A Literature Review of Risk Perception Studies in Behavioral Finance: The Emerging Issues

Victor Ricciardi
Assistant Professor of Finance
Kentucky State University
victor.ricciardi@kysu.edu

Editor, eJournals in Behavioral/Experimental Finance, Economics & Accounting
The Social Science Research Network (www.ssrn.com)

Presented at the 25th Annual Meeting of the Society for the Advancement of Behavioral Economics (SABE) Conference, New York University, May 15-18, 2007

Agenda: The Main Points

- What is the viewpoint of social science researchers towards risk?
- What is the perspective of standard finance academics about risk?
- What is the viewpoint of behavioral finance academics towards risk?
- Ricciardi (2004): The basic characteristics and findings of the narrative research reviews from the risk perception literature in behavioral finance
- What are the specific factors that influence a person's risk perception based on information processing including cognitive and affective (emotional) factors?
- What are the emerging issues within the behavioral finance risk perception literature? My current research study

What is the viewpoint of social science researchers towards risk?

- Paul Slovic provides the following description of risk:

  > "Risk is inherently subjective... human beings have invented the concept *risk* to help them understand and cope with the dangers and uncertainties of life... Even the simplest, most straightforward risk assessments are based on theoretical models, whose structure is subjective and assumption-laden and whose inputs are dependent upon judgment. (2000, p. xxxvi)'

- Risk is perceived in qualitative (subjective) terms.
  - Personal controllability over exposure.
  - Dreadedness of potential (or actual) consequences.
  - A different viewpoint between experts and novices.
  - A person's perception of potential loss or catastrophic risk.
  - Risk has a cognitive and affective (emotional) aspect.

What is the viewpoint of social science researchers towards risk?

- Since the 1970s, there has been an ever changing and evolving area of research conducted by academics in psychology in the area of health issues (smoking behavior), safety concerns (seat belts in cars), environmental matters (the use of nuclear power) and industrial applications (biotechnology).
- Factor analysis was employed to determine the correlations between averaged risk indicators (a traditional set of 9 or 18 behavioral characteristics) applied across a collection of hazardous activities (30 risky activities).
- The risk characteristics (indicators) that have been developed in these studies has been duplicated in various risk perception studies and reconfirmed the basic 7-point Likert scale format for the measurement of risk variables.
- The “psychometric paradigm cognitive map” allowed scholars to plot the host of risky situations and hazardous activities within a two-factor space, which can be utilized to describe and forecast risk perceptions of these specific hazards.
- For instance, hazardous activities such as nuclear weapons, crime, and pesticides recorded high on the “dread factor” domain and were also professed by respondents as highly risky, whereas vaccinations, driving a car, and receiving anesthetics had low average means and were rated as low risk activities.

What is the viewpoint of social science researchers towards risk?

- The seminal works by the Decision Research organization (founded by Paul Slovic) utilized factor analysis to demonstrate that a wide range of risk indicators may be reduced to two main risk constructs or dimensions.
- The first factor developed was known as “Dread Risk” in which risks measured as possessing catastrophic potential, the severity of consequences, the risk to future generations, and the controllability of consequences.
  - **Dread**: People have a substantial anxiety or dread of risks whose severity they judge that cannot be controlled.
- The second risk factor was classified as “Unknown Risk,” and separates out between hazardous activities that are familiar, that have been around longer, and the have immediate consequences vs. those risky actions that are unfamiliar, new, and have belated causes.
  - **Familiarity**: Individuals are more comfortable and tolerant of risk when they are personally familiar with the specific activity, situation, or event.

What is the perspective of standard finance academics 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 (beta, standard deviation) and various definitions of risk (credit risk, liquidity risk).
- **An emphasis on the macro-finance perspective:**

