

Psychology of Money: Its Impact on Risk Tolerance

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Outline

1. Two Theories of Investor Behavior
2. Designing Effective Risk Tolerance Questionnaires
3. Portfolio Selection.

How Rational Are We?

(Part 1)

“Morningstar Ratings Make Difference”

“Financial Research Corp., Boston, has proven that Morningstar’s star system for ranking funds does have a huge influence over the buying behavior of investors....

71% of net sales in 1998 went to 4- and 5-star funds.”

Investment News

How Rational Are We?

(Part 2)

”Morningstar star ratings do not measure how well a fund competes in its asset class, but instead give good marks for any fund that happens to be in an asset class of ascendance... *The laws of reversion to the mean cause the star ratings to have little predictive value.* “

“Morningstar’s Risk Adjusted Ratings”, William F. Sharpe.

1. Two Theories of Investor Behavior

- Standard Finance/Expected Utility Theory
- Behavioral Finance/Prospect Theory

Standard Finance/ Expected Utility Theory

- Markowitz 1952
- Prescriptive
- Now includes CAPM, APT, option-pricing
- Focus on wealth maximization
- If expected values are equal, choose the certain result

Behavioral Finance Recommended Reading

- "The Psychology of Judgment and Decision Making." Scott Plous. McGraw Hill.
- "Dow Jones Asset Management." Nov.-Dec. 1998.

Behavioral Finance/ Prospect Theory

- Tversky
- Descriptive
- Satisficing rather than optimal decisions
- Multifaceted preferences
- Reliance on analogy, intuition, experience, feelings
- Weight evidence inconsistently
- Replaces "net wealth" with "value" (gains/losses from a reference point)

Elements of BF

Framing 1

Choose between A and B:

A: A 50% chance of gaining \$1000.

B: A sure gain of \$500.

Elements of BF

Framing 2

Choose between C and D:

C: A 50% chance of losing \$1000.

D: A sure loss of \$500.

Elements of BF

The Certainty Effect 1

Russian Roulette

Gun A has 4 bullets.

Paying some amount will remove 1 bullet.

Gun B has 1 bullet.

How much would you pay to remove the bullet?

More, less, the same?

Elements of BF

The Certainty Effect 2

Probability of being shot in Case A:

Before payment: $4/6 = 0.67$; After payment: $3/6 = 0.50$. Risk reduction: 0.17.

Probability of being shot in Case B:

Before payment: $1/6 = 0.17$; After payment: $0/6 = 0.00$. Risk reduction = 0.17.

Elements of BF

The Certainty Effect 3

Standard Finance:

Utility of the payment is 0.17 in both cases, so prediction is payment would be the same.

Behavioral Finance:

Predicts people would much rather *eliminate* risk than *reduce* it since in BF small probabilities are overweighted.

Other Elements of BF

- Pseudocertainty
- Regret Theory

Conclusion

- BF/PT provides a more accurate description of how people actually make decisions.
- BF/PT represents a great improvement over SF/EUT.

Some Reasons

- Evolution
- Humans designed to deal with wide range of problems
- Shared beliefs
- Genetic and biological causes

What Can You Do?

- Get training in statistics and intuitive decision procedures.
- Take broad view: Aggregate wealth.
- Don't compartmentalize.
- Understand luck and skill often indistinguishable.
- Identify your own inclinations.

Investment Implications

- Higher volatility
- Herding
- Selling winners early, losers late
- Mistaking good/bad cos. for good/bad investments
- IPO performance

2. Designing an Effective Risk-Tolerance Questionnaire

Use computer technology to integrate investment theory, psychometrics and behavioral finance.

Questionnaire Design

Do...

Employ psychometrics and behavioral finance:

- Incorporate Prospect Theory.
- Incorporate myopic loss aversion.
- Consider framing of questions.
- Ensure response consistency.

Questionnaire Design

Do...

- Consider the entire portfolio.
- Use wealth scaling.

*Would you accept the following investment with
\$ $\langle \text{PctWealth} * \text{Wealth} \rangle$ of your investable funds?*

*Double your investment with 50% probability, or lose
the entire investment with 50% probability.*

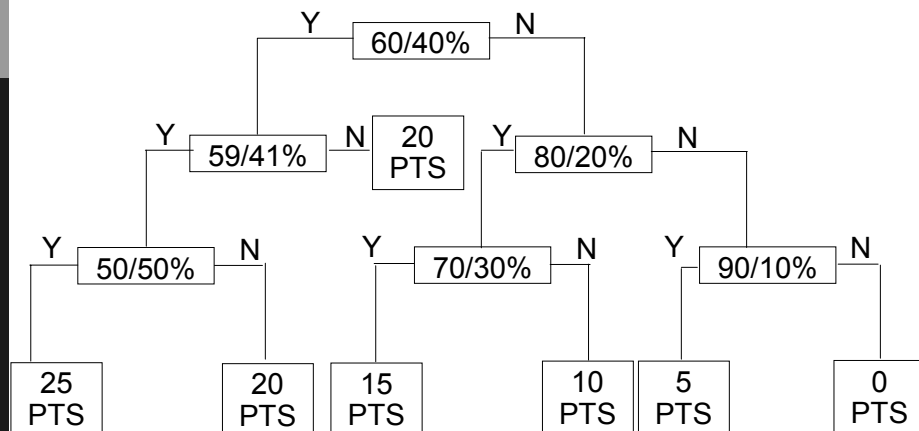
- Yes
- No

Questionnaire Design

Do...

Use adaptive questions

Would you place 5% of your assets in an investment with the following chances of doubling/total loss?



Questionnaire Design

Don't...

Assume risk=losing money.

I would only select investments where it is unlikely I will lose my original investment

Questionnaire Design

Don't...

Assume that asking individuals about their risk preferences can provide meaningful information.

Which of the following statements best describes your feelings about investment risk?

- I would only select investments that have a low degree of risk.
- I prefer investments with emphasis on those with a low degree of risk and a small portion in others that have a higher degree of risk that may yield greater returns.
- I prefer to select a balanced mix of investments -- some with a low degree of risk, others will have a higher degree of risk that may yield greater returns.
- I prefer to select an aggressive mix of investments -- some that have a low degree of risk, but with emphasis on others that have a higher degree of risk that may yield greater returns.
- I would select an investment that has only a higher degree of risk and a greater potential for higher returns.

Questionnaire Design

Don't...

Confuse the long-term investment strategy
with day-to-day cash flow issues

I find it easy to pay my monthly bills from my current pay.

- I strongly disagree
- I disagree
- I somewhat agree
- I agree
- I strongly agree

Questionnaire Design

Don't...

Make assumptions about the relationship between past behavior and risk tolerance

Have you ever invested in individual stocks or stock mutual funds?

- No, and I would be uncomfortable with the risk if I did.
- No, but I would be comfortable with the risk if I did.
- Yes, but I was uncomfortable with the risk.
- Yes, and I felt comfortable with the risk.

Which of the following activities have you participated in?

- Sky-diving.
- Race-car driving.
- Gardening.
- Jogging.

Questionnaire Design

Benefits of Computerization

- Customization of questionnaires.
- Response consistency.
- Wealth scaling.
- Sensitivity analysis.
- Feedback.
- Reporting.
- Electronic delivery.

3. Portfolio Selection

- Identify the investment horizon
- Identify the investment goal.
- Use questionnaire to get risk-tolerance score
- Identify portfolios
- Portfolio-selection techniques:
 - Absolute mapping
 - Relative mapping