

The Psychology of Risk: The Behavioral Finance Perspective



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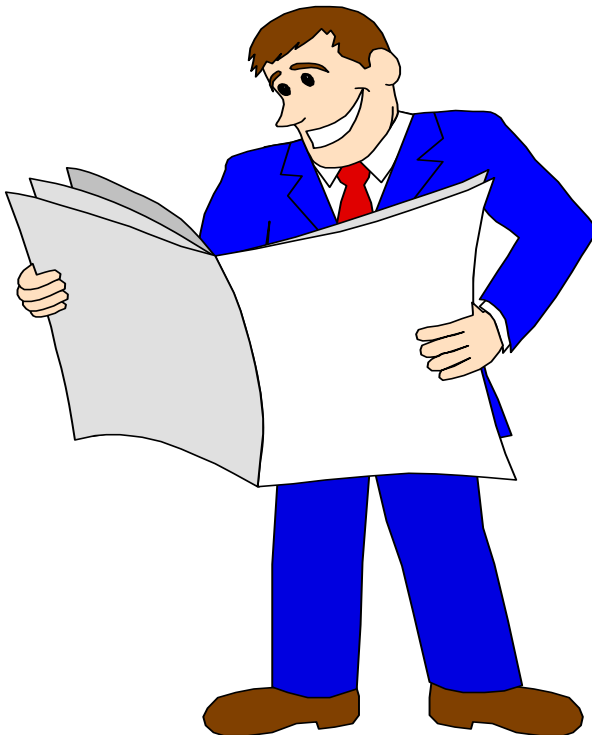
Agenda: The Main Points



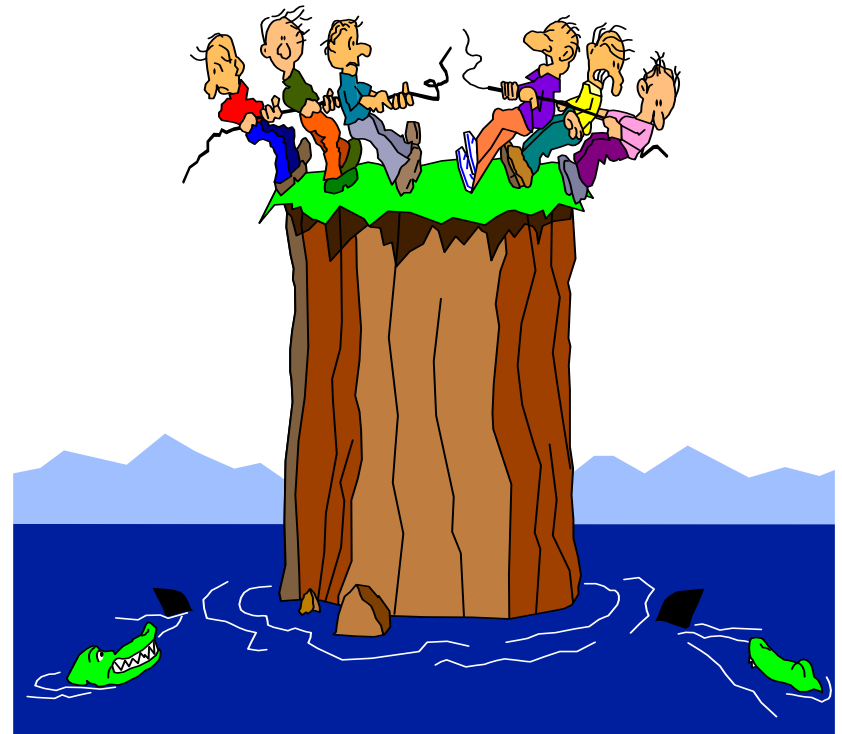
- What is standard finance?
- What is behavioral finance?
- What is the perspective of standard finance scholars about risk?
- What is the viewpoint of behavioral finance scholars towards risk?
- What are the specific factors that influence a person's risk perception based on information processing including cognitive and affective (emotional) factors?

Competition Between Two Schools of Thought: What type of decision-maker are you?

"Standard Finance" vs. "Behavioral Finance"



vs.



What is standard finance?