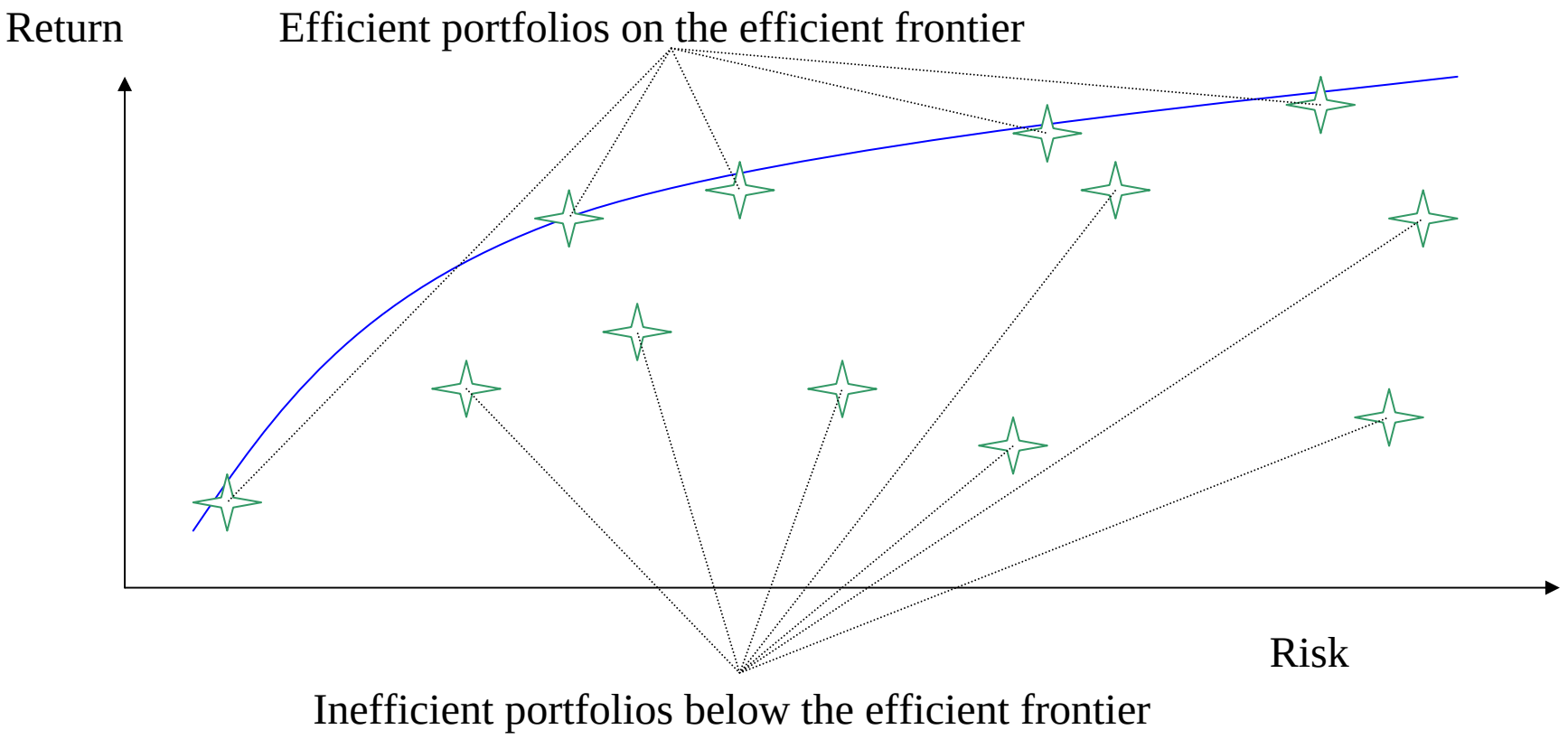
  Objective measures of risk are based on a number of observations or calculations, with a focus on long-term data over a specific time period, and sophisticated statistical calculations or financial models to measure risk for specific financial instruments.
  - For instance, the concept of stock valuation.
- During the past 40 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 efficient frontier according to standard finance?

- The efficient frontier is the term given to the line that combines all portfolios that have realized a maximum return for a predetermined level of risk. In other words, portfolios that are *efficient* based on the tenets of Modern Portfolio Theory (MPT).

- If an investor constructed a graph with every possible portfolio for a collection of assets and marked a point for the various risk and return relationships the resulting graph usually appears as the chart in **Slide 8**. The upper level of the curve is known as the efficient frontier, any risk-return points below the curve are considered inefficient portfolios, whereas, points on the curve are the efficient portfolio.

What is the efficient frontier according to standard finance?



