Institute of Actuaries of India

Subject ST5 – Finance and Investment A

May 2008 Examination

INDICATIVE SOLUTION

Introduction

The indicative solution has been written by the Examiners with the aim of helping candidates. The solutions given are only indicative. It is realized that there could be other points as valid answers and examiner have given credit for any alternative approach or interpretation which they consider to be reasonable.

1.

- Ensure solvent trading and long-term future of the company.
- Demonstrate good corporate governance by acting in the best interests of the stakeholders.
- Good governance will be demonstrated by
  - Improving shareholder value and acting in the best interests of the shareholders at the time of mergers, takeover or share issue
  - Not seeking to make excessive profits from the customers
  - Paying appropriate compensation to suppliers

- Ensure that they comply with all legislation and should be open and honest in their dealings with all parties.
- Ensure that timely accounts are produced in line with regulation and give a true and fair view of the performance of the company
- Choosing appropriately skilled and experienced management to run the company
- Setting the dividend levels, balancing the need to return money to shareholders against the need to reinvest for the long-term interests of the business
- Non-executive directors are likely to have the responsibility for appointing new board members, setting remuneration package for executive directors and play a key role in the audit committee.

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(i) Term- Likely several years
Risk - very high chance of total loss of investment. Many corporate failures will occur (80%)
Return - returns earned by dividends / profit share or eventually selling interest to another investor
Return - over the medium to long-term expected returns are high (commensurate with the risk and the poor marketability)
Return - returns loosely correlated but diversified from listed equities
Marketability - likely very poor or not at all
Minimum investment - large or small depending on the individual circumstances
Other - likely to involve heavy hands on involvement/ may get board representation /influence over company's future.

(ii)

1. Stability of the government policy – Whether the policy is long term or ad-hoc in nature.
2. Taxation policy
3. Future potential for this sector
4. Competitive environment

5. Availability of technical and managerial expertise
6. Legal and political environment especially for acquisition of land etc.
7. Possible issues arising on the environment /greens front.
8. The regulatory environment for this sector
9. Since this is a start up, the experience and background of the promoters in terms of their work experience, track record and entrepreneurial skills

(iii)

- Objectives of the venture capital fund and its preferred trade off between risk and reward
- New Company's forecast cash flow and ability to service debt
- Uncertainty in the gross profit estimate
- The track record of the individuals and hence the likelihood of success of New Company
- Gross profit is accrued and not cash. That is New Company may not have the cash necessary to service the debt
- Terms and conditions of debt
- Debt interest is a contractual commitment
- Debt offers the prospect of no capital profit but possible loss
- Debt provides a committed exit strategy
- Debt offers the chance of asset security
- Exit strategy for the equity and whether this fits with the requirements of the venture capital fund
- Overall return on investment. Expected loss on debt, debt margin, ROE potential
- The debt refinancing strategy (if necessary) as the venture capital s debt becomes due for repayment

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3.
(i)
The failure of the managing director to recognise the differential timing between revenue and cost arising from the time it takes to manufacture and sell goods.
The failure to recognise that the short term profit resulting from selling from inventory whilst reducing fixed overheads could be much less than the loss of profit resulting from the inability to meet an upturn in demand and the considerable cost of rehiring/retraining staff and building new plant
The potential damage to the company s reputation in the employment market making it difficult to re-hire skilled labour.
One year s growth in demand is not likely to be representative of the medium term future
The recent demand may not have been measured accurately.
The time it will take to rebuild means that supply will be coming on stream in the future when demand may have changed and there may be a demand for new and different products.

Competitors may also be expanding to meet envisaged future demand
potentially reducing price and/or the number of sales in the future.
(ii)
Data over past 5 to 10 years showing
sales
market share
company s productive capacity
products manufactured and units sold
gross profit margin
net profit margin
inventory
numbers of employees
Strategic analysis of the industry and the products for the purpose of seeing how volatile demand is over time, the number of major competitors, the speed of product development and innovation and the potential long term demand for the company.
Calculate the ratio of inventory to sales on a quarterly basis. This should demonstrate the decline in inventory leading to apparent profits and the current difficulties in meeting demand.
Plot both the gross and net profit margins over time. Compare the long term past with the position just prior to the retrenchment/closures.
Estimate the cost of the redundancies and factory closures. Compare this with the current estimated costs of the expansion plans. Compare the preclosure production capacity with the current and proposed expanded capacity.

