Lizard Brains & Money

I. What is a Lizard Brain?
II. All People Have “Lizard Brains”
III. Our Lizard Brains Cost Us Money
IV. How to W.I.N.
The Lizard Brain

Prefrontal cortex
Lizard vs. Pre-frontal Cortex

• Pre-frontal cortex, rational, small, apparent, newer.
• Lizard Brain, emotional, large, hidden, older.
Lizard characteristics

• Powerful:
  – Many (most?) decisions are made by the lizard brain.
  – My gut told me to stay away
  – Just didn’t get the right feel

• Opaque
  – Difficult to understand the source or reason

• Impossible to turn off
  – Activated automatically
Take Home Message I

• There is more than one you.
• Pre-frontal cortex – rational, executive functions, human
• Lizard Brain – emotional, animalistic.
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Prefrontal cortex
Chinese Baby Puzzle

• Assume:
  – Every family keeps having babies until they have a boy.
  – Exactly 50% chance that a baby will be a boy.

• What % of the babies are boys.
  • A) more than 50% boys
  • B) 50% boys
  • C) less than 50% boys

• Hint:
  • 1/2 of families: 1 boy, 0 girls
  • 1/4 of families: 1 boy, 1 girl
  • 1/8 of families: 1 boy, 2 girls
HIV Test Question

• Assume:
  – HIV test is 95% accurate.
  – 1 in 1000 Australian women have HIV.

• Guess:
  – What is the chance an Australian woman who tests positive is actually sick?
Human Bird Brains?

- Most people cannot do probability.
- We fail even on simple problems
- Much easier than real world problems such as determining the price for Telstra stock.
- Central finding by behavioral economists – “heuristics and biases”
For the next screen.
Say the **colors** of the words

Examples:

**Ball**

**house**
<table>
<thead>
<tr>
<th>RED</th>
<th>GREEN</th>
<th>BLUE</th>
<th>YELLOW</th>
<th>PINK</th>
</tr>
</thead>
<tbody>
<tr>
<td>ORANGE</td>
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<td>GREEN</td>
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</tr>
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Same task for the next screen: Say the **colors** of the words
McGurk
THM II

• We all have Lizard Brains.

• Our actions are influenced significantly by the backs of our brains. These influences are powerful, hidden, and impossible to silence.
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III. Our lizard brains cost us money

- In the laboratory
- When we trade
- When we invest
An Easy Choice (for most)

$10 in 90 days

or

$11 in 91 days
A Harder Choice (for some)

$10 \quad $11

today \quad tomorrow

or
Impatient and Inconsistent

• Most people choose to wait a day for the $11 if the decision is in the distant future
• BUT, many people take $10 today.
• As the future becomes today, people will switch from the “rational” to the “impulsive”
Impatience Lives in the Lizard Brain

• McClure et. al study, 2004
• MRI during money choice
• Results
  – When all $s are in the future, the pre-frontal cortex decides
  – When some $s are today, the lizard brain gets excited
  – There is a battle. Lizard says give me the money today, Pre-frontal cortex says wait.
III. Our lizard brains cost us money

- In the laboratory
- \( \rightarrow \) When we trade
- When we invest
People Are Bad Traders

• 10,000 online brokerage accounts (no advisors!)
• Sell Stock A ("old dog") and buy Stock B ("new star") (switch horse)
• Compare 1 year returns, old dog vs. new star
• **Guess:** Old dog (under or out) performed new stars??
• **Bonus:** Guess the size of the gap in basis points
III. Our lizard brains cost us money

• In the laboratory
• When we trade
• → When we invest
People Are Bad Investors

- Business week 1979, “the old attitude of buying solid stocks as a cornerstone for one's life savings and retirement has simply disappeared.”
- 5% of Americans owned equities in early 1980s
Investors Missed HUGE Rally
Investors Chase Returns & Lose

Billions net into Equities

Sources: ICI, MSCI, Acadian  *part of year
Definition of a Quandary:
Should I sit back and watch the market soar, or buy and cause it to crash?
THM III.

• Our stupid financial decisions originate in the lizard brain.
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Risk and Return Theory
Risk and Return Reality

For illustrative purposes only
Preference For Lotteries

<table>
<thead>
<tr>
<th>Test # 1</th>
<th>Test # 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choose one of the following:</td>
<td>Choose one of the following:</td>
</tr>
<tr>
<td>A: ($6,000, p=0.45)</td>
<td>C: ($6,000, p=0.001)</td>
</tr>
<tr>
<td>B: ($3000, p=0.90)</td>
<td>D: ($3000, p=0.002)</td>
</tr>
</tbody>
</table>
Preference for Lotteries

Test # 1
A: (6,000, .45), B: (3,000 .90).
N=66

Test # 2
C: (6,000, .001), D: (3,000 .002).
N=66

*Not a recommendation to buy or sell a specific security.*
Preference for Lotteries

For unlikely events, people overweight the probability.

Thus, people are willing to overpay for a small chance to get rich.

Lottery tickets have negative expected value.

*Not a recommendation to buy or sell a specific security.*
Is buying a lottery ticket irrational?

What is a better business, buying lottery tickets or selling lottery tickets?
"WE HAVE MET THE ENEMY AND HE IS US."

...POGO
W.I.N.

• W
  – Wake up to the role of the Lizard Brain
• I
  – Investigate the influences of the Lizard Brain
• N
  – Neutralize the Lizard Brain for Money
#1: Ice man not Maverick

- Maverick, “if you think you are dead”, all lizard.
- Ice-man, disciplined, pre-frontal cortex.
- 99.99% of investors cannot be Maverick, and should not try.
#2: Don’t Anger the Lizard

Investment  +++
Hedge       ----

Or

Total  +++
#3: Even Geniuses Need an Advisor

- Even the best investors have lizard brains.
- A skilled advisor can help investors achieve their goals.
Cage the Lizard & Win

• Financial decisions are difficult and dangerous.
• Our own brain is a major obstacle.
• We cannot remove our inner lizard, but we can minimize the damage.
Terence Burnham is an employee of Acadian Asset Management LLC, a Boston based registered investment adviser. Mr. Burnham has been awarded a Bachelor of Science in Biophysics from the University of Michigan; a Master of Science in Computer Science from San Diego State University; a Master of Science in Management from the MIT Sloan School; and a Ph.D. in Business Economics from Harvard University. He has held economics professorships at the Harvard Business School, the University of Michigan and Harvard's Kennedy School and is an expert in behavioral finance and neuroeconomics.

Mr. Burnham is the author of two books, Mean Markets and Lizard Brains and Mean Genes. Acadian has not reviewed or approved of the content of either book.

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