What is the viewpoint of behavioral finance academics 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:**

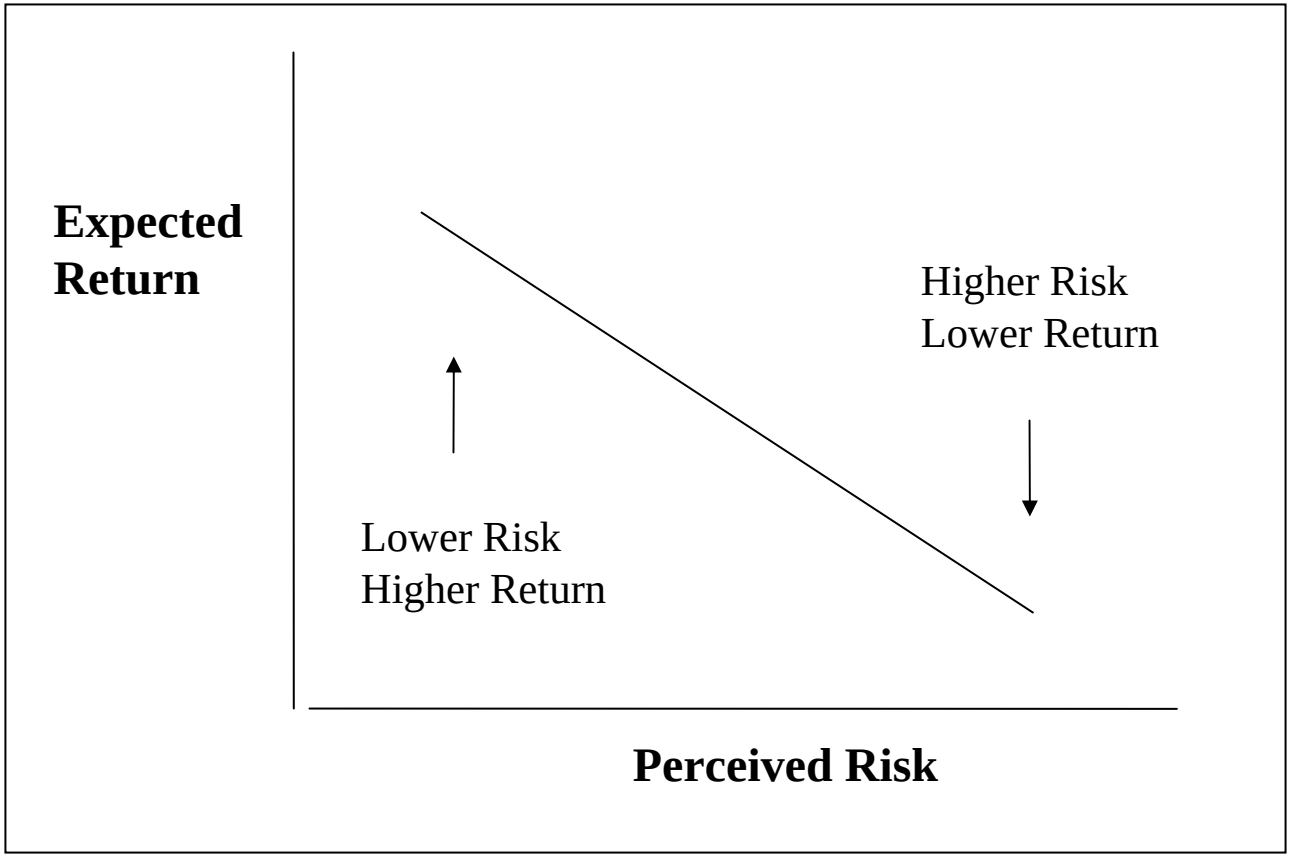
  An important aspect of the risk perception research is the focus on judgments of the *individual decision maker* and within a *group setting*.
- "Perceived risk is an *ex ante* measure which may be based on past returns, fundamental analysis, present hunches, and all other information that portfolio managers and analysts believe to be germane" (McDonald and Stehle, 1975).

What is the viewpoint of behavioral finance academics towards risk?

