FN241 class 1-3 review questions

Provide precise and concise responses to the following questions referring to theories, concepts, and frameworks as discussed in the class materials and the main textbook. For quantitative problems, demonstrate the process of calculation and clearly highlight your answers as appropriate. Write down your answers clearly so that the lecturer can read them easily.

Review questions

1. Explain the difference between pure risk and speculative risk
   Pure risk is defined as a situation in which there are only the possibilities of loss or no loss. *Speculative risk* is defined as a situation where either profit or loss is possible.

2. How does diversifiable risk differ from non-diversifiable risk?
   Diversifiable risk is a risk that affects only individuals or small groups and not the entire economy. It is a risk that can be reduced or eliminated by diversification. In contrast, *non-diversifiable risk* is a risk that affects the entire economy or large numbers of persons or groups within the economy. It is a risk that cannot be reduced or eliminated by diversification.

3. Identify the approaches that insurers can use to deal with the problem of catastrophic loss exposures.
   Insurers can deal with the problem of a catastrophe loss by (1) reinsurance, (2) avoiding the concentration of risk by dispersing coverage over a large geographical area, and (3) use of certain financial instruments in the capital markets, such as catastrophe bonds.

Application questions

1. Risk managers use a number of methods for managing risk. For each of the following, what method for handling risk is used? Explain your answer.
   a. The decision not to carry earthquake insurance on a firm's main manufacturing plant
   b. The installation of an automatic sprinkler system in a hotel
   c. The decision not to produce a product that might result in a product liability lawsuit
   d. Requiring retailers who sell the firm's product to sign an agreement releasing the firm from liability if the product injures someone

   (a) *Retention*. The firm is retaining the earthquake exposure.

   (b) *Risk control*. If a fire occurs, the sprinkler system will operate automatically to extinguish the fire, thereby reducing the size of the loss.

   (c) *Avoidance*. The firm is avoiding a lawsuit by not manufacturing products that could injure customers who use the product.

(d) *Noninsurance transfer*. The firm manufacturing the product has transferred the risk of a liability suit to the retailers by such an agreement. This agreement is often called a hold-harmless agreement. For example, a manufacturer may insert a hold-harmless clause in a contract with a retailer by which the retailer agrees to hold the manufacturer harmless if a scaffold collapses and someone is injured.

2. Compare the risks of (i) fire with (ii) war in terms of how well they meet the requirements of an ideally insurable risk.

   (i) Risk of fire
   a) Large number of exposure units. This is generally met, since there are millions of homes
   b) that are insured.
   c) Accidental and unintentional loss. This requirement is generally met, since most insureds do not deliberately start a fire.
   d) Determinable and measurable loss. A fire loss can be determined and measured. In case of disagreement, a property insurance policy has a provision for resolving disputes.
   e) No catastrophic loss. This requirement is met, since most homes do not burn at the same time.
   f) Calculable chance of loss. Insurers can estimate within ranges the probability of a fire loss.
   g) Economically feasible premium. For most insureds, this requirement is fulfilled.

   (ii) Risk of war
   a) Large number of exposure units. This requirement is not fulfilled. Based on the law of large numbers, it is difficult to estimate accurately the number of wars that will occur.
   b) Accidental and unintentional loss. This requirement is not met. Most wars are not accidental, but intentional.
   c) Determinable and measurable loss. Although a war loss can be determined, the measurement of loss would be difficult.
   d) No catastrophic loss. This requirement is not fulfilled, since large numbers of exposure units would simultaneously incur losses.
   e) Calculable chance of loss. This requirement cannot be easily met.
   f) Economically feasible premium. Because of the catastrophic potential of war, the premiums would not be economically feasible.

3. The risk manager of an oil company decides to install camera surveillance systems at several of the “problem” service stations at a cost of $85,000 per system. The risk manager expects each surveillance system to generate an after-tax net cash flow of $35,000 per year for 3 years with no terminal values. Assuming an interest rate of 8.5%, what is the NPV of this project? What is the project’s IRR? Do NPV and IRR indicate that this project is acceptable?
   NPV = 4,391, IRR = 11.4%
   Both NPV and IRR indicate that we should accept this project as NPV is greater than zero and IRR is greater than the assumed discount rate.

4. RST Company has production facilities in Salt Lake City and Cleveland. The probability that in any given year a fire will damage the production facility in Salt Lake City is 5 percent. The probability that in any given year a fire will damage the Cleveland production facility is 4 percent.
    a. What is the probability that BOTH production facilities will be damaged by fire in any given year?
    b. What is the probability that AT LEAST ONE of the production facilities will be damaged by fire in any given year?
    a. 5% x 4% = 0.2%
    b. 5% + 4% - (5%x4%) = 8.8%