

BeFi»2008

TOPIC SEVEN

**Measuring Risk Perception
and Risk Attitude in the Domain
of Financial Investing**

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Measuring Risk Perception and Risk Attitude in the Domain of Financial Investing

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Understanding Investor Risk Taking

- ✓ Of interest to both investment industry and government regulators (SEC)
 - ✓ Informing about risks
 - ✓ Informed consent on investment decisions requires adequate understanding of risks and risk taker and effective communication
 - ✓ Explicit legislation in European Union (Markets in Financial Instruments Directive (MiFID))
 - ✓ Similar SEC and House Financial Services Committee Hearings on investor protection
 - ✓ Matching risk-attitudes
 - ✓ Clients and financial advisors
 - ✓ Understanding and perhaps modifying behavior
 - ✓ Making female or less-affluent pension investors less risk averse?

Investor Risk Taking: Let's Apply Lessons from Yesterday

- ✓ Predicting behavior
 - ✓ People do seem to make informal risk—return tradeoff decisions in investment domain
 - ✓ Perceived benefits often correspond to EV of returns
 - ✓ Perceived risks rarely correspond to Variance of returns
- ✓ Who takes (more) risks and why?
 - ✓ Stable individual differences in perceived-risk attitude exist
 - ✓ Probably with same age and possibly gender effects as sensation-seeking
 - ✓ But, also people who perceive risks to be smaller (all other things being equal) look like they take more risks

Assessing Risk Taking Profile of Investors

- ✓ Multiple measures required
 - ✓ For psychophysical risk—return model, a minimum of three variables
 - ✓ Perceived return
 - ✓ Perceived risk
 - ✓ Attitude towards perceived risk
 - ✓ **DoSpeRT scale** (Weber, Blais, Betz, 2002; Blais & Betz, 2006) provides a way to obtain these estimates
 - ✓ Five (or six) domains of risky decisions
 - ✓ Financial subscale items subdivided into gambling and investing items

DoSpeRT Scale

(Weber, Blais, Betz, 2002):

- ✓ Translated and validated in English, German, Dutch, Spanish, French, Hungarian, and Mandarin
 - ✓ Has response measures that assess risk taking, perception of risks and benefits for domain-specific behaviors, and allow for (statistically) inferring perceived-risk attitude

