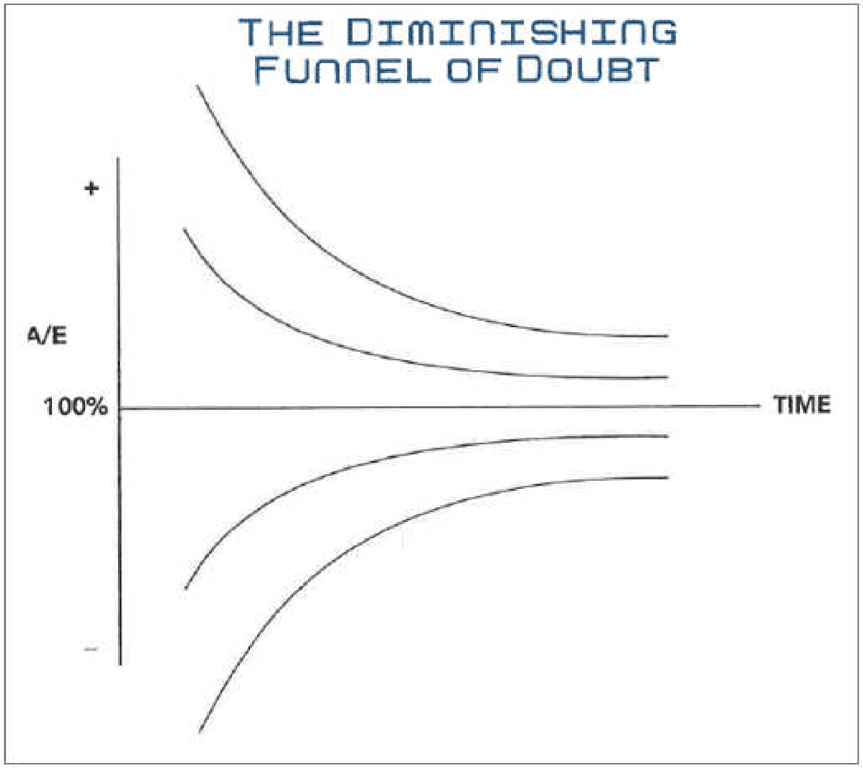
Actuarial Example – Assumption Resetting

- Internal and external auditors, and risk managers, are trying to design a “control environment” for financial reporting in insurance companies
- Assumption Governance is part of that challenge
- When adverse experience emerges with respect to one of our assumptions, we could be subject to:
  - Being overconfident of our original conclusion and too “anchored” to the data which caused us to make the assumption
  - Holding on to our assumption too long, hoping not to have to admit a mistake
- How can we ensure assumption resetting is done in a transparent, consistent way?

Actuarial Example – Assumption Resetting (continued)

Assume all assumptions are scientific facts

- Calculate expected period-by-period variability in terms of standard deviation
- Communicate results to lines of business and finance



Actuarial Example – Assumption Resetting (continued)

- Implementing as assumption resetting process
  - Example
    - If variation is greater than one standard deviation but less than two, the assumptions will automatically be reviewed
    - If variation is greater than two standard deviations, the assumption will be changed
  - This can be applied consistently over any assumption, over any time period
  - It is objective and transparent

Confirming Evidence Trap

- We collect or rely on data which confirms our predispositions (look for information which confirms our point of view)
- We tend to disregard data which contradicts it

We see what we expect to see

* Research conducted by Amos Tversky and Daniel Kahneman

Status Quo Trap

- Psychological comfort in the status quo – what we already know or do has advantage over most other alternatives
- This stems from the belief that taking action means taking responsibility, and sometimes that is scary or risky
- “Let’s not rock the boat”

Actuarial Example – Experience Studies

- Do we approach experience studies properly?
  - Are we looking for a quick confirmation of previous calculations?
  - Will we see new trends or interrelationships?
- Predictive analytics can avoid these pitfalls. For the best results:
  - Don’t limit the variables included to only those you think may be predictive
  - Include the type(s) of underwriting test used or even the underwriting results, if available, in the data
  - Include geo-demographic information

Actuarial Example – Experience Studies (continued)

- Predictive analytics
  - Objectively shows relationships between variables on an all-else-equal basis
  - Provides insight into the interaction of various factors that our naked eye may not catch
  - Doesn't rely on the user to formulate a specific question
  - Used in the P&C industry for two decades
- Examples of conclusions
  - Variable annuities: Increased dynamic behavior of larger policies may more than offset expense savings
  - Life: Discounts for higher face amounts may be excessive

Endowment Effect

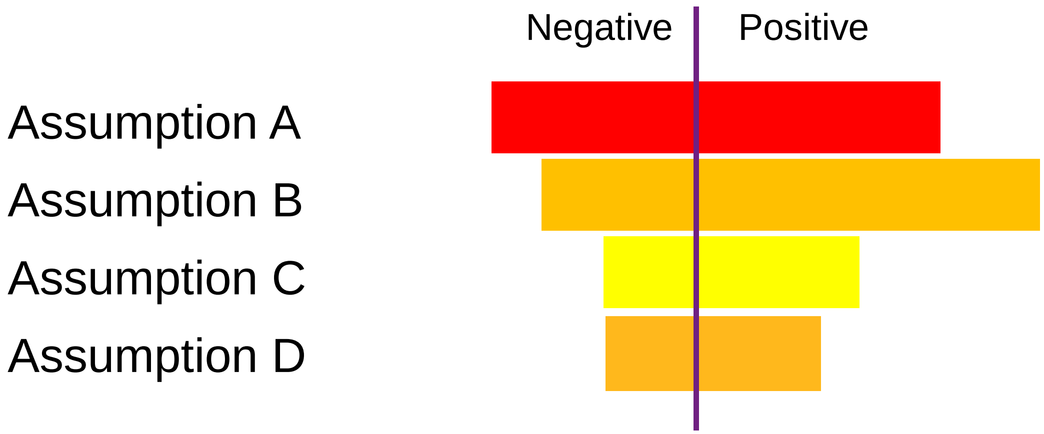
We value the things we have, and the things we have invested time in, more than we should

Actuarial Example – Resource Allocation

- In addition to:
  - Endowment effect
  - Confirming evidence trap
  - Overconfidence
- Studies show that we:
  - Choose projects for their ease, not their importance
  - Avoid the problems we cannot easily solve by substituting a problem we can solve
  - Are more engaged by things we like
  - Spend too much time on small decisions and not enough on big ones
  - Use information that is close at hand

Actuarial Example – Resource Allocation (continued)

- We can usually calculate the severity of particular events more easily than we can estimate their frequency
- Tornado charting is a tool to prioritize risks
  - Each major assumption is shocked by an arbitrary percentage
  - Severities are ordered and displayed as follows:



Actuarial Example – Resource Allocation (continued)

- The tornado chart can provide discipline on where we spend time and money
  - Are we committing the mistakes of overconfidence, confirming evidence and the endowment effect?
  - Without a fresh perspective, we will do what we did last year using the same tolls and data sources

Q&A

- Anchoring
- Overconfidence
- Loss Aversion
- Confirming Evidence
- Status Quo
- Endowment Effect

References

Various books and articles by Daniel Kahneman

Controlling Our Behavior

Mark Griffin, The Actuary, February / March 2015