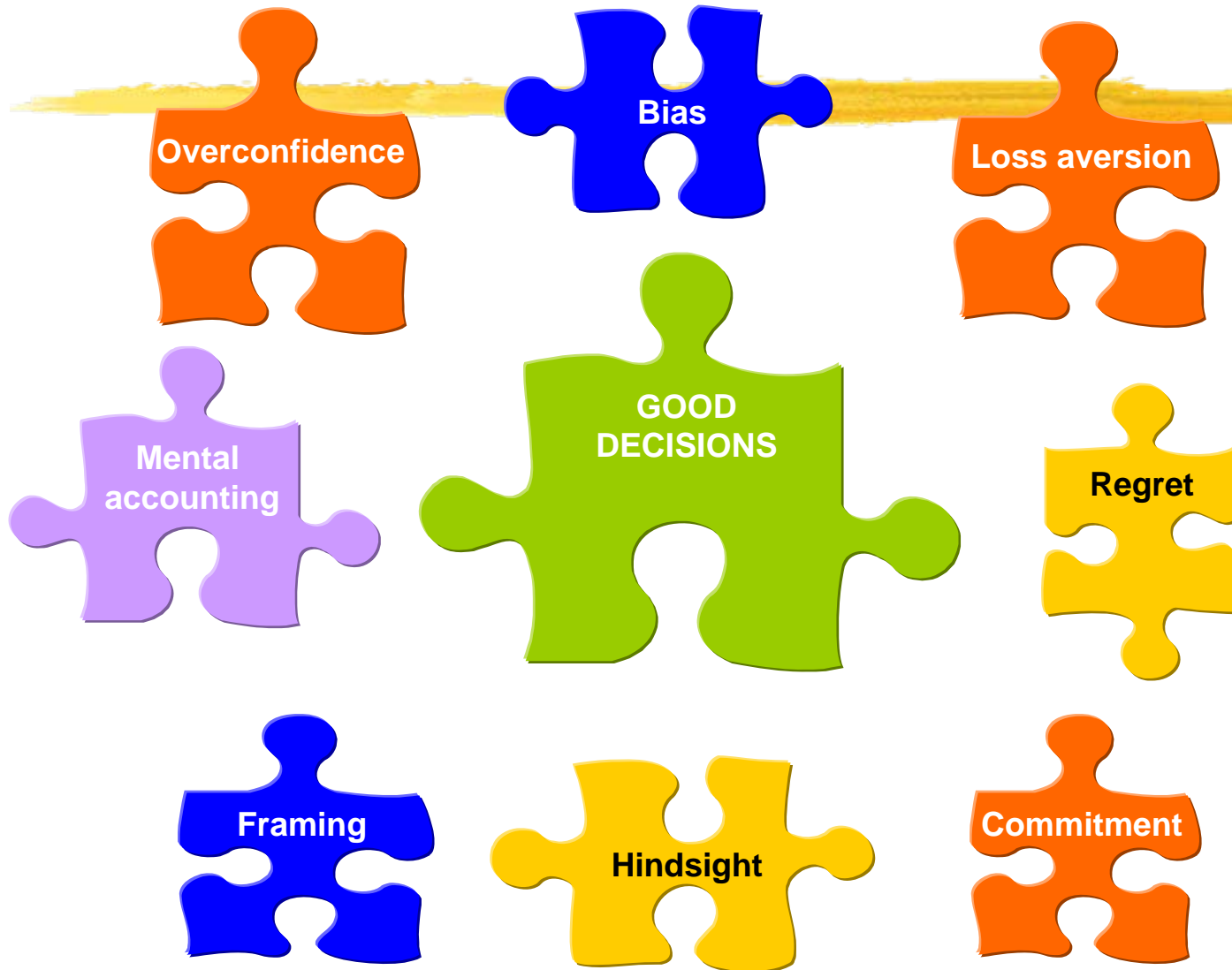


- The current accepted theories in academic finance are referred to as ***standard or conventional finance***. The foundation of standard finance is based on modern portfolio theory and the efficient market hypothesis.
- **Modern Portfolio Theory (MPT)** is a stock or portfolio's expected return, standard deviation, and its correlation with the other stocks or mutual funds held within the portfolio.
- Another main theme is known as the **Efficient Market Hypothesis (EMH)**. This concept states the premise that all information has already been reflected in a security's price or market value, and that the current price the stock or bond is trading for today is its fair value.