(iii)
Framing - having framed the lack of capital a cost of his success rather than bad planning, the MD is framing the rights issue as a success
Overconfidence - Hindsight bias-The MD is overestimating his own ability as he seems to be basing his decisions on what happened the previous year
Overconfidence-Confirmation bias- The MD is seeing events as confirmation that this is a successful strategy
Mental accounting- the MD has separated the events pre-his appointment outside the aggregate picture and has failed to incorporate these events as part of his planning.
Other reasonable applications of Behavioural Theory

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4.

- The cut in interest rate is likely to stimulate the economic activity.
- With the cut in interest rate Consumer expenditure is expected to increase because:
    - Cheaper credit would reduce the effective cost of goods and services
    - Lower interest rates may result in lower mortgage and other interest rates thus boosting the expenditure and asset creation
    - Low interest rates may result in lower levels of savings thus higher spending

- Capital project investment by businesses is likely to increase as the resulting lower cost of borrowing would reduce opportunity cost of investing
- Lower levels of interest on existing corporate debt will increase profits for those having floating rate interest.
- Low interest rates are likely to lead to devaluation of the domestic currency which will make exports attractive with a likely reduction in imports.

[5]

5. Growth Style, Value Style, Momentum Style, Contrarian Style, Rotational Style.

Growth style:
A growth manager chooses stocks that are expected to have high potential future earnings growth

These are typically identified as stocks having:

High actual sales and earnings growth
High forecast earnings growth
High return on equity
Upwards earnings revision

Value style:

A "value" manager chooses stocks that offer good fundamental value using certain traditional measures.

These measures are typically :

- A high book value to market price ratio.
- High dividend, earnings and cash flow yields.
- A high sales to market price ratio.

Momentum style:
Such managers do try to identify cheap stocks based on fundamentals about the company. Stocks are instead picked that appear to have risen in the recent past and look likely to continue to outperform. Stocks are sold that appear to be doing the reverse

Contrarian Style:

A contrarian manager does the opposite of a momentum manager, i.e., he chooses stocks that have fallen in price and seem "out of favour" on the basis that the market tends to overreact to news. He likewise sells stocks that have outperformed recently and so may now be expensive.

Rotational Style:

A rotational manager alternates between the growth style and the value style depending on how he reads the market. In times when the market is rising and bullish, he would look normally for growth stocks.

[5]

6.

(i) Risk budgeting refers to the process of establishing how much investment risk should be taken and where it is most efficient to take the risk in order to maximise return.

(ii) The risk budgeting process can be summarised as:

(1) Define the feasible set the set of asset classes that could be included in the portfolio. Here the risk budgeter will wish to obtain careful estimates of the volatilities and covariances of each asset class.

(2) Choose the initial asset allocation using some risk / return optimization process, and with a VaR assessment to determine the risk tolerance.

(3) Monitor risk exposures (increases and decreases in the values of the positions *and* changes in volatilities and correlations.

(4) Rebalance the portfolio in response to changes in the short-term conditional volatility and correlations of the assets. Allocations are altered to keep the overall portfolio risk at the level defined as tolerable for the investor.

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7.

(i)

- Counterparty to all trades
- Guarantor of all deals thus removing the credit risk
- Registrar of deals
- Holder of deposited margin
- Facilitator of the marking to market process
- Facilitates closing out the positions without the necessary to find the original partner.
- Keeps track of the positions of all traders and informs the traders about the margin monies due to and from the clearing house.

(ii)

- Margin system is the system in which each party to the futures contract deposits a collateral with the clearing house. It acts as a cushion against potential losses which the parties may suffer from future adverse price movements
- Initial margin is deposited when the contract is first struck
- This margin is changed on a daily basis through additional payments or withdrawals . This process is called variation margin.
- Through variation margin, the credit risk is controlled
- The process of daily margin requirement changes is known as “marking to market” . Through marking to market process, the traders position is everyday evaluated . If the market price moves adversely against the trader, the clearing house demands more margin to keep his/her position alive. Similarly, if the market movements are in favour of the trader, the excess margin money is returned to the trader. Through this process, the clearing house continues to give the guarantee for the trades.

(iii)

Futures Markets:

The fund manager B would need to find a suitable equity index that suits the equity portfolio being maintained . The exposure could then be reduced by selling the equity futures.

The equity exposure to international markets can be obtained by buying suitable futures in a variety of international markets. Both the actions of selling the domestic equity futures and buying in the international equity markets shall happen simultaneously.

The advantages and disadvantages are:

- It could be put in place very quickly due to the liquid nature of these markets.
- Inexpensive provided mainstream equity futures contracts are used
- Contracts need to be rolled over , thus incurring costs and risks
- Potential exposure to cross hedging risk as the futures and the underlying assets in the portfolio may not exactly match.