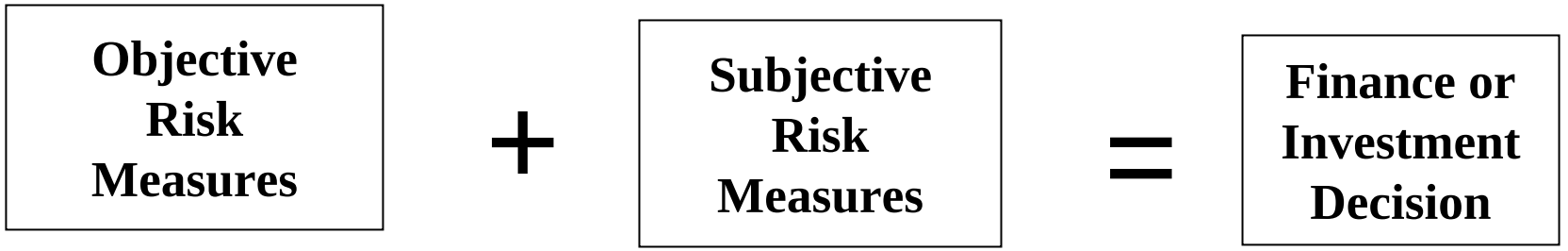
Olsen described the research work in the area of risk perception:

- Risk is multi-attribute in nature. It involves such elements as feelings of control, dread, and knowledge.
- Risk perceptions are influenced by social and cultural factors such as trust, fairness, and democratic values.
- Risk always contains an emotional or affective dimension. (2001, p. 159)

What is the risk and return relationship according to behavioral finance in represent to perceived risk?