What is rationality according to standard finance?

- Rationality = Maximizing “something” (usually called “utility”)
- Individuals optimize over an infinite time horizon given rational expectations.
- *An underlying assumption is investors or agents do not interact with each other directly but through markets.*
- The lay person's notion of rationality is whether a behavior makes sense to an average person. For example, many people might think that sky diving is not rational.
- Theorists define rationality in terms of internal consistency of one's belief's and behaviors.

Judgments, Perceptions, Investments, Risks



What is behavioral finance?



- **Behavioral finance is a discipline that attempts to explain and increase understanding regarding how the cognitive errors (mental mistakes) and emotions of investors influence the decision-making process.**
- **Integrates the fields of psychology, sociology, and other behavioral sciences to explain individual behavior, to examine group behavior, and to predict financial markets.**

What recent study is an outstanding example of investor behavior?

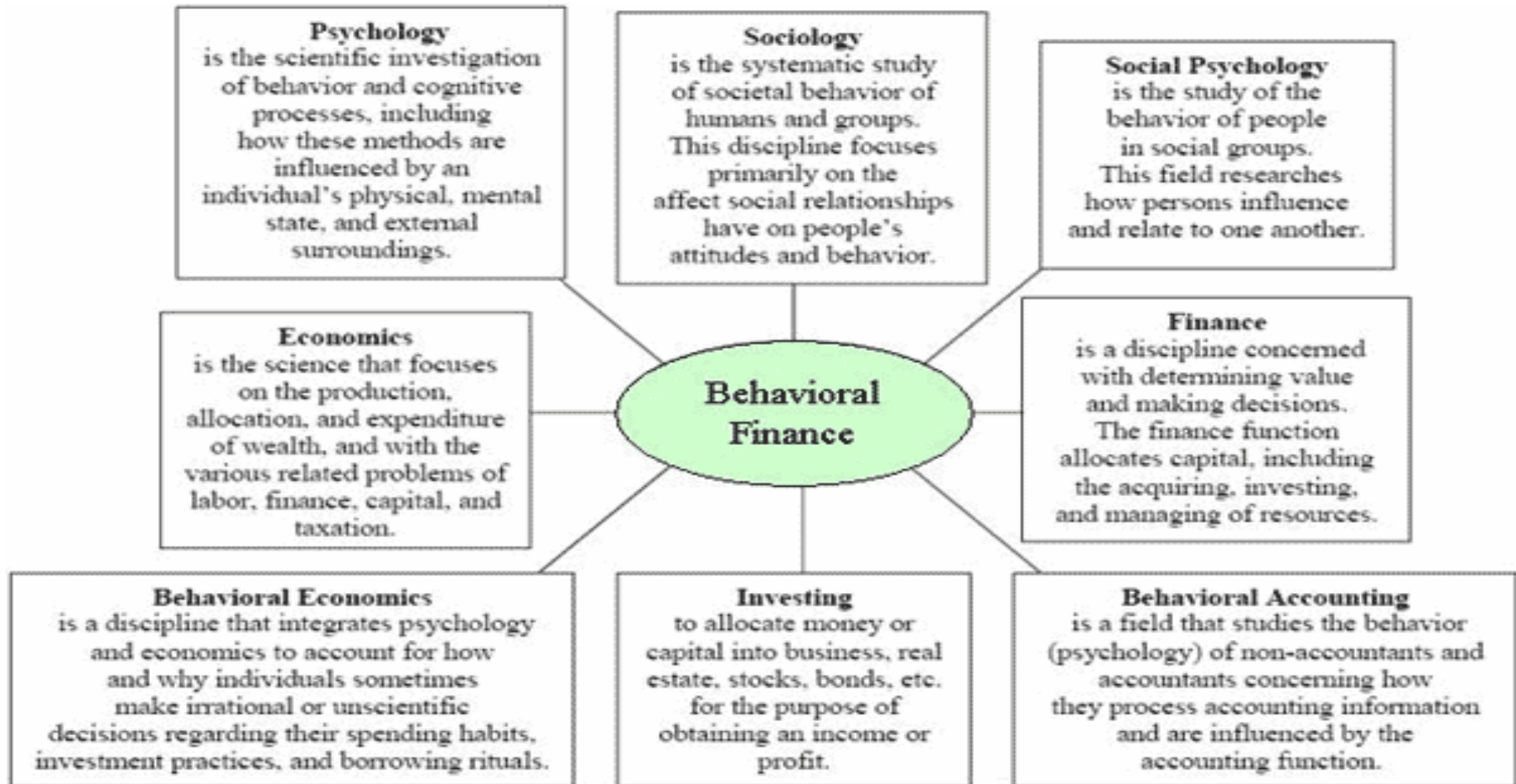
- The study by **Mitchell, Mottola, Utkus and Yamaguchi (2006)** examined the trading behavior of employees invested in 401 (k) plans.
- The study utilized a sample of 1.2 million workers enrolled in 1,500 different retirement plans, a very strong majority of the 401(k) plan investors are categorized by *intense inactivity*.
- The study revealed “most workers in defined contribution retirement plans are inattentive portfolio managers: only a few engage in any trading at all, and only a tiny minority trades actively.”
- Nearly all retirement investors (approximately 80%) execute no trades, and an additional 11% makes just a single financial transaction, over a two-year period (2003-2004).