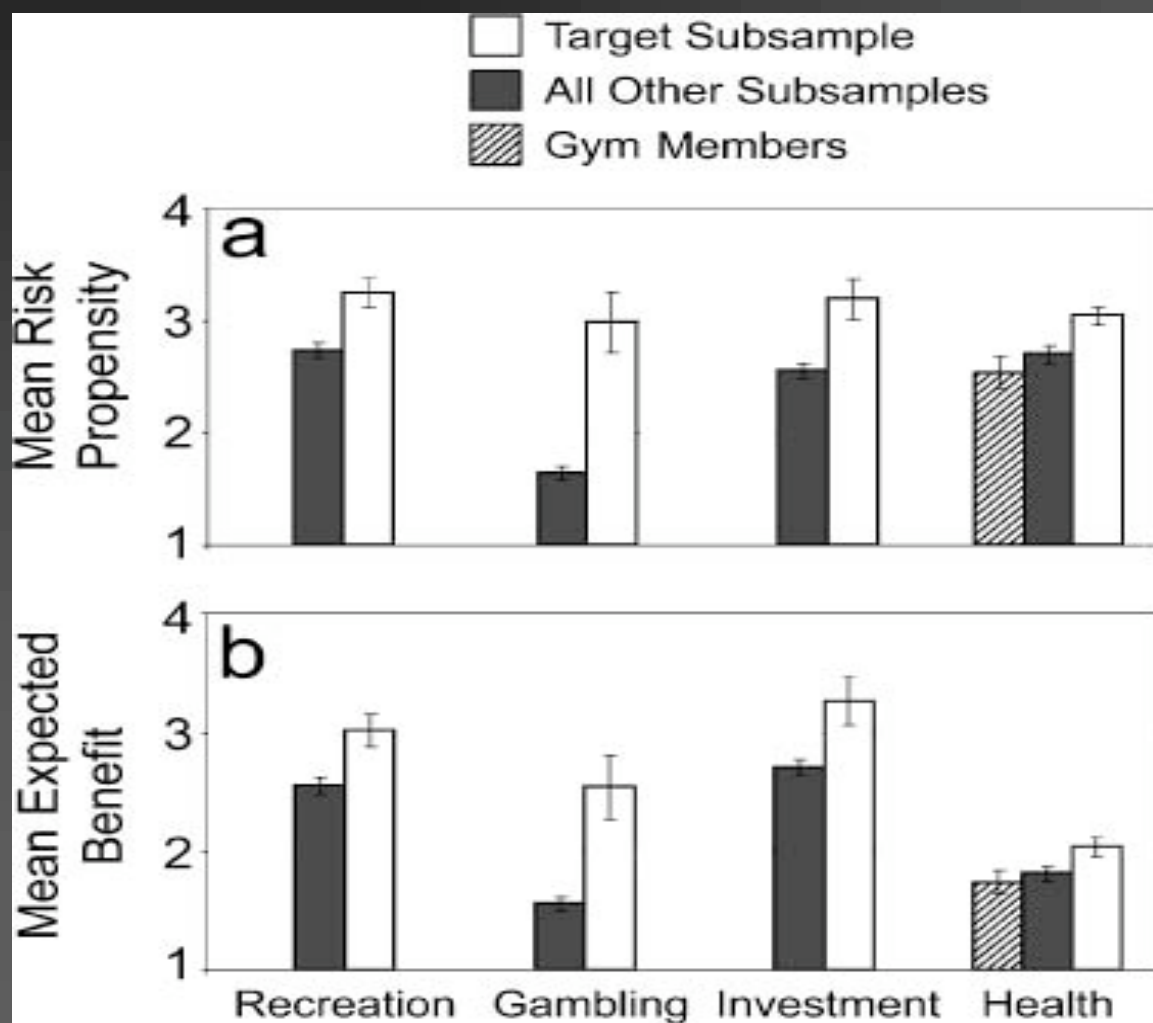
 - ✓ Review of measures of risk propensity in healthcare decisions describes DOSPERT scale as one of three “relevant to a clinical environment as they directly measure risk propensity across a number of everyday situations” (Harrison, Young, Butow, Salkeld, & Solomon, 2005)

 - ✓ DOSPERT
 - ✓ Health/safety and recreational subscales predict blood alcohol concentrations in Mexican highschool students (Zuniga & Bouzas, 2005)
 - ✓ Content-appropriate subscales predict real world risk taking (Hanoch et al., 2006)
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PROPOSAL Today

- √ To improve on existing financial/investment risk-taking subscale!
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Develop items for new/expanded Investing scale and validate them in way done by Hanoch et al. (2006)



Recreation targets
bungee jumpers
hang gliders
scuba divers

Gambling targets
casino gamblers

Investment targets
stock-trading clubs

Health targets
smokers
gym members

DoSpeRT Scale (Weber, Blais, Betz, 2002): Existing Financial Subscale Items

✓ Gambling Items

- ✓ Betting a day's income at the horse races.
- ✓ Betting a day's income at a high-stake poker game
- ✓ Betting a day's income on the outcome of a sporting event.
- ✓ **Gambling a week's income at a casino.**

✓ Investment Items

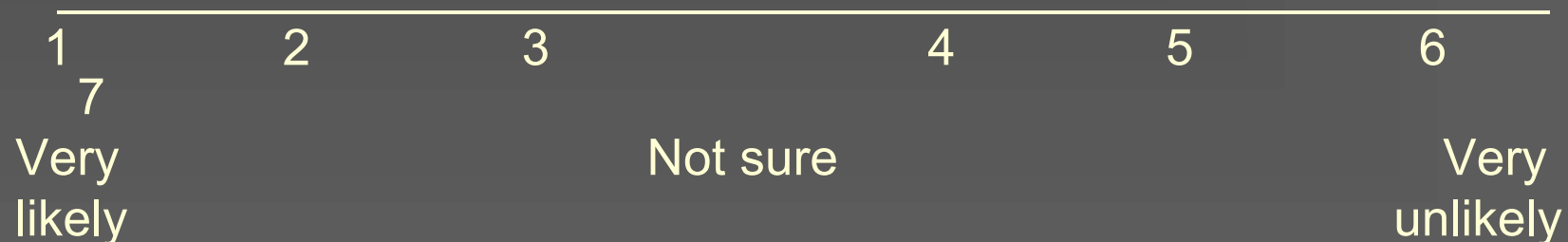
- ✓ Investing 5% of your annual income in a very speculative stock.
- ✓ Investing 10% of your annual income in a moderate growth mutual fund.
- ✓ Investing 10% of your annual income in a new business venture.
- ✓ **Investing 5% of your annual income in a dependable and conservative stock.**

