

Dynamic Strategic Planning

Utility Functions

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Example

- **A Simple Game:**

I Am Ready to Give Away _____ On A Toss
Of A Coin

If Heads, I Give Away; _____ If Tails, I Keep
Money

Probability of Heads = 50%

Expected Value = _____

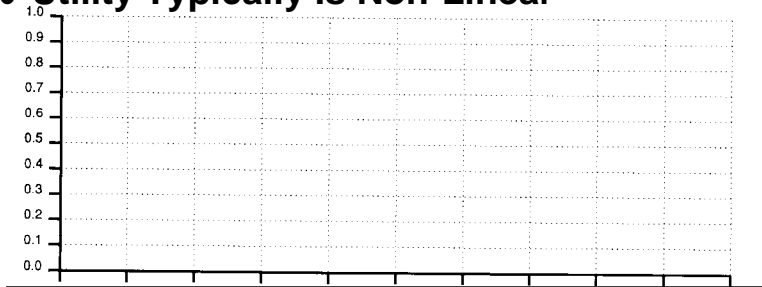
How Much Would You, Individually, Pay Me
For The Opportunity To Play This Game?

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Interpretation of Example

- Averages Clearly Not The Basis For Most People's Choice
- People Decide on the Basis of "Real Value" \equiv Utility
- Utility Typically Is Non-Linear



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Interpretation of Example (cont'd)

- Utility Depends on Many Factors
- Utility is Measurable

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Notion of Utility

- A Transformation of Outcomes, X , To Define Their "Real Value" = Utility $U(X)$
- People Decide
 - Not On Expected Values
 - Rather, On Expected Values of $U(X)$
- To Understand a Situation
 - Transform All X -----> $U(X)$
 - Do Expected Value Calculations on $U(X)$
- Note:
 - Utilities Are Personal

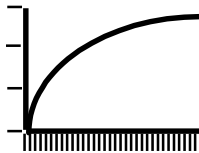
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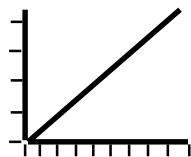
Some Conventional Definitions

Unfortunately, Terms Can Be Misleading)

- Risk Aversion
Risk Averse if X is Preferred to a Lottery Whose Expected Value is X



- Risk Neutral

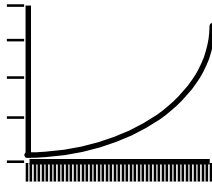


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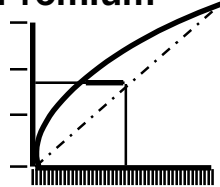
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Some Conventional Definitions (cont'd)

- Risk Positive (Preference, or Prone!)



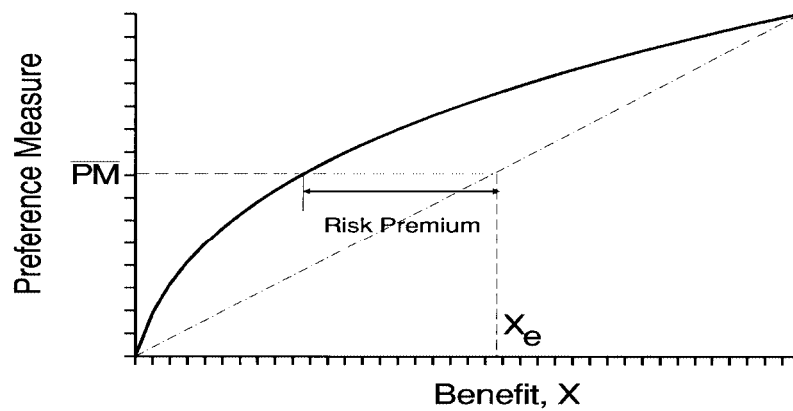
- Risk Premium



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Representation of "Risk Averse" Behavior



- Semantic Caution

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Utility Function - U(X)

- **Definition:**

**U(X) Is A Special V(X),
Defined In An Uncertain Environment**

- **It Has A Special Advantage**

**Units of U(X) Do Measure Relative Preference
Can Be Used In Meaningful Calculations**