

Econ 30010  
**Intermediate Microeconomic Theory**

**Risk Summary and Outline**

So far we have studied how prices, income, and preferences affect consumer choices. This analysis assumed that we could assess the outcome of all our decisions with certainty. In reality, the outcome of many choices we make are uncertain at the time the choices are made. When you buy a lottery ticket, you hope but do not know if it is a winning ticket. When you invest in the stock market, you do not know what will happen to stock prices in the future. Research may suggest that a given company's stock will go up or it may suggest the likely range in which a stock's price will fall over the next week, or 6 months, or 3 years. Most Notre Dame students expect the football team to go to a good bowl game in their senior year but regrettably that too is not guaranteed.

When you have to make a decision in which the outcome is uncertain, the risk associated with this uncertainty can influence the choices you make. In order to understand how risk influences the choices people make, we need to develop a way to describe and quantify the risk associated with any decision problem. The main approach used in economics is *Expected Utility Theory*. We will use expected utility theory to evaluate the cost of risk to an individual and to study how to make decisions when risk is present.

**Outline**

- I. Modelling uncertain outcomes - Using probability concepts.
- II. Expected utilities - The main method for incorporating risk into decision problems.
- III. Making decisions under uncertainty and managing risk - We will look at how risk affect individual decisions and how risk can be managed or traded.

**Key Concepts and Ideas**

- Decision problems that involve uncertain events can be described using **lotteries** and probabilities.
- The riskiness of a decision can be described in terms of the **expected value** and the **variance** of the outcomes.
- For someone who is averse to bearing risk, the best option is the one that maximizes the person's **expected utility**.
- Expected utility allows one to calculate a **certainty equivalent** or guaranteed outcome that is equivalent in utility terms to an uncertain outcome.
- The difference between the expected value of a decision and its certainty equivalent is the **risk premium**. The risk premium measures the cost of the risk to an individual from making a choice that has an uncertain outcome.

**Important Skills**

- Describe a choice associated with an uncertain outcome using the concept of a lottery.
- Calculate the expected value and variance of a lottery.

- Compare two lotteries to determine which may involve more risk.
- Calculate the expected utility, certainty equivalent, and risk premium of a lottery.  
Understand how to use this information to choose between several options that may involve uncertain outcomes.
- Explain how and why people might trade risk.