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CA FINAL

RISK MANAGEMENT

IN-HOUSE

CASE STUDY SERIES

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Case Study 19 Answers

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Multiple Choice Questions

Answer

1. **C is correct.**

   The delta, or slope, of a linear derivative must be constant (the delta of a nonlinear derivative changes for different levels of the underlying factor). The delta does not necessarily equal to one. A forward contract is an example of a linear derivative. The value of the call option does not change at a constant rate with the change in the value of the underlying stock.

2. **C is correct.**

   Stress testing can serve as an early warning sign of upcoming pressures and risks. The board of directors can take actions that include adjusting capital levels, increasing liquidity, adjusting risks, or engaging in or withdrawing from certain activities.

   The board of directors has ultimate oversight responsibility and accountability for an entire institution. Senior management is responsible for implementing authorized stress-testing activities. Senior management should use stress testing, complemented with scenario analysis, to evaluate an institution's risk decisions.

3. **D is correct.**

4. **B is correct.**

   The property of subadditivity states that a portfolio made up of subportfolios will have equal or less risk than the sum of the risks of each individual subportfolio.

5. D is correct.

Stress tests defined from an institutional perspective do not have to mirror those of external regulations. The expectation is that an institution would have its own stress tests that are used in addition to those defined by external regulations. Actions to be taken based on results, a plan for assessing the results, and revisiting modeling assumptions are appropriate updates to the stress-testing governance process.

Descriptive Questions

Answer

6. VaR is a method of assessing risk that uses standard statistical techniques routinely used in other technical fields. Formally, VaR is the maximum loss over a target horizon such that there is a low, prespecified probability that the actual loss will be larger. Based on firm scientific foundations, VaR provides users with a summary measure of market risk. For instance, a bank might say that the daily VaR of its trading portfolio is $35 million at the 99% confidence level. In other words, there is only one chance in a hundred, under normal market conditions, for a loss greater than $35 million to occur. This single number summarizes the bank's exposure to market risk as well as the probability of an adverse move. As importantly, it measures risk using the same units as the bank's bottom line. Shareholders and managers can then decide whether they feel comfortable with this level of risk. If the answer is no, the process that led to the computation of VaR can be used to decide where to trim risk.

7. To implement VaR for international equity portfolios, fund managers should use volatility and correlation datasets customized to their own needs, and have the capabilities to perform a drill-down analysis of the main sources of portfolio risk. In order to do that, it is necessary to count with historical price series for the stock market sectors of each country (may be individual equities) in their portfolios, and exchange rate series. Once the data is available, it is possible to create correlation and volatility datasets from that historical data following commonly accepted methodologies. Individual equities introduce too many factors, but treating the different market sector indices as the risk factors for each country, adds a reasonable number of risk factors for which we can collect volatility and correlation information on a regular basis, so that we can assign various asset codes which can be used for calculating VaR.

8. Limitations of Value at Risk

Though VaR has proved to be superior method of measuring risk, it has some limitations:

1. It cannot measure risk accurately in extreme market conditions, because it is difficult to model risk under such conditions. Suppose that the correlation between the US$ and the French Franc falls from 90% to 30%, VaR analysis will not immediately recognize this. It will perhaps take 50 or more days before sufficient daily price data is collected to reveal that the correlation has shifted downwards.
2. It focuses on a single arbitrary point. Also, it relies on simplified assumptions which may not be applicable to complex situations like options pricing.
3. It uses many models with a wide variety of assumptions and methods of calculation, producing different results under different models.
4. It is basically a statistical measure and not a managerial one.
5. There is no theory to show that VaR is the appropriate measure upon which to build optimal decision rules
6. It cannot capture model risk, thus requiring the use of model reserves also.
7. Volatility also keeps varying with time and is not stable.
8. Prices may not respond in a linear fashion to changes in the market variables, resulting in erroneous measurement by VaR.
9. The distribution may not be normal distributions in all the given circumstances.
10. Correlations may not be stable in all the given circumstances.
11. Riskmetrics^{TM} is not able to fully capture spread risks, option risk and yield curve changes, resulting in inaccuracy in the risk management.
12. It is based on the past data which may not always prove true in future.
13. Intra-day positions are not considered in VaR, which usually takes only the closing position into consideration.