What is the meaning of rationality according to behavioral finance?



- **People are not always rational:**
 - Many investors fail to diversify, trade too much, and seem to try to maximize taxes by selling winners and holding losers.
- Independent deviations from rationality
 - Psychologists argue that people deviate from rationality in predictable ways:
 - **Representativeness:** drawing conclusions from too little data.
 - This can lead to bubbles in security prices.
 - **Conservatism:** people are too slow in adjusting their beliefs to new information.
 - Security Prices seem to respond too slowly to earnings surprises.

What is the interdisciplinary nature of behavioral finance?



The Behavioral Finance Checklist: The Main Issues, Topics, and Theories

Anchoring
Chaos Theory
Cognitive Errors
Loss Aversion
Anomalies
Overreaction
Mental Accounting
Risk Perception
Overconfidence
Regret Theory
Groupthink Theory
Prospect Theory
Affect (Emotions)
Illusion of Control
Downside Risk
Below Target Returns

Financial Psychology
Cognitive Dissonance
Contrarian Investing
Herd Behavior
Market Inefficiency
Underreaction
Irrational Behavior
Behavioral Economics
Hindsight Bias
Economic Psychology
Group Polarization
Behavioral Economics
Behavioral Accounting
Cognitive Psychology
Experimental Psychology
Views of Experts vs. Novices

Cascades
Fear
Crashes
Greed
Fads
Framing
Heuristics
Gender Bias
Preferences
Manias
Risky Shift
Panics
Issues of Trust
Issues of Knowledge
Familiarity Bias
Information Overload

What are three important assumptions of behavioral finance?

1. **Loss aversion:** the characteristic of seeking to limit the size of the potential loss rather than seeking to minimize the variability of the potential returns.
2. **Bounded rationality:** the manner in which human beings behave, that is, with limits on their rationality. People's choices in financial matters are shaped not only by knowledge and rational thinking but also by our past experiences, beliefs, values and emotions.
3. **Denial of risk:** the tendency of some individuals to engage in risky behaviors on a voluntary basis, seemingly failing to appreciate the true level of danger in the situation. They may know the statistical odds but refuse to believe that these odds apply to them personally.

What is the perspective of standard finance scholars about risk?