✓ *Bold items omitted from 2006 shortened version*

DOSPERT Risk Taking Scale

- For each of the following statements, please indicate the **likelihood** that you would engage in the described activity or behavior, if you were to find yourself in that situation.

Please indicate your **likelihood** of engaging in each activity or behavior. Provide a rating from **1 to 7**, using the following scale:



DOSPERT Risk Perception Scale

- People often see some risk in situations that contain uncertainty about what the outcome or consequences will be and for which there is the possibility of negative consequences. However, riskiness is a very personal and intuitive notion, and we are interested in **your gut level assessment of how risky** each situation or behavior is.

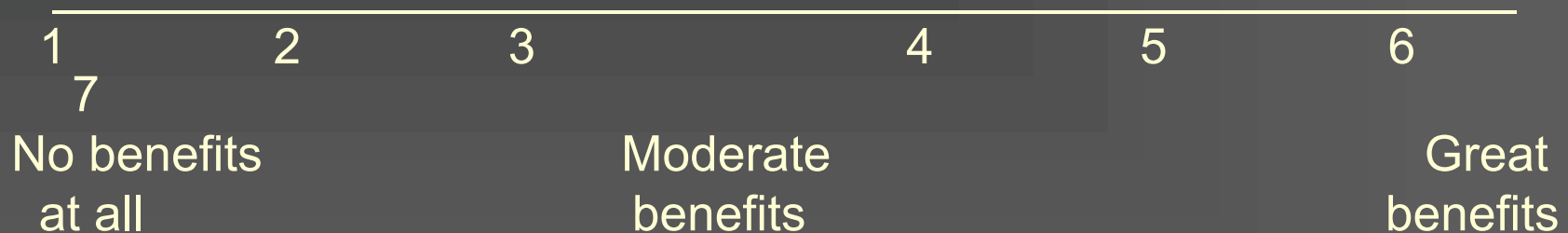
For each of the following statements, please indicate **how risky you perceive** each situation. Provide a rating from **1 to 7**, using the following scale:



DOSPERT Expected Benefits Scale

- √ For each of the following statements, please indicate the **benefits** you would obtain from each situation.

Provide a rating from **1 to 7**, using the following scale:



DOSPERT

Regression of Risk taking

- √ *Willingness-to-take*(X) =
 $a(\text{Expected Benefit}(X)) + b(\text{Perceived Risk}(X)) + c$
 - √ Perceived-risk attitude (PRA), b
 - √ If significantly $b < 0$, perceived-risk averse
 - √ If $b = 0$, perceived-risk neutral
 - √ If significantly $b > 0$, perceived-risk seeking
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Expanded Financial Investment DOSPERT subscale

- √ What items to include?
 - √ How to present investment options?
 - √ What preference measure to use?

 - √ Answers to these questions depend on purpose for scale
 - √ What would investment firms like to know about their investors?
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Some lessons from

Weber, Siebenmorgen, M. Weber (2005)

√ Communicating asset risk

- √ How name recognition and the format of historic volatility information affect risk perception and investment decisions

- √ Business students at Ohio State (n=120) and U of Mannheim (n = 120) provided with

- √ Names of 16 domestic and foreign investment options
 - √ 1-year return information (in two formats)
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Example Display of Investment Option from Weber, Siebenmorgen, M. Weber (2005)

