

MOCK TEST PAPER
FINAL (NEW) COURSE: GROUP – II
PAPER – 6A: RISK MANAGEMENT

Solutions

Note: Please note these solutions are for guidance purpose only.

Answers to Case Study One

- 1.1 The details that could be presented to and discussed at the Board Meeting would be as under, in respect of the key risks affecting the Company are illustrated below:

Economic Risk

Due to the opening of world trade and diminishing tariffs, XYZ Textiles is faced with the threat of pressure on margins on products.

To counter these, it stepped up its focus on value added products by upgrading and expanding manufacturing capacities and increasing R & D. In addition, structural cost optimization and cost control measures have been initiated.

Competitor Risk

The market is highly competitive with the elimination of fiscal barriers and inroads of large conglomerates into the country with inorganic growth strategies. The company continued to focus on increasing its market share and taking marketing initiatives that help customers in making informed decisions.

Project Execution Risk

The company is in the process of setting up cement capacities and captive thermal power plants. In the fibre business also, plans to increase the capacity are under implementation. The project execution is largely dependent upon land purchase, project management skills, timely delivery by the equipment suppliers and adherence to schedule by civil contractors. Any delay in project implementation will impact revenue and profit for that period. The Company has been continuously reviewing the project execution to ensure that the implementation schedules are adhered to.

Human Resource Risk

The Company's ability to deliver value also depends on its ability to attract, train, motivate, empower and retain the best professional talents. These abilities have to be developed across Company's rapidly expanding operations. There is significant competition from emerging service sectors, which poses inherent risks associated with the ability to hire and retain skilled and experienced professionals.

The Company continuously benchmarks HR policies and practice with the best in the industry and carries out necessary improvement to attract and retain best talent and build intellectual capital.

Foreign Exchange Risk

The Company's policy is to hedge its long-term foreign exchange risk as well as short-term exposures within the defined parameters. Long term foreign exchange liability is fully hedged, and hedges are on held to maturity basis. As imports (including capital goods import) exceeded exports, the Company has suitably hedged the differential short-term exposure from currency risk.

Interest Rate Risk

The Company is exposed to interest rate fluctuations on its borrowings. It uses a judicious mix of fixed and floating rate debts within the stipulated parameters. It continuously monitors its interest rate exposures and whenever required, uses hedging tools to minimize interest rate risk.

Commodity Price Risk

The Company is exposed to the risk of price fluctuation on raw materials, energy sources as well as finished goods. However, considering the normal correlation in the prices of raw materials and finished goods, the risk is reduced. The Company's strategy of backward integration, like pulp and caustic soda for VSF (viscose staple fibre) helps in minimizing the effect of increase in prices of raw materials. Setting up of captive power plants aids in controlling the impact of rise in energy cost, which is a major cost element. Forward integration in value added products for e.g. specialty fibre in VSF, ready mix concrete in cement enables to reduce the price fluctuation in the finished goods.

(6 Marks each for explaining one category of Risk – Maximum 30 Marks)

1.2 (c)

1.3 (c)

1.4 (c)

1.5 (c)

1.6 (a)

1.7 (b)

1.8 (b)

1.9 (a)

1.10 (b)

1.11 (a)

Answers to Case Study Two

2.1

Report

To

The Board of Director

AFL

Sub: Risk Management Report

As desired by Board of Director our report on the various issues is as follows:

(a) Different stakeholders involved and assessment of the impact of Risk upon them:

S. No.	Stakeholders	Nature of Impact
1	Owners, Boards & Management	Failure to achieve objectives, Delays, Change management, disruption, financial losses, etc.
2	Society	Loss of confidence, health hazards, direct or indirect financial losses, disruption in life style, etc.
3	Consumer	Health, financial losses, loss of confidence, etc.
4	Employee	Life, health, morale, engagement, attrition
5	Vendor/supplier	Loyalty, relationship, payment terms, attrition
6	Government, Regulators	Revenue loss, delays in project implementations, loss of public confidence, etc.
7	Investors	Loss of confidence, lower returns, litigation, financial losses, etc.

(b) Impact areas and their nature of impacts

Sr. No.	Impact Areas	Nature of Impact
1	Strategy and business objectives	Delays, change management, failure to achieve objectives
2	Financial	Direct or indirect financial loss
3	Customer	Loyalty, relationship, payment terms, attrition
4	Employee	Morale, engagement, attrition
5	Vendor/supplier	Loyalty, relationship, payment terms, attrition
6	Compliance	Delays, penalties, offences, defaults, imprisonment
7	Reputation/Brand equity	Loss of confidence, public exposures, litigation, etc.