- Standard finance scholars utilize the “traditional approach” to measure risk based on statistical measures and the distribution of possible outcomes.
 - This is typically the approach taught to undergraduate and graduate students enrolled in finance classes.
- Objective risk measures namely historical risk (i.e. beta, standard deviation) and various definitions of risk (i.e. credit risk, liquidity risk).
- **An emphasis on the macro-finance perspective:**

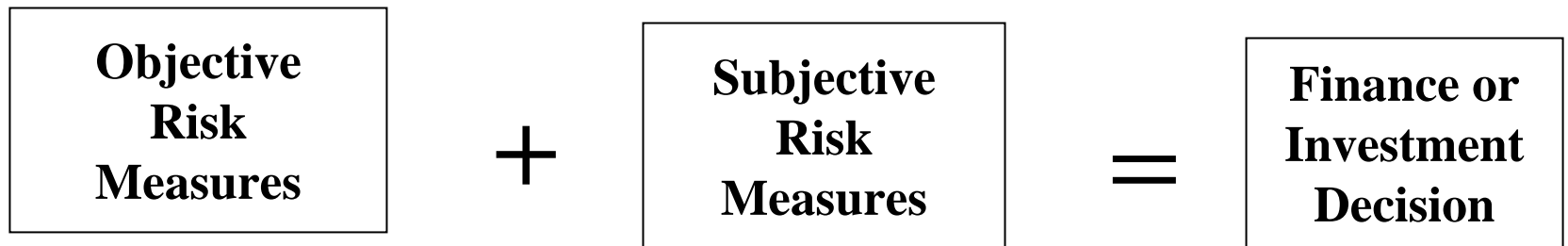
Objective measures of risk are based on a number of observations or calculations, with a focus on long-term data over a specific time period, and sophisticated statistical calculations or financial models to measure risk for specific financial instruments.

 - For instance, the concept of stock valuation.
- During the past 35 years, there has been an ongoing academic debate over the validity and reliability of beta and the CAPM as a measure for risk.

What is the viewpoint of behavioral finance scholars towards risk?

- Behavioral finance scholars employ the “behavioral approach” to evaluate risk based on data from laboratory experiments and survey/questionnaire instruments.
- *Risk has a subjective (perceived) component:*
The examination of beliefs, attitudes, and feelings towards risk for a specific situation, activity or circumstance.
- **An emphasis on the micro-finance perspective:**
An important aspect of the risk perception research is the focus on judgments of the *individual decision maker* and within a *group setting*.
- “Perceived risk is an *ex ante* measure which may be based on past returns, fundamental analysis, present hunches, and all other information that portfolio managers and analysts believe to be germane” (McDonald and Stehle, 1975).

What is the relationship between objective and subjective measures of stock risk?



The Standard Finance School

Stock Beta

Variance

Standard Deviation

The CAPM Model

The Behavioral Finance Scholars

Multidimensional Factors: An assortment of accounting and financial variables

The consequences of a large financial loss

The potential for below-target returns

Psychometric Risk Attributes: The level of worry or knowledge of risk by an investor

The Psychology of Risk

- **Risk Analysis:** Since the 1970s, there has been an ever changing and evolving area of research conducted by social scientists in the area of health issues (i.e. smoking behavior), safety concerns (i.e. seat belts in cars), environmental matters (i.e. the use of nuclear power) and industrial applications (i.e. new applications of biotechnology).
- **Risk = cognitive & emotional response to (expected) loss.**
- People respond to risk as they perceive the risks to be.
- Facts become irrelevant until the perception is brought into line with the truth.

What are the specific factors that influence a person's risk perception based on information processing including cognitive and affective (emotional) factors?

- **Heuristics**
- **Prospect Theory**
- Representativeness
- **Framing**
- Anchoring
- **The Role of Affect (Feelings)**
- **Overconfidence**
- **Loss Aversion**
- **Familiarity Bias**
- Perceived Control
- Expert Knowledge
- **The Influence of Worry**

Source: Ricciardi, V. (2008). The psychology of risk: The behavioral finance perspective. In F. J. Fabozzi (Ed.), *Handbook of Finance*. John Wiley & Sons, *Forthcoming*.

What are heuristics?



- A heuristic is a simple and general rule we employ to solve a specific category of problems especially with situations that involve a high degree of risk-taking or uncertainty.
- Heuristic refers to the process by which people find things out for themselves, usually by trial and error.
- Trial and error leads people to develop rules of thumb which often causes errors.
- When individuals are faced with a complex judgment involving a statistical probability, frequency or incomplete information, many individuals usually utilize a limited number of heuristics that reduce the decision to a simpler task (Kahneman, Slovic, and Tversky, 1982).
- “All of us have a repertoire of these strategies based on bits of knowledge we have picked up, rules we have learned, or hypotheses that worked in the past” (Myers, 1989, p.286).