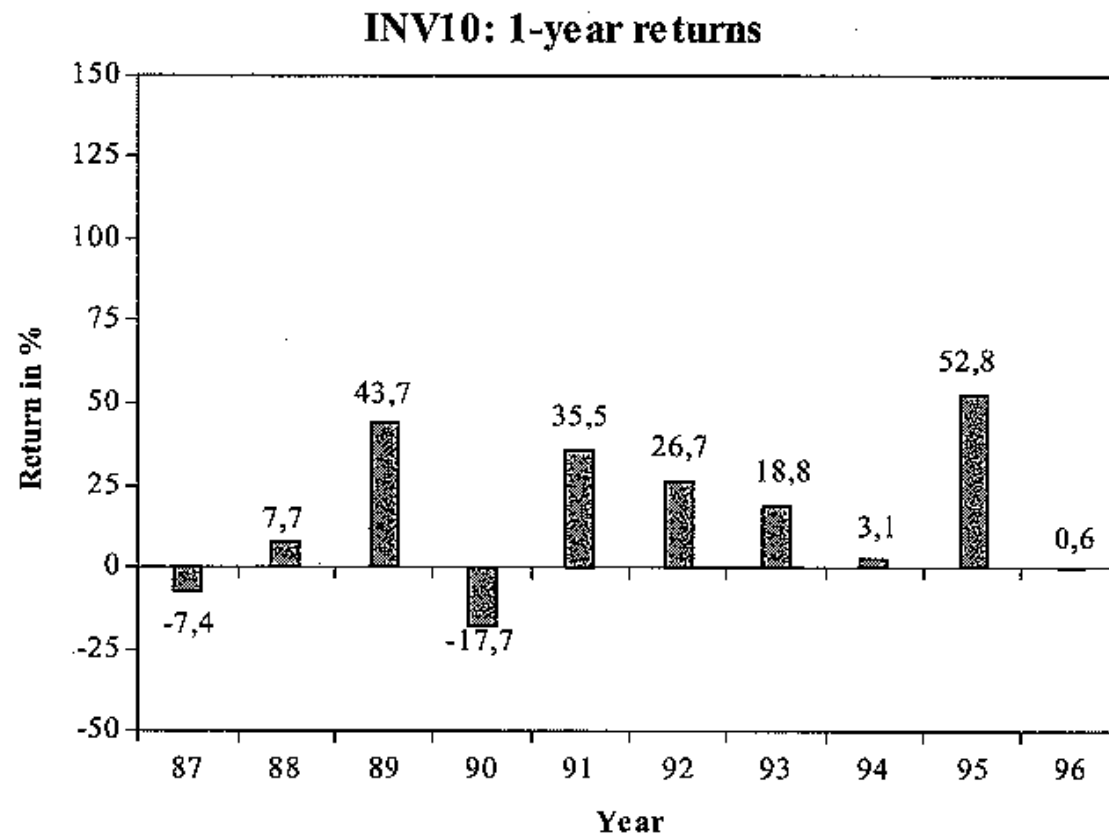


Fig. 1. Ten-year investment returns of an investment option in condition R-, presented in a historical time series.

Example Display of Investment Option from Weber, Siebenmorgen, M. Weber (2005)