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

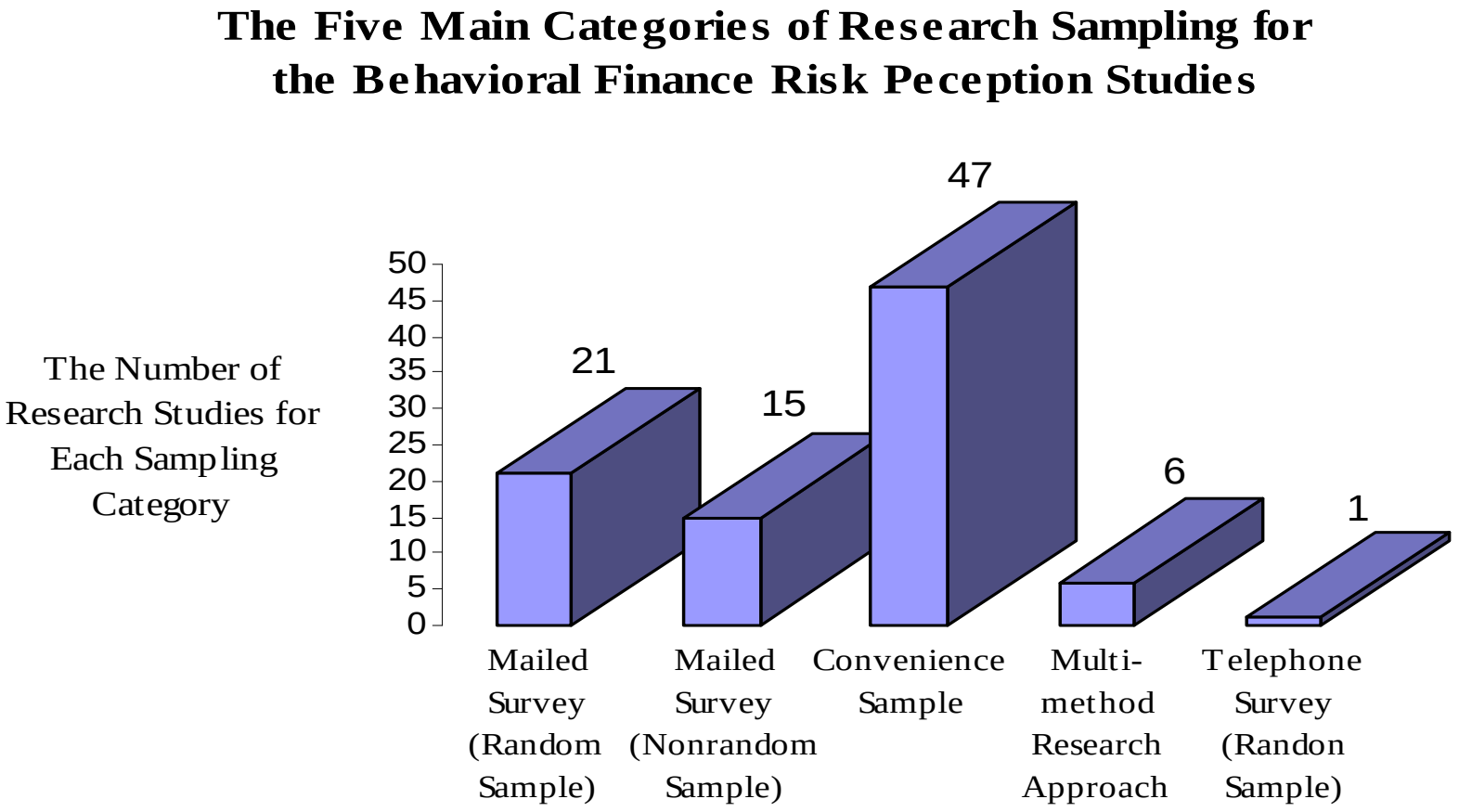


The Standard Finance School	The Behavioral Finance Scholars
Stock Beta	Multidimensional Factors: An assortment of accounting and financial variables
Variance	The consequences of a large financial loss
Standard Deviation	The potential for below-target returns
The CAPM Model	Psychometric Risk Attributes: The level of worry or knowledge of risk by an investor

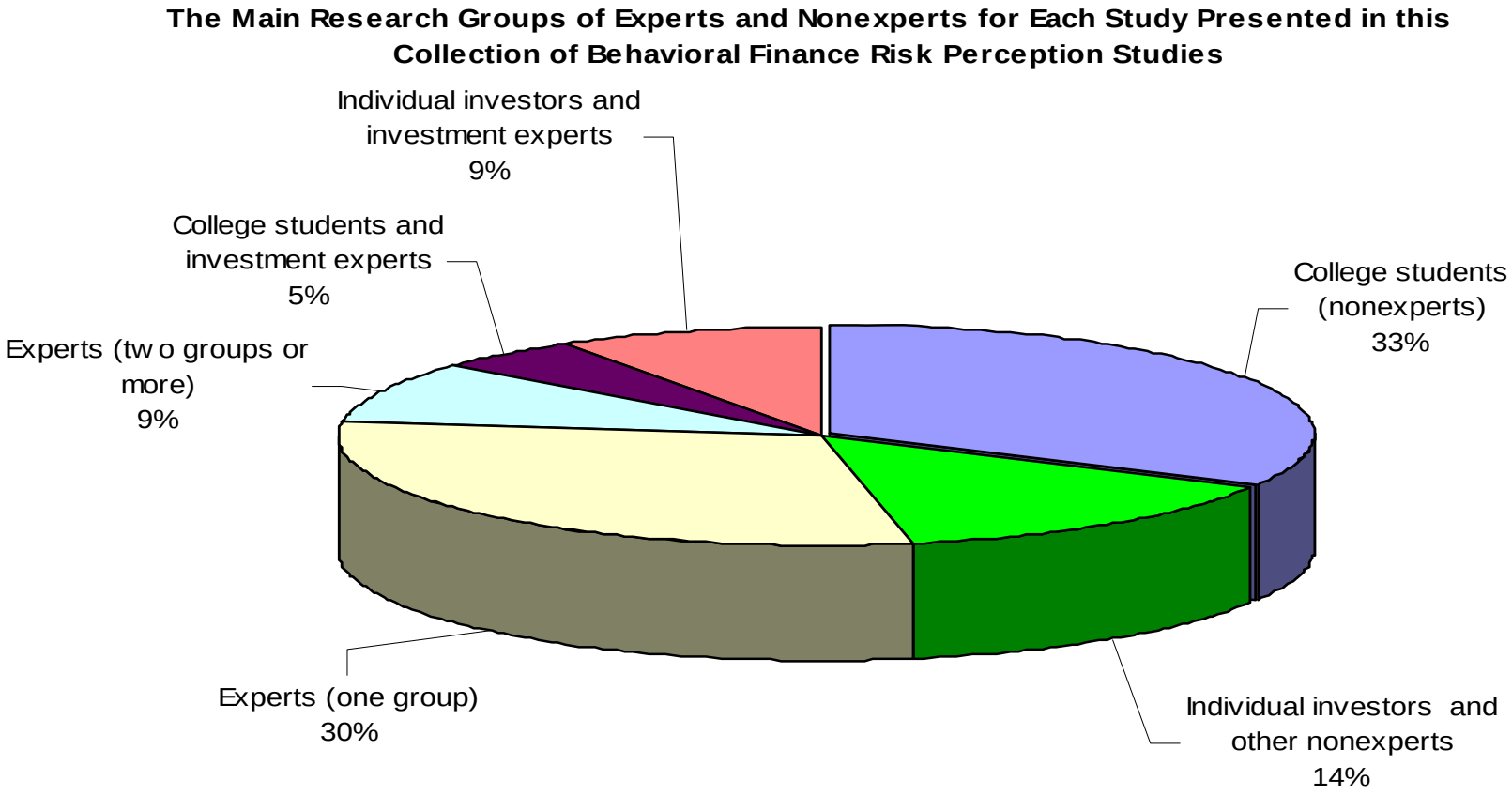
Ricciardi (2004): The basic characteristics and findings of the narrative research reviews from the risk perception literature in behavioral finance