What is the role of overconfidence?

- Confidence can be described as the “belief in oneself and one’s abilities with full conviction” whereas, “overconfidence can be taken a step further in which overconfidence takes this self-reliant behavior to an extreme” (Ricciardi and Simon, October 2000).
- As human beings we have a tendency to overestimate our own skills and predictions for success.
- An Illustration of Overconfidence: The explosion of the space shuttle *Challenger* should have not surprised anyone familiar with the history of booster rockets—1 failure in every 57 findings. Yet less than a year before the disaster, NASA set the chances of an accident at 1 in 100,000. (Rubin 1989)
- (Barber and Odean 1999) found men tend to be overconfident when compared to women regarding their investment decisions.

What is prospect theory?



- Prospect theory suggests:
 1. that individuals do not always act rationally (logically). This theory states that there are constant biases motivated by psychological issues that influence an individual's choices under circumstances of uncertainty.
 2. Hugh Schwartz (1998) states that "subjects (investors) tend to evaluate prospects or possible outcomes in terms of gains and losses relative to some reference point rather than the final states of wealth."

What is prospect theory?



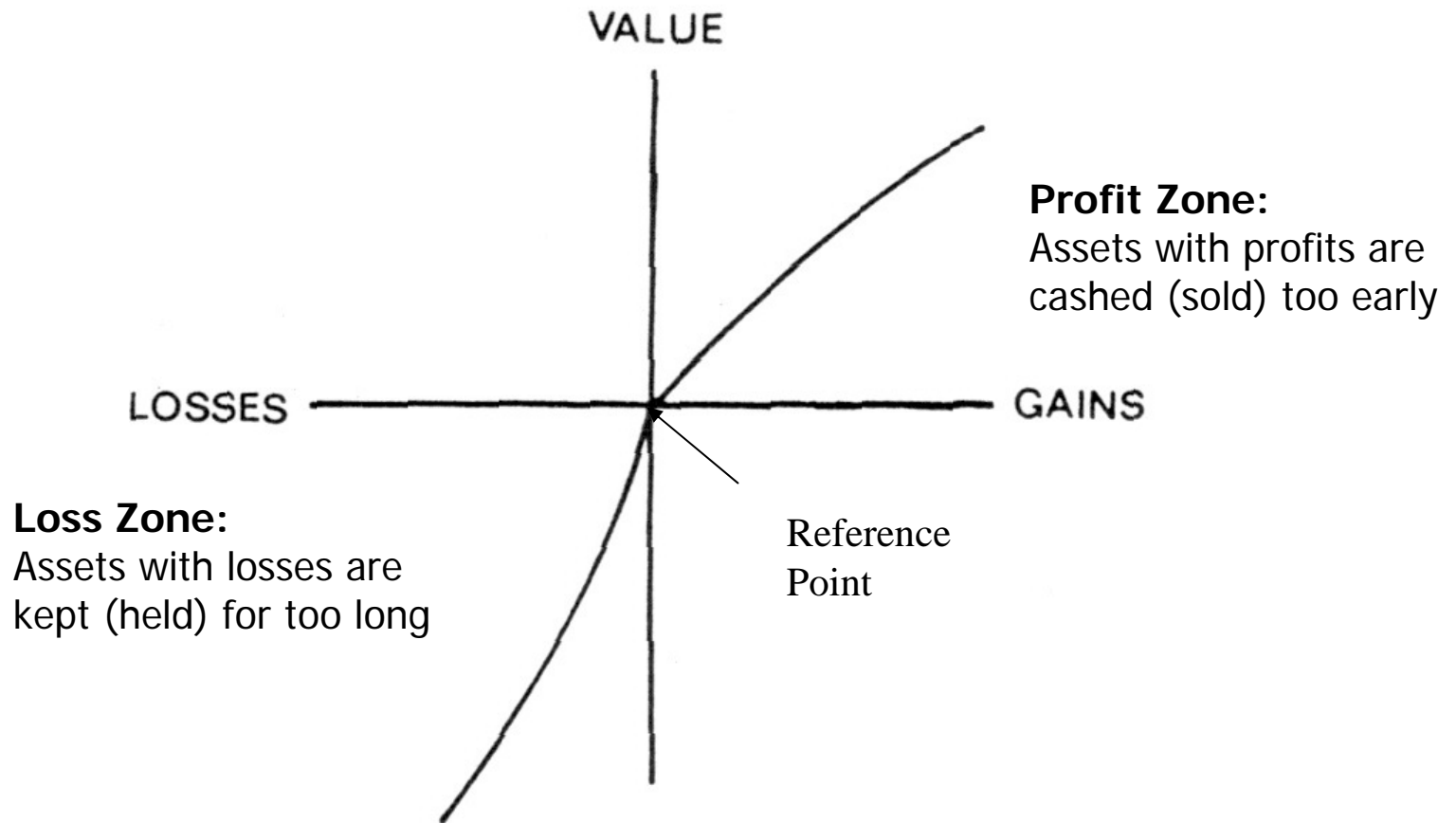
- To illustrate, consider an investment selection between:

