LRM Practice Questions

TIA Practice Question (6 points = 18 minutes)

Your company purchases a 10-year zero issued by XYZ Inc., which yields 4% to maturity.

You may assume that the exposure on the bond is approximately normally distributed with a drift of $\mu = 0\%$ per annum and $\sigma = 10\%$ per annum

(a) (.5 points) Define wrong-way risk.

(b) (1 point) If XYZ Inc. is less likely to default when the exposure is low, is this an example of right-way risk or wrong-way risk? Jusify your answer.

(c) (1.5 points) Suppose XYZ company as a whole is exposed to substantial risk if interest rates drop. If the bond pays a fixed rate, is this an example of right-way or wrong-way risk? Justify your answer.

(d) (1 points) Calculate PFE (99%), the level at which the exposure would be exceeded with a probability of no more than 1%. You may assume that the time period is over the next two years.

(e) (1 point) State two differences between Potential Future Exposure (PFE) and Value-at-Risk (VaR).

(f) (1 point) Suppose that a credit default swap (CDS) is purchased to get insurance on the bond in case of default. Is this an example of right-way or wrong-way risk?

TIA Practice Solution

(a) (.5 points) Define wrong-way risk.

- **Solution:** An unfavorable dependence between exposure and counterparty credit quality

(b) (1 point) If XYZ Inc. is less likely to default when the exposure is low, is this an example of right-way risk or wrong-way risk? Jusify your answer.

- **Solution:** Wrong-way risk. Exposure is high when default risk is high, which is a bad thing. This is an example of wrong-way risk.

(c) (1.5 points) Suppose XYZ company as a whole is exposed to substantial risk if interest rates drop. If the bond pays a fixed rate, is this an example of right-way or wrong-way risk? Justify your answer.

- **Solution:** If interest rates drop, then **both** of the following occur:
  * Increased exposure on the fixed rate bond (since interest rates $\downarrow \Rightarrow$ exposure $\uparrow$)
  * Decreased credit quality (since XYZ is exposed to interest rates dropping)

- Since exposure is increased when credit quality is lower, this is an example of wrong-way risk

(d) (1.5 points) Calculate PFE (99%), the level at which the exposure would be exceeded with a probability of no more than 1%. You may assume that the time period is over the next two years.

$$PFE = \mu + \sigma\Phi^{-1}(\alpha) = \underbrace{10\% \cdot \sqrt{2}}_{\sigma} \cdot 2.326 \approx \boxed{32.9\%}$$

(e) (1 point) State two differences between Potential Future Exposure (PFE) and Value-at-Risk (VaR).

Solution:

1. PFE is defined at more than one future date
2. Represents gains (exposure) rather than losses

(f) (1 point) Suppose that a credit default swap (CDS) is purchased to get insurance on the bond in case of default. Is this an example of right-way or wrong-way risk?

This is an example of **wrong-way risk**. A CDS typically only pays out if the economy is in a weak state, because XYZ Inc would need to default on its payments. Therefore, the counterparty selling the CDS insurance would likely have a weaker credit quality when the CDS pays off. Therefore, this is an example of wrong-way risk.