- Selected 71 research endeavors (includes 84 research designs or individual studies) over a time period of 1969 to 2002 from the areas of financial and investment decision making that covered 7 phases of risk perception research.
  - Eliminated approximately 65 endeavors that did not meet my conditions to be considered a *significant contributor* within the risk perception literature.
  - Approximately 10 studies should be considered behavioral economics.
- A strong interdisciplinary perspective is apparent within this collection of studies. In particular, behavioral accounting, behavioral economics, and psychology have a strong foundation within the academic literature. However, there has not been enough replication of research work within the area of risk perception and behavioral finance.
- The three most important requirements for risk perception research to have strong acceptance by standard finance academics are:
  1. A mailed survey to a random sample.
  2. The research group should be professionals/experts.
  3. A large sample size of respondents.

Ricciardi (2004): The basic characteristics and findings of the narrative research reviews from the risk perception literature in behavioral finance

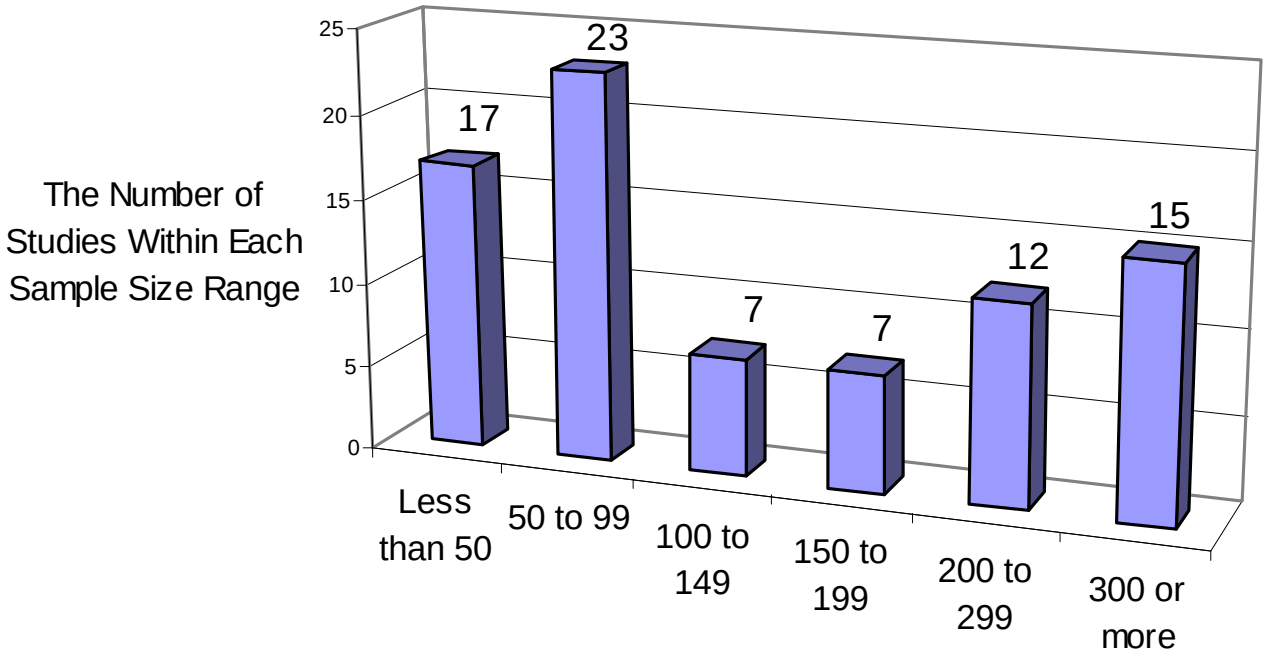


Ricciardi (2004): The basic characteristics and findings of the narrative research reviews from the risk perception literature in behavioral finance