Option 1: A sure profit (gain) of \$ 5,000 or

Option 2: An 80% possibility of gaining \$7,000,
with a 20 percent chance of receiving nothing (\$ 0).

Question: Which option would give you the best chance to maximize your profits?

What is prospect theory?



Loss Aversion: What is the concern for large or catastrophic losses?

- The degree or extent a person has concern over “incurring a large loss” or “substantial decline in wealth” in dollars terms rather than in percentages.
- Behavioral finance scholars make the assumption investors are loss averse rather than risk averse. (This is an underlying assumption of prospect theory.)
- A central premise of prospect theory is that individuals designate more significance to losses than they allocate to gains.
- Many academic experiments have demonstrated that for some investors that a loss bothers them twice as much in absolute terms than the pleasure from an equivalent gain.
- ***Loss aversion has an indirect link to the notion of downside risk:*** The investor’s “mind-set” is what’s the worst-case scenario for a well-diversified portfolio? Could I lose my entire investment in a stock?

What is familiarity bias?

- Familiarity bias is an inclination or prejudice that alters an individual's perception of risk. The phrase familiarity has been described as "to denote a *degree* of knowledge or experience a person has respect to a task or object" (Gigerenzer & Todd, 1999, p.57).
- Gilovich (1981) commented "we form associations between existing circumstances and past situations and are influenced by what we consider to be the implications of these past events."
- Applied within several areas of investment decision-making including:
 - 1) International finance and asset allocation in which investors demonstrate a preference for investing in domestic stocks (familiar assets) rather than international stocks (unfamiliar assets);
 - 2) Portfolio managers have demonstrated a tendency to invest money in local companies or stocks with recognizable brand names or reputations.

A visual presentation of *familiarity bias*:
Would you have invested your money in
the heavy metal band “**Motley Crue?**”



A visual presentation of *familiarity bias*:
Would you have invested your money in this “**motley crew?**”

Would you have invested?



Microsoft Corporation, 1978

What is framing?



- Framing is the way in which a question is structured with regard to the issue being evaluated. For example, the same objective facts can be described either in terms of the probability of gaining or the probability of losing.
- Consider the “distinctive impressions” presented by these two options:
 - Selection A:** Would you invest all your money in a new business if you had a 50% chance of succeeding brilliantly?
 - Selection B:** Would you invest all your money in a new business if you had a 50% chance of failing miserably?

What is the role of affect or feelings?

- In 1987, Brehmer was critical that many of the academic endeavors on perceived risk mostly concentrated on *cognitive issues* and all but disregarded the *emotional component* of psychological risk.
- Risk can be defined subjectively as the emotional response to a person's perception of fear, anxiety, chance, probability or consequence of loss.
- The fields of clinical psychology and other sub-categories of psychology have revealed that the emotional reactions and feelings towards risky circumstances or conditions often deviate from the cognitive appraisals of risk.
- **Positive affect:** An individual's tendency to accentuate the positive aspects of himself or herself, other people, and the world in general. Positive affect deals with a upside swing in feelings (i.e. happiness, optimism).
- In essence, investors perceptions of risk are influenced by their emotions, moods, or feelings regarding specific investment/financial decisions.