(c) Available Risk Treatment Options

Sr. No.	Risk action	Description
1	Avoid	Exiting the activities giving rise to risk. Risk avoidance may involve exiting a product line, declining expansion to a new geographical market, or selling a division.
2	Reduce/Manage	Action is taken to reduce the risk likelihood or impact, or both. This, typically, involves any of the myriad of everyday business decisions. This involves addressing the root cause of the risk factor.
3	Transfer/Share	Reducing the risk likelihood or impact by transferring or, otherwise, sharing a portion of the risk. Common techniques include purchasing insurance cover, outsourcing activities, engaging in hedging transactions.
4	Accept	No action is taken to affect the risk likelihood or impact. This is mainly in cases where the risk implications are lower than the Company's risk appetite levels.

(d) Since the company's Risk Strategy and Policy is in place and is communicated and also the Risk appetite is defined the Risk Maturity level is 'Risk Managed'.

(e) Techniques that can be used to track the progress of Risk Management are as follows:

Technique	Description
Risk Questionnaires	Designed to identify the relevant risks and create risk history
Flow Charts with Risk Flags	Designed to identify operational risks embedded in the processes
Identified Controls to manage risks	Recognize controls and test their adequacy and operative effectiveness
Risk Event Maps	Identify potential events that can have a significant impact on business to avoid negative surprises
Risk Scorecards	A Monitoring tool to track progress of risk management
Capital Budgeting	A financial analysis tool to evaluate the future cash flow benefits arising from risk management actions against the costs of risk consequences

Value at Risk	A financial analysis tool to evaluate the impact of the worst case scenario of a risk event
Risk Heat Maps	A Monitoring tool to track progress of risk management using qualitative assessment of probability and impact of risk

(f) The various types of political risks which ultimately can affect the profit of the company are as follows:

- (i) *Nationalisation or Expropriation Risk*: This is most common form of risk wherein host country takes over the business of MNCs without or with inadequate compensation.
- (ii) *Exchange Control Risk*: This form of risk prevents the MNCs to get converted their earning from local currency to foreign currency to repatriate the same to home country of MNCs. Due to this restrictions even investors in MNCs business also suffer a lot.
- (iii) *Taxes, Rule and Regulation Risk*: This risk arises mainly due to a sudden or dramatic change in Rule and Regulations governing the host country. These sudden changes can be in any of following type of forms:
 - Unanticipated increase tax rates applicable for MNCs operating in the host country.
 - Compulsion to hire local workforce.
 - Compliances of stricter environmental standards.
- (iv) *Inefficient Legal System*: High level of red tapism and corruption at local and higher level pose a serious risk for MNCs operating in the host country as it leads to uncertainty and high cost of operation.
- (v) *Repudiation of Contracts*: This type of risk arises on account revocation of earlier awarded turnkey projects by the Government of host country without adequate consideration and damages. This risk is also called indirect expropriation risk.

(g) Benefits likely to be derived from a synchronized ledger that is distributed across the network's modes.

- Significant reduction in operational complexity
- Major increase in processing speeds and consequent asset availability
- Higher operating efficiency due to lowered reconciliation requirements
- Transparency and immutability in transaction record keeping
- Network security and safety due to distributed architecture
- Overall reduction in credit and operational risk

(h) Quantitative tools that can be used to assess the neighbouring Country Risk

S. No.	Index	Basis
1	Corruption Perception Index	It is one of the most popular indicator published by Transparency International. The ranking is numeral based ranging from 0-10. While 0 indicate least corrupt, 10 indicate highly corrupt.
2.	Democracy Index	Published by Economic Intelligent, countries are classified into following four groups. <ul style="list-style-type: none"> • Full democracy (8 to 10) • Flawed Democracy (6 to 10) • Hybrid Regime (4 to 5.9)