Ricciardi (2004): The basic characteristics and findings of the narrative research reviews from the risk perception literature in behavioral finance

Sample Sizes of Each Study for Subjects and Respondents for the Behavioral Finance Risk Perception Studies



The Six Specific Sample Size Ranges Identified for this Collection of Research Experiments and Studies

Ricciardi (2004): The basic characteristics and findings of the narrative research reviews from the risk perception literature in behavioral finance

- These studies incorporate a wide range of financial and investment tasks to evaluate a person's risk perception.

- This collect of 71 studies encompassed (investigated) a total of 125 proxy
  variable or surrogate factors based on accounting, finance or investment risk measurements.

- These 71 endeavors cover a total of 111 behavioral risk characteristics or issues.

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) 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."

What is your risk tolerance?

- *Risk tolerance* refers to an investor's comfort with the inherent risk in a given type of investment.
- This is also referred to as the "***sleep factor***"- the level of risk an investor can withstand and still be able to sleep at night. You should not invest beyond your risk tolerance.
- Typically, a financial advisor will provide you with a questionnaire and interview to determine your risk tolerance profile.
- There are many different types of risk tolerance questionnaires and asset allocation strategies utilized by investment firms and mutual fund companies.
  - Usually 10 to 25 questions for each risk tolerance quiz.
  - Will calculate a risk tolerance score and identify your risk tolerance category.

What is the role of an individual's demographic characteristics in decision making towards risk?

- The literature in risk taking behavior reveals some well-established findings regarding demographic characteristics:
  1. **Gender**: Men tend to be more risk seeking than women.
  2. **Marital status**: Single individuals tend to make riskier decisions than married persons.
  3. **Age**: Younger persons are inclined to be more risk seeking than older individuals.
  4. **Level of education**: A person with higher levels of education display a greater risk propensity or tendency to take risks.
  5. **Financial knowledge (Experience/Expertise):** Individuals who believe they have more knowledge of risk and risky situations, tend to undertake greater financial risks.

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*.

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?"**

What is the notion of expert knowledge?

- Webster's Dictionary defines knowledge as the “fact or condition of knowing something with familiarity gained through experience or association.”
- What is the“10-Year Rule of Expertise”?
- Factors that might influence the relationship between a person’s level of knowledge and risk perception are: personality traits, their own beliefs, level of expertise, and factual information (i.e. statistics).
- Professional (expert) and novice (non-expert) subjects perceive risk differently based on the type hazard or risky activity and the degree of the riskiness.
- The more individuals perceive an activity as difficult to understand (lack of knowledge) the increased anxiety or fear they have towards it.

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 are the emerging issues within the behavioral finance risk perception literature? My current research study

- My current research study:

  "*What are the similarities and differences between the perceptions toward financial risk for common stocks of academics (finance professors) vs. professional financial advisors (financial planners)?"*

What are the emerging issues within the behavioral finance risk perception literature? My current research study

- **Issue #1: The Potential for an Inverse (Negative) Relationship Between Perceived Risk and Return**

- Investment professionals (Financial Planners) and financial academics (Finance Professors) exhibit a low level of perceived risk and a high perceived return for a common stock investment.

- Investment professionals (Financial Planners) and financial academics (Finance Professors) reveal a high level of perceived risk and a low perceived return for a common stock investment.

What are the emerging issues within the behavioral finance risk perception literature? My current research study

- **Issue #2: The Role of Perceived Trust: Is there a Connection With An Inverse (Negative) Relationship Between Perceived Risk and Return?**

- A high degree of trust by an expert investor results in a lower level of perceived risk and a higher perceived return for a common stock.

- A low degree of trust by an expert investor results in a higher level of perceived risk and a lower perceived return for a common stock.

What are the emerging issues within the behavioral finance risk perception literature? My current research study

- **Issue #3: The Role of "Negative Affect"**

  Gender Bias and Worry

- Female financial experts demonstrate a "greater degree of worry" than male investment experts for common stock investments.