What is the importance of worry?



- Worrying is a lasting concern with a past or an upcoming event. It is a category of risk assessment that makes a person feel as if he or she were reliving a past occasion or living out a future one, and the individual cannot stop these types of contemplations from happening.
- A behavioral definition of worry is how a person might react towards a specific situation or decision that causes anxiety or as a source of unhappiness.
- Scholars identify worry (or the act of worrying) in various forms of cognitive factors and/or affective reactions in a sample of works on risk perception.
- **Negative affect:** An individual's tendency to accentuate the negative aspects of himself or herself, other people, and the world in general. Negative affect focuses on the downward aspect of emotion (i.e. worry, anxiety, fear, anger, sadness, shame).

What specific work is an excellent illustration of a behavioral finance risk perception study?

- The study by **MacGregor, Slovic, Berry and Evensky (1999)** focused on how the financial decision-making process is linked to various aspects of investments/asset classes, specifically expert's perceptions of returns, risk, and risk/return associations.
- A survey was mailed to financial advisors in which, the 265 participants that responded were asked to provide their assessment of a series of 19 asset classes with 14 specific variables.
- The main findings revealed with the utilization of multiple regression analysis with perceived risk as the dependent variable revealed that three significant factors (**worry, volatility, and knowledge**) explained 98% r-square of the experts' risk perception.
- Finucane (2002) further commented, "perceived risk was judged as greater to the extent that the advisor would worry about the investments, that the investments had greater variance in market value over time, and how knowledgeable the advisor was about the investment option."

Final points on risk perception



- People simplify.
- Once a person makes up their mind, it's difficult to change it.
- People remember what they perceive (see).
- People cannot detect omissions in risk information they receive.
- Individuals find it difficult to evaluate expertise.

References for this Presentation



- ⌘ **Book:** Beyond Greed and Fear: Understanding Behavioral Finance and the Psychology of Investing by Hersh Shefrin (2002)
- ⌘ **Classic Book:** Contrarian Investment Strategies: The Next Generation by David Dreman (1998)
- ⌘ **Article:** “Managing Risk: The Dividend Payoff” by John Buckingham & Mark Mowrey *AALL Journal* (November 2004), 25-27
- ⌘ **Academic Paper:** MacGregor, D. G., Slovic, P., Berry, M., & Evensky, H. R. (1999). Perception of financial risk: A survey study of advisors and planners. *Journal of Financial Planning*, 12(8), 68-86.
- ⌘ **Academic Paper:** The Inattentive Participant: Portfolio Trading Behavior in 401(k) Plans (2006) by Olivia S. Mitchell, Gary R. Mottola, Stephen P. Utkus and Takeshi Yamaguchi

My Papers of Reference in Behavioral Finance



- **For the undergraduate or novice investor:**
Ricciardi, Victor and Simon, Helen K., "What is Behavioral Finance?"
Business, Education & Technology, Vol. 2, No. 2, Fall 2000
Available at SSRN: <http://ssrn.com/abstract=256754>
- **For the graduate level student or new scholar in behavioral finance:**
Ricciardi, Victor, "A Research Starting Point for the New Scholar: A Unique Perspective of Behavioral Finance" (March 2005).
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Ricciardi, Victor, "A Risk Perception Primer: A Narrative Research Review of the Risk Perception Literature in Behavioral Accounting and Behavioral Finance" (July 20, 2004).
Available at SSRN: <http://ssrn.com/abstract=566802>

What are some basic references for information on behavioral finance?

- ❖ **A Behavioral Finance Library of Key Topics and Papers**
www.behaviouralfinance.net
- ❖ **The Wall Street Journal**
Jonathan Clements weekly news story usually provides a discussion of a behavioral finance topic.
- ⌘ **Yahoo Behavioral Finance Discussion Group**
<http://finance.groups.yahoo.com/group/Behavioral-Finance>
- ⌘ **The SSRN Behavioral & Experimental Finance Journal**
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Cohen, B. *The Edge of Chaos: Financial Booms, Bubbles, Crashes and Chaos*. New York: John Wiley & Sons, Inc, 1997