



INSTITUTE OF ACTUARIAL
& QUANTITATIVE STUDIES

Subject: RM&IM

Chapter: Unit 1 & 2

Category: Assignment 1 solution

MCQS

Answer 1: D

Answer 2: E

Remember, we are being asked to determine the options that are true. Value-at-Risk, VaR, is a measure of downside risk. It may also be considered as the maximum loss at a given confidence level over a given period of time. VaR, does not capture catastrophic losses that have a small probability of occurring. It is also true that since most firms are more concerned about unexpected loss, the frequently used risk measure is Value-at-Risk. Daily VaR becomes meaningless if there is illiquidity. Thus, the correct answer is E.

Answer 3: E

Answer 4: D

Answer 5: A.

Answer 6: D

Answer 7: A

Scenario analysis is useful for allowing risk managers to assess secondary consequences of changes in risk factors.

Answer 8: B

Enterprise Risk Management (ERM) is a comprehensive and integrated framework for managing keys risks in order to achieve business objectives, minimize unexpected earnings volatility and maximize firm value. Thus, the correct answer is B.

Answer 9: E

We are told that the daily, 90% confidence level, value at risk of a portfolio is \$1,000,000. Hence, we would expect that: 9 out of 10 times (i.e. 90% of the time) the value of the portfolio will lose less than \$100,000.

Answer 10: C

Longer answers:**Answer 1:**

The **risk management process** is a formal series of actions designed to determine if the perceived reward justifies the expected risks.

Risk management process involves following five steps:

- a. Identify the risks, classify to **known or unknown**
- a. Determine the method to **measure risk**
- a. Perform a **cost benefit** analysis on the risk transfer
- a. Develop a **risk mitigation** strategy

- a. **Assess** performance and **amend** risk mitigation strategy

Answer 2:

Unexpected loss considers how much an entity could lose in excess of their average (expected) loss scenarios. For example, the default rate for a bank that lends too heavily to the technology sector will be driven not just by the health of individual borrowers, but by the business cycle of the technology sector as a whole. When the technology sector shines, making loans will look risk-free for an extended period; when the economic rain comes, it will soak any banker that has allowed lending to become too concentrated among similar or interrelated borrowers.

Therefore, correlation risk—the tendency for things to go wrong together—is a major factor when evaluating the unexpected loss and risk of this kind of portfolio.

Unexpected loss is also difficult to calculate because of the inherent volatility regarding its underlying factors, like the state of the economy in the above example.

Answer 3:

Firms can use different strategies to manage their risks. They broadly can be classified in the following manner:

- Accept the risk:** One reason to retain a risk is that it is perceived to have a small impact on the firm and managing the risk might prove more costly than it is worth.
- Avoid the risk:** If a business risk is not a natural part of normal business operation, then it should be considered as a possible risk to avoid.
- Mitigate the risk:** Mitigation can take many different forms depending on the risk factor involved. For e.g. A bank may mitigate credit risk by offering loans at higher interest rates, with shorter maturities, and/or with enhanced collateral requirements.
- Transfer the risk:** Transferring can be costly because it usually involves either purchasing insurance coverage or investing in derivatives. Transferring risk also introduces counterparty risk because the firm is relying on the third party to make good on the insurance provided if a risk event arises.

Answer 4:

Legal and Regulatory Risk arises for a whole variety of reasons; it is closely related to operational risk as well as to reputation risk.

Litigation has the potential to create uncertainty.

Legal risk could be – being sued.

Regulatory risk could be:

any changes in the regulation – disallowing certain business which was allowed earlier

Tax law changes

For example, when the British government changed the tax code to remove a particular tax benefit during the summer of 1997, one major investment bank suffered huge losses

Business Risk refers to the classic risks of the world of business, such as uncertainty about the demand for products, or the price that can be charged for those products, or the cost of producing and delivering products.

Business risk manifests in various forms like :

- o Uncertainty faced in course of running a business

- o Uncertainty regarding firms income
- o Actual demand being lower than anticipated
- o Price lower than expected
- o Cost over runs and unexpected costs
- o Production or shipping delays

Business risk is largely managed through core tasks of management, including strategic decisions—e.g., choices about channel, products, suppliers, how products are marketed, inventory policies, and so on

Answer 5:

Expected loss (EL) considers how much an entity expects to lose in the normal course of business.