What are the emerging issues within the behavioral finance risk perception literature? My current research study

- **Issue #4: The Significance of Gender and Loss Aversion: Investment Decision-Making: Are Women More Loss Averse Than Men?**

- Female investment experts reveal a higher degree of loss aversion than male financial experts for a common stock investment.

- Female investment experts exhibit a higher degree of concern for downside risk than male financial experts for a common stock investment.

What are the emerging issues within the behavioral finance risk perception literature? My current research study

- **Issue #5: The "White Male Effect" The Role of Perceived Risk, Loss Aversion and Downside Risk For a Common Stock Investment**
- Non-white investment experts reveal a higher level of perceived risk than white financial experts for a common stock investment.
- Non-white investment experts reveal a higher degree of loss aversion than white financial experts for a common stock investment.
- Non-white investment experts exhibit a higher degree of concern for downside risk than white financial experts for a common stock investment.

What are the emerging issues within the behavioral finance risk perception literature? My current research study

- **Issue #6: The Influence of Positive Affect and Expertise: Investing with Intuitive "Gut Feelings "What is the Role of Professional Investment Experience? The "10-Year Rule of Expertise" *For Financial Planners***
- Highly-experienced financial planners (10 years or more) are more intuitive (higher degree of positive affect) than less-experienced financial planners (less than 10 years) in the judgment of a common stock investment.
- Highly-experienced financial planners investors (10 years or more) are less intuitive (lower degree of positive affect) than less-experienced financial planners (less than 10 years) in the judgment of a common stock investment.

What are the emerging issues within the behavioral finance risk perception literature? My current research study

- **Issue #7: The Role of Positive Affect and Gender: The Stereotype of Women's Intuition:**
  Are Women Really More Intuitive Than Men?

- Female expert investors are more intuitive (higher degree of positive affect) than male expert investors in the assessment of a common stock investment.

- Female expert investors are less intuitive (lower degree of positive affect) than male expert investors in the assessment of a common stock investment.

What are the emerging issues within the behavioral finance risk perception literature? My current research study

- **Issue #8: The Role of Familiarity Bias With Perceived Risk and The "Decision to Buy" A Common Stock Investment**
- A higher degree of perceived familiarity by an expert for a financial instrument (e.g., the judgment of a more familiar asset) reveals a lower degree of perceived risk and an increased likelihood of investment (e.g., decision to buy) in a common stock.
- A lower degree of perceived familiarity by an expert for a financial instrument (e.g., the judgment of a less familiar asset) reveals a higher degree of perceived risk and a decreased likelihood of investment (e.g., decision to buy) in a common stock.

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.

My Papers of Reference in Behavioral Finance

Ricciardi, V. (2006). A research starting point for the new scholar: A unique perspective of behavioral finance. *ICFAI Journal of Behavioral Finance,* 3, 3: 6-23.

Ricciardi, V. (2004). A risk perception primer: A narrative research review of the risk perception literature in behavioral accounting and behavioral finance. *Working Paper*.

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

Papers of Reference for this Presentation

Brehmer, B. (1987). The psychology of risk. In W. T. Singleton and J. Howden (Eds.), *Risk and decisions* (pp. 25-39). New York, NY: Wiley.

Finucane, M. L. (2002). Mad cows, mad corn, & mad money: Applying what we know about the perceived risk of technologies to the perceived risk of securities. *The Journal of Behavioral Finance,* 3: 236-243.

Gigerenzer, G., Todd, P. M, and ABC Group. (1999). *Simple heuristics that make us smart*. New York, NY: Oxford University Press.

Gilovich, T. (1981). Seeing the past in the present: The effect of associations to familiar events on judgments and decisions. *Journal of Personality & Social Psychology,* 40, 5: 797-808.

Papers of Reference for this Presentation

MacGregor, D. G., Slovic, P., Berry, M., and Evensky, H. R. (1999). Perception of financial risk: A survey study of advisors and planners. *Journal of Financial Planning*, 12, 8: 68-86.

McDonald, J. G. and Stehle, R. E. (1975). How do institutional investors perceive risk? *Journal of Portfolio Management*, 2, 1: 11-16.

Olsen, R. A. (2001). Behavioral Finance as science: Implications from the research of Paul Slovic. *The Journal of Behavioral Finance,* 2, 3: 157-159.

Slovic, P. (2000). R. Lofstedf. (Ed.). *The perception of risk*. London, UK: Earthscan Publications Ltd.