

CA FINAL

RISK MANAGEMENT

IN-HOUSE

CASE STUDY SERIES

-By Sanjay Saraf Sir

Case Study 25 Answer

Powered By -



Multiple Choice Questions

Answer

1. Answer B.
2. Answer D.
3. Answer A.
4. Answer B.
5. Answer A.

Descriptive Questions

Answer

6. Under the historical observations method, simulations express the distribution of portfolio returns as a bar chart or histogram of hypothetical returns. Each of the returns is calculated to see what the returns would be at today's prices, had market prices or rates repeated themselves.

For calculation, the last 100 or 200 changes in the prices or market rates in the past are collected and plotted into the present set of rates or prices. The period for which historical data is collected is called the Lookback period. The outcome is used to revalue the portfolio. From the generated distribution, the 99% or 97.5% confidence level is selected depending on the level of confidence desired. If the level assumed is 99%, the second largest fall in value is taken for calculation and if the 97.5% level is assumed, the fifth largest fall in value is used. These falls in value are used in the current portfolio to achieve the projected next day's value of the portfolio, with the second or fifth largest expected loss. The projected loss is taken as the VaR for the daily value changes. Usually, the 95th to 99th percentiles are used for VaR calculations.

In order to extend the daily VaR to a longer time horizon, say, one year, the one day figure is multiplied by the square root of number of working days in the year (usually 250 days). The square root is taken, as risk by itself is assumed to be a standard deviation measure. So, in simple words, the one day's figure of VaR is multiplied by 15.8 (the square root of 250 days) to get the annual VaR.

7. **The following guidelines should be kept in mind while managing fixed income portfolio:**
- Duration Bands that are constrain the magnitude of directional interest rate bets, for instance, 'the duration gap between the portfolio and its benchmark should be no more than one year in absolute value' or 'the duration gap

between the portfolio and its benchmark should not exceed 20% of the benchmark's duration'.

- Security selection, which defines the types of securities that can be owned in the portfolio. Guidelines of this type include various restrictions on shorting securities, investing in certain classes of derivative instruments, emerging markets, or high yield debt. They may also include constraints with respect to credit quality, prepayment and volatility risk, etc.
 - Asset allocation limits, such limits are imposed to various issue and issuer-specific constraints, for example, no more than 5% of the portfolio's equity should be invested in single security or the maximum percentage allocation to asset-backed securities cannot exceed 10% of the portfolio's net asset value.
 - VAR constraints, if VAR for the portfolio is not properly taken into account may lead to excessive transactions and even losses. So there should be some compliance rules in terms of value-at-risk.
8. There are two types of risks while holding an investment, namely market risk or systematic risk and individual firm specific risk or unsystematic risk. While the unsystematic risk can be controlled by having a well diversified portfolio, the systematic risk cannot be diversified and affects each and every industry to some extent. Systematic risk can, however, be measured and hedged with the help of futures contracts.

The following is the formula to calculate Beta (or measure of systematic risk):

$$\text{Beta} = \text{cov}(R_i, R_m) / \text{Var}(R_m)$$

Where, R_i = Return on stock i

R_m = Return on market portfolio

Let us now try to understand the hedging with futures contracts.

Consider the case of an investor who feels that a particular stock is undervalued. Based on this understanding he takes a long position of Rs.200,000 in the stock. When doing this, he is faced with two kinds of risks:

1. Either his understanding itself may be wrong.
2. The market as a whole moves against him, resulting in losses being incurred.

The second outcome happens most of the time. If after a few days, the index drops resulting in a general decline in stock prices, the investor makes losses in spite of the fact that his understanding of the stock was correct. It should be

noted that every long position on a stock is a long position on the index as well. This means that Long stock is actually Long stock + Long index.

In order to hedge his position, the investor simply sells the index futures contract. By doing so, he is said to have hedged away his index exposure. This strategy would result in the investor taking a position on the individual stock alone.

In order to determine the number of futures he has to sell, the beta of the stock should be known. The beta of the stock is the average impact of a 1 percent move of the index upon the stock.

For example, a stock with a beta of 1.2 moves by 1.2 percent average when the index moves by 1 percent. Assuming that the beta of stock is 1.2, the size of the position that the investor needs to hedge his index exposure is $1.2 \times 2,00,000 = 2,40,000$.

Now assuming that the index is at 1200 and the market lot for futures contract is 100, he will have to sell 2 index futures contracts.

Once he does this his position will be as follows:

Long stock : 2,00,000

Short index futures : 2,40,000

This position will reflect price changes intrinsic to the stock alone.