		<ul style="list-style-type: none"> • Authoritarian Regime (0 to 3.9) <p>This index is based on following 5 categories:</p> <ul style="list-style-type: none"> ❖ Electoral process pluralism ❖ Civil liberties ❖ Functioning of Government ❖ Political Participation ❖ Political Culture
3.	Freedom in the world	This survey is conducted by Freedom House and provides on the basis of study of Political rights and civil liberties. It uses rating based on 1-7 scale indicating 1 being most free and 7 being least free.
4.	Gini Coefficient	It is one of the most popular index to gauge the rich-n-poor income countries. It measures inequality in income distribution. It uses scales 0 to 1, where 0 indicates total equality and 1 indicates total inequality.
5.	Global Peace Index	This index is published by Vision of Humanity and derived from key information such level of crimes, violence, military expenditure etc.
6.	Human Development Index	<p>Published by UN rates, the countries on the basis of following factors:</p> <ul style="list-style-type: none"> ❖ Education level ❖ Literacy Rate ❖ Year of Schooling ❖ Income ❖ Life Expectancy and ❖ Standard of Living <p>It uses the scale of 0 to 1, where 0 being the least developed while 1 being the highest developed.</p>

Signed

Chief Risk Officer

Answers to Multiple Choice Questions

2.2 (c)

2.3 (d)

2.4 (a)

2.5 (a)

2.6 (d)

2.7 (c)

2.8 (c)

2.9 (c)

2.10 (b)

2.11 (c)

Answers to Case Study Three

- 3.1 (a) Bayes Theorem shows how a conditional probability of the form $P(B|A)$ may be combined with the initial probability $P(A)$ to obtain the final probability $P(A|B)$:

$$P[A|B] = \frac{P(B|A) * P(A)}{P(B)}$$

$$= \frac{P(B|A) * P(A)}{P(B|A) * P(A) + P(B|A') * P(A')}$$

Accordingly let us assume

Prob. of increasing price on Monday = A

Prob. of increasing price on Tuesday = B

$$P[\text{Increase on Monday if price increased on Tuesday}] = \frac{0.20 \times 0.30}{0.30 \times 0.20 + 0.70 \times 0.70}$$

$$= \frac{0.06}{0.55} = 0.1091 \text{ or } 10.91\%$$

- (b) The high cost of money laundering cases has prompted banks to seek new ways to address the severe limitations in current anti-money laundering risk management. Traditional approaches to anti money laundering remain dependent on rule-based, descriptive analytics to process structured data. This system clearly has limitations - without automated algorithms, detecting information within the wealth of data requires laborious keyword searches and manual sifting through reports.

Big Data analytics can improve the existing processes in AML operations. Its approaches allow for the advanced statistical analysis of structured data, and advanced visualization and statistical text mining of unstructured data. These approaches can provide a means to quickly draw out hidden links between transactions and accounts, and uncover suspicious transaction patterns.

Advanced analytics can generate real-time actionable insights, stopping potential money laundering in its tracks, whilst still allowing fund transfers for crucial economic and human aid to troubled regions. Big data technologies can identify incidents, help draw a wider picture, and allow a bank to raise the alarm before it's too late.

(c) $1 + R_G = \sqrt[n]{(1 + R_1) \times (1 + R_2) \times \dots \times (1 + R_n)}$

$$= \sqrt{(1 - 0.05)(1 + 0.15)} - 1 = 0.04522 \text{ i.e. } 4.52\%$$

- (d) (i) Despite the VaR measure being better known than the expected shortfall, the latter has more advantages:
- Expected shortfall is sensitive to the entire tail of the distribution, whereas VaR will not change even if there are large increases in some of the losses beyond the cut-off percentile at which the VaR is being measured.
 - Expected Shortfall is a more stable measure than VaR in showing less sensitivity to data errors and less day to day movement due to irrelevant changes in the input data.
 - With VaR, negative diversification effects can arise whereas expected shortfall never displays negative diversification effects.
- (ii) The main advantage of the use of Monte Carlo simulation is that we can generate correlated scenarios based on a statistical distribution. Due to which it models multiple risk factors.

Moreover, we can specifically focus on the tails of extreme loss scenarios. So, Monte Carlo Simulation method can be used both to calculate VaR as well as to complement it. Also, it can work both for linear and non linear risks. As unlimited number of scenarios is generated, this helps in creating correct distributions.