The EL of a portfolio can generally be calculated as a function of:

- the probability of a risk occurring
- the dollar exposure (amount of loss) to the risk event
- the expected severity of the loss if the risk event does occur.

The expected credit loss for a credit card portfolio, for example, refers to how much the bank expects to lose, on average, as a result of fraud and defaults by cardholders over a period of time, say one year.

Because it is, by definition, predictable, expected loss is generally viewed as one of the costs of doing business, and ideally it is priced into the products and services offered to the customer.

For credit cards, the expected loss is recovered by charging the businesses a certain commission (2 to 4 percent) and by charging a spread to the customer on any borrowed money, over and above the bank's funding cost (i.e., the rate the bank pays to raise funds in the money markets and elsewhere).

For the credit card example, $EL = \text{Probability of default or fraud} \times \{\text{Amount of average dues}\}$

Answer 6:

Market risk is the risk that changes in financial market prices and rates will reduce the value of a security or a portfolio. It is the most important factor while managing the Investments

It can further be classified into the following types of risks:

Interest rate risk: The risk that the value of a security will fall as a result of an increase in market interest rates.

Equity price risk: Risk associated with volatility in stock prices.

General market risk/ Systematic risk: The risk that the market as a whole will fall in value.

Specific risk/ Unsystematic risk/ Idiosyncratic risk: It is unique to the particular equity or financial transaction under consideration.

Foreign exchange risk: Risk arising from open or imperfectly hedged positions in particular foreign currency denominated assets and liabilities leading to fluctuations in profits or values as measured in a local currency.

Commodity price risk: The number of market players having direct exposure to the particular commodity is quite limited, hence affecting trading liquidity which in turn can generate high levels of price volatility

Answer 7:

Advantages (In Practice)

One of the key reasons for a firm to hedge its risk exposures is the possibility of lowering its cost of capital (debt or equity), which could lead to increased economic growth. By reducing the volatility of its earnings/cash

flows, a firm may be able to increase its debt capacity in order to borrow funds to take advantage of lucrative investment opportunities.

Also, borrowing arrangements for firms with less volatile earnings/cash flows usually contain fewer conditions and restrictions imposed by the lenders.

Similarly, reduced volatility and greater stability of earnings/cash flows is often an indication to the firm's stakeholders that management is doing a good job. This is often reflected directly in the firm's stock price being stable or rising.

Hedging may allow management to control its financial performance to meet the requirements of the board of directors. For example, management is implicitly conveying the level of risk it is able and willing to accept on an unhedged basis (i.e., its risk appetite) when it makes choices on hedging specific risk exposures. The risk appetite would need to be approved in advance by the board so hedging may assist management in meeting the board's requirements.

Hedging may result in operational improvements within a firm.

Hedging through the use of derivatives instruments such as swaps and options may be cheaper than purchasing an insurance policy. One must consider whether the total cost of the insurance over the years exceeds the estimated losses.

Some arguments for hedging are focused on taxation. The existence of progressive tax rates may result in volatile earnings (with no hedging) incurring more income tax liability compared to stable earnings (with hedging). In addition, hedging with derivatives (off-balance sheet) may allow for more debt financing, which results in more tax deductions for interest costs incurred. In practice, neither argument seems to have much validity.

Answer 8:

Expected loss considers how much an entity expects to lose in the normal course of business. It can often be computed in advance (and provided for) with relative ease because of the certainty involved.

Unexpected loss considers how much an entity could lose outside of the normal course of business. Compared to expected loss, it is generally more difficult to predict, compute, and provide for in advance because of the uncertainty involved.

Answer 9:

There are three primary motivations for a firm to implement an ERM initiative:

(1) integration of risk organization, (2) integration of risk transfer, and (3) integration of business processes.

The respective benefits are better organizational effectiveness, better risk reporting, and improved business performance. However, implementation of an integrated firm-wide initiative is costly (both capital and labor intensive) and time-consuming. This process could last several years and requires ongoing senior management and board support.