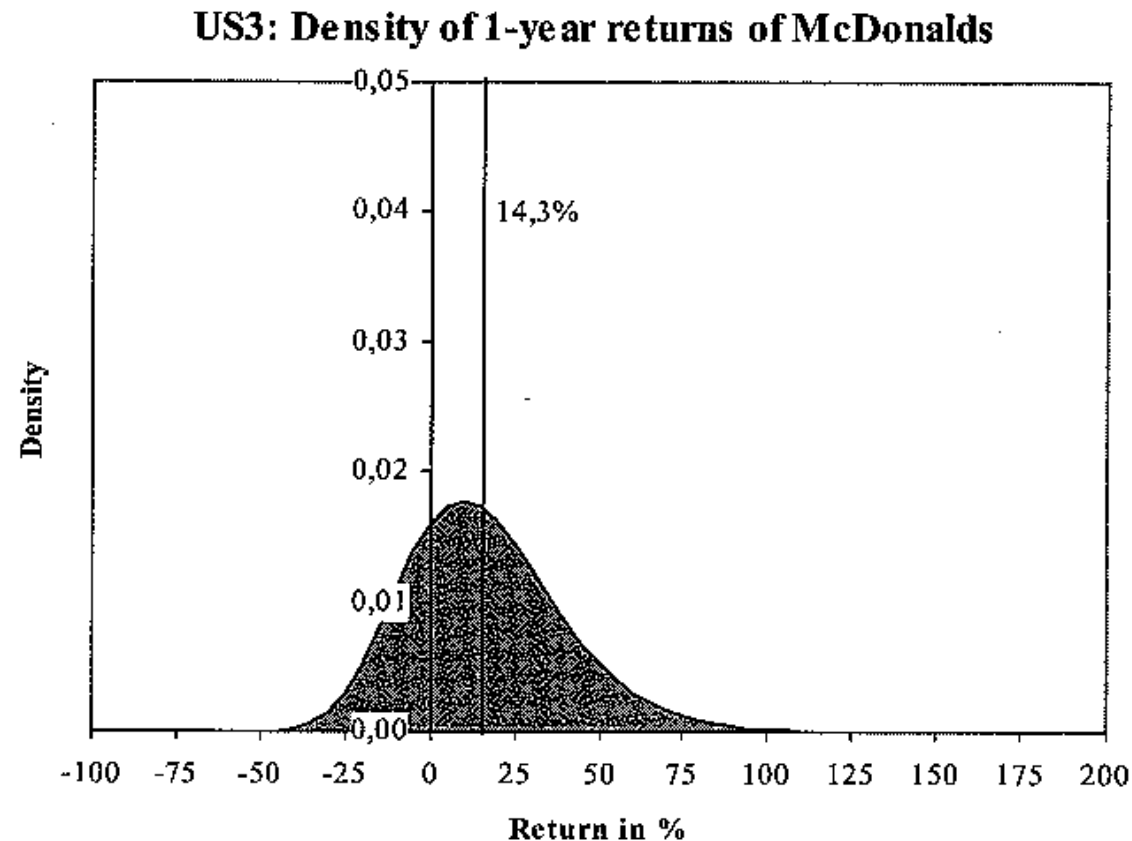


Fig. 2. Ten-year investment returns of an investment option in condition D+, presented as a continuous probability density function.

- √ Dependent measures collected for each investment option
 - √ Predicted median, 10th, and 90th percentile of expected return
 - √ Perceived riskiness (on scale from 1 to 9)

- √ Expected return = Median
- √ Expected volatility, estimated from 3-point approximation of Pearson and Tukey (Keefer & Bodily, 1983)

Results relevant for proposed scale development (Weber, Siebenmorgen, M. Weber, 2005)

- √ Expected returns
 - √ Closely related to historical returns
 - √ Knowing asset names increased return expectation
- √ Expected volatility
 - √ Closely related to historical volatility
 - √ Greater estimates for smoothed density distribution condition
- √ Perceived Risk
 - √ Historical volatility less of a predictor
 - √ No effect of past return information display condition
 - √ Variables that cause affective reactions had strong effects
 - √ Having asset names reduced perceived risk
 - √ Home bias: Domestic investment options had reduced risk perception
 - √ Familiarity effect: More familiar stocks judged to be less risky

✓ Asset Allocation

- ✓ Minimum of one, maximum of five (out of 16 options) allowed
 - ✓ Mean number of options chosen = 3.9
 - ✓ Allocation to option ranged from 2% to 100%, with mean of 25% (Naïve diversification, Benartzi & Thaler, 1998; Siebenmorgen & M. Weber, 2000)
- ✓ Perceived risk and expected return 5-times better in predicting choice than expected volatility and expected return

Proposed Measures

- √ Preference
 - √ Willingness to pay? Asset Allocation decisions?
 - √ Risk perceptions, perceptions of benefits
 - √ From previous two, statistically infer true “attitude” towards risk
 - √ Other variables
 - √ Familiarity with investment options
 - √ Worry, concern about investment option
 - √ Decreasing marginal utility for money
 - √ Loss aversion
 - √ Probability weighting
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Investor groups to target in tests

- √ 401k investors
 - √ Examine effects of gender
 - √ Examine effects of income level, wealth
 - √ Does gender or wealth affect risk-taking via
 - √ Expectations of risks and returns
 - √ Rational components of these evaluations
 - √ Emotional/affective components of these evaluations
 - √ Attitude towards risk; risk—return tradeoffs
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