(iii) Calculation of NPV

Year	Expected Cash Flow (Rs.)	Certainty Equi. Cash Flow (Rs.)	Certain Cash Flow (Rs.)	PVF	PV of Cash Flow (Rs.)
1	12,00,000	0.87	10,44,000	0.943	9,84,492
2	14,00,000	0.84	11,76,000	0.890	10,46,640
3	18,00,000	0.93	16,74,000	0.840	14,06,160
4	27,00,000	0.82	22,14,000	0.792	17,53,488
					51,90,780
0	Cash Outflow				(50,00,000)
					1,90,780

Alternative Presentation

$$\begin{aligned}
 NPV &= \sum_{t=0}^n \frac{\alpha_t \times NCF_t}{(1+r_f)^t} - I \\
 &= \frac{12,00,000 \times 0.87}{(1.06)} + \frac{14,00,000 \times 0.84}{(1.06)^2} + \frac{18,00,000 \times 0.93}{(1.06)^3} + \frac{27,00,000 \times 0.82}{(1.06)^4} - 50,00,000 \\
 &= 51,90,760 - 50,00,000 \\
 &= 1,90,760
 \end{aligned}$$

- (e) (i) CDS contracts have obvious similarities with insurance, because the buyer pays a premium and, in return, receives a sum of money if an adverse event occurs.

However, there are also many differences, the most important being that an insurance contract provides an indemnity against the losses actually suffered by the policy holder on an asset in which it holds an insurable interest. By contrast a CDS provides an equal payout to all holders, calculated using an agreed, market-wide method. The holder does not need to own the underlying security and does not even have to suffer a loss from the default event. The CDS can therefore be used to speculate on debt objects. The other differences include:

- The seller might in principle not be a regulated entity (though in practice most are banks);
- The seller is not required to maintain reserves to cover the protection sold (this was a principal cause of AIG's financial distress in 2008; it had insufficient reserves to meet the "run" of expected payouts caused by the collapse of the housing bubble);
- Insurance requires the buyer to disclose all known risks, while CDSs do not (the CDS seller can in many cases still determine potential risk, as the debt instrument being "insured" is a market commodity available for inspection, but in the case of certain instruments like CDOs made up of "slices" of debt packages, it can be difficult to tell exactly what is being insured);

- Insurers manage risk primarily by setting loss reserves based on the Law of large numbers and actuarial analysis. Dealers in CDSs manage risk primarily by means of hedging with other CDS deals and in the underlying bond markets;
 - CDS contracts are generally subject to mark-to-market accounting, introducing income statement and balance sheet volatility while insurance contracts are not;
 - To cancel the insurance contract the buyer can typically stop paying premiums, while for CDS the contract needs to be unwound.
- (ii) Five C's of Credit that reviewed by banks in an attempt to mitigate the risk of lending to unworthy borrowers:
- (1) **Capacity** – This refers to the borrower's ability to repay the loan. The lenders / banks will consider the cash flows generated from the underlying business, timing of repayment and the probability of successful payment of the loan under various stressed scenarios.
 - (2) **Capital** – It is the promoters / borrower money invested in the business and is an indicator of how much of promoters / borrowers money is at risk if the business fails. FIs / banks will generally consider the borrowers debt to equity ratio to understand how much money the lender is being asked to lend as against the money invested by the promoters / borrower in the business. High debt to equity ratio indicates that the promoters / borrower already have high levels of debt / loans and could be having a higher financial risk.
 - (3) **Character** – It is the obligation that the borrower feels to repay the loan. Emphasis is given on the past loan repayment track record, credit history, credit bureau score. This analysis pertains to the softer aspect of the borrower's intent to pay rather emphasis on financials, ratios and cash flows.
 - (4) **Collateral** – It is a form of security for the lender in case there is default on the loan. In case of default, the lender will take possession of the collateral in place of debt. Collateral can be in the form of tangible assets like land, building, plant, machinery, cash flows, receivables, project assets etc. and also in the form of intangible assets like patents, trademarks etc. The loan agreement should be suitably drafted to include all the relevant details of the collateral. The lender would ideally want the term of the loan to match the useful life of the collateral.
 - (5) **Conditions** – Additionally, apart from the borrower specific criteria's, lenders may also consider external factors which may affect borrower's financials, cash flows and its underlying ability to repay the loan obligations. End use of the loan/ purpose for taking the loan / debt will also be carefully assessed and the transaction will be suitably structured.

3.2 (a)

3.3 (b)

3.4 (b)

3.5 (c)

3.6 (b)

3.7 (b)

3.8 (a)

3.9 (b)

3.10 (b)

3.11 (b)