Integration of Risk Organization: Increased Organizational Effectiveness While most companies have many individual risk management functions, including market, credit, and various other risk units, an effective ERM strategy aggregates these risks under a centralized risk management process. Under a centralized process, the role of a chief risk officer (CRO) is often created, which reports to the company's chief executive officer (CEO) and/or the board, while the various risk management units report to the CRO. The benefit of a centralized approach is a top-down, coordinated framework that factors in the relationships and interdependencies of various risks.

Integration of Risk Transfer: Better Risk Reporting Under the traditional, non-ERM approach, the various risks facing the company were evaluated by individual units within the organization, where each unit managed its own risk.

This approach is useful in mitigating isolated risks, but it does not account for diversification within or across the various risk types, which could lead to over-hedging of risks or taking out excessive insurance coverage. Further, since no one unit is responsible for overall risk reporting, reporting of risks can be inconsistent and contradictory.

By contrast, ERM enables the company to take a holistic view of all risks and risk hedges used in order to hedge only those undesirable residual risks that still remain after factoring in diversification across risks. Risks are categorized under a risk dashboard of key risks, which includes an enterprise level description of key exposures, total losses, policy exceptions, and even early warning indicators. Senior management and the board are, therefore, able to take a big picture view of the interplay between each of the risks and can take appropriate measures to mitigate any residual risk.

Integration of Business Processes: Improved Business Performance The third element of ERM is integrating risk management into the company's business processes. ERM can optimize business performance through business decisions, including capital allocation, product development and pricing, and efficient allocation of resources. This optimization results in reduced risk and only takes on the most profitable risks (i.e., maintains only those risks whose cost is less than the benefit of the corresponding project). Traditional risk measures such as value at risk (VaR) and risk-adjusted return on capital (RAROC) have been increasingly used to measure not only market risk but also credit and operational risk, while alternative risk measures such as credit derivatives are increasingly used to mitigate additional risks. The end result is a reduction in losses, lower earnings volatility, increased earnings, and higher shareholder value.

An effective ERM initiative allows company management to understand the major risk exposures and to set up adequate risk reporting. At the same time, auditors and regulators assess the company's ERM and set the necessary capital and compliance requirements for the board and senior management. In order to adequately address these requirements, the role of a "risk champion" has become more widespread, typically in the position of a CRO.

Answer 10:

The specific role of the CRO was created in the early 1990s in response to the emergence of new financial instruments and the integration of capital markets. The CRO is responsible for all risks facing a company, including market, credit, operational, and liquidity risks, is prominent among financial firms, firms with significant investment activities or foreign operations, and energy firms.

The CRO is a top-level executive responsible for overall risk management in a centralized role. Reporting to the CRO typically are the heads of the various risk functions, including the heads of credit, market, operational, and insurance risks. The CRO provides overall leadership, vision, and direction for ERM and develops a framework of management policies, including setting the overall risk appetite of the firm. This includes measuring and quantifying risks and setting risk limits, developing the requisite risk systems, and communicating a clear vision of the firm's risk profile to the board and to key stakeholders.

Within the firm's hierarchy, the CRO typically reports to the CEO or the chief financial officer (CFO); however, the role is placed somewhere between the CEO/CFO and the board. Often there is a dotted line relationship with dual reporting to both the CEO/CFO and to the board. The dotted line relationship is intended to minimize any potential friction

between the CRO and the firm's CEO or other top executives due potentially to excessive risk taking, regulatory issues, or outright fraud by the CEO or executives. In order to properly establish the reporting structure, it is important that the role of the CRO is clearly defined with clear goals and responsibilities for hiring and firing decisions.

Of course, the creation of the CRO role is not the only solution to establishing top-level risk oversight. The firm's audit committee could also take on this role, however, the audit functions are typically already stretched in their capacity to take on additional oversight roles. The centralization of all risk responsibilities could also be assigned to the CEO or CFO; however, there is strong support for establishing a separate oversight function in the role of the CRO who has experience and focused responsibility for risk management.

Over the last couple of decades, the CRO position, with its focused approach to risk management, has provided greater visibility and effectiveness to the role and to ERM. The role now represents the culmination of the risk executive functions with escalating salaries, and a company's CRO is often a contender for the highest executive roles including the role of the CEO. An ideal CRO possesses five critical skills: (1) leadership, (2) power of persuasion, (3) ability to protect the firm's assets, (4) technical skills to understand all risks, and (5) consulting skills to educate the board and business functions on risk management.



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