Options:

To buy call options on overseas equity indices such that the market exposure was sufficient. It would be possible to sell call options in the domestic equity market to hedge domestic exposure. The exposure of the options would be measured as delta x nominal exposure

The main advantage of this route relative to the others is that by buying and holding call options, it is possible to obtain upside exposure to the international markets without suffering the potential downside risks. The domestic market exposure could be hedged by buying put options rather than delta hedging described above and hence the downside risk could be hedged without compromising on the potential upside gains.

Options would be more expensive as they are less liquid than futures

When delta hedging , the amount of hedge has to continuously monitored and rebalanced in order to keep the hedge effective.

Option market strategies require payment of significant premium income which may have cash flow issues

Equity Swap:

This would be a contract under which fund manager B would agree to pass the proceeds of a notional domestic equity index portfolio to fund manager A in return for the proceeds of an index portfolio based on a basket of international equity indices over an agreed time period.

The advantages of this route would be that the size and nature of the deal would be negotiable between the two managers and could be arranged to suit both parties

The futures contracts on the desired indices will be available

The costs could be lower as brokerages etc., could be avoided

The term of the deal need not be restricted based on the durations of the available futures or options contracts

The deal can be reversed at any time subject to the consent of both the managers.

(iv)

The key items in the report are:

- Each derivative position should be listed in the report
- Each position should appear directly under the asset category whose exposure it affects
- The derivatives should be valued at market value
- Additional explanations should be incorporated where necessary to ensure that the nature of the transaction is understood.
- The report should show the net exposure to each asset category (allowing for the delta of each option where necessary
- A written explanation of the strategy undertaken should be included

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8.
(i) (a) Counterparty risk. The default occurred before payment exposing the fund manager to the replacement cost of finding the bonds from another bank.
(b) Liquidity risk since the fund manager cannot liquidate the assets. This may be due to either the size or nature of the stocks being sold.
(c) Settlement or credit risk due to the failure of the farm to deliver goods to the supermarket despite the fact that the goods have been paid for.

(ii) The credit-related occurrence that triggers the payment on a credit default swap might include:
_ bankruptcy (insolvency, winding-up, appointment of a receiver)
_ a rating downgrade
_ repudiation
_ failure to pay
_ cross-default

(iii)
_ Currency risk. The risk is that the delivered bonds are not of the same currency as the short bond position. This creates the risk that:
_ the short position is not hedged on default;
_ the incremental return on the bond premium; and _the mark-to-market value of the position does not correlate leaving the short bond position uncovered.

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Floating premium and/or floating funding spread. If both the short and delivered bonds are the same currency, the return on the default swap may return from the bond if the premium received on the swap does not have a fixed relationship with the funding spread being received on the bond.

_ Interest rate risk. The risk is that until an event of default, the mark-to market value of the hedge may not correspond leading to an inexact hedge as interest rates change since the maturity of the credit default swap may not equal the short bond position. After default, the maturity tends to be irrelevant in pricing terms.

_ Credit event risk. The risk is that the default trigger on the short bond is different from the swap due to differences in definition of default in the bond and swap documentation leading to an inexact hedge.

_ The risk is that on default the value of the short position is different from the value of the delivered bond as they are issued by different entities and different recovery rates are expected.

_ Differing creditor ranking. The risk is that on default the value of the short position is different from the value of the delivered bond as they have different ranking of creditors in insolvency.

_ Settlement risk. The risk is that either during the bond trade or at default, the bonds are not delivered for settlement.

_ Market value risk. The risk is that £100m nominal short position of bonds were not priced at par when traded, hence 100m nominal bonds delivered under the credit default swap may not equal the short position on default.

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9.

(i)

- Reduced funding costs in order to reduce the cost of borrowings if the company wishes to raise debt in the market for either expansion/acquisition etc.
- Peer group pressure to demonstrate to the market the relative financial strength of the company vis-à-vis the competition.
- Demonstration to creditors. Well rated companies might attract particular type of business.
- Take account of the economic cycle to hold excess capital in times when it is easily available as a store for the times in the cycle when capital is expensive or unavailable. This may give competitive edge in the market.

(ii)

- Industry analysis - Assessing the fundamental risks of the industry in which the company is operating. Since this company is operating in the steel industry, which is a commodity based industry prone to economic cycles, the rating agency would likely assess at what stage of the economic cycle the industry is currently and how vulnerable the company is to recession etc.
- Competitive position in terms of technology, reach, marketing strength, brand value etc.
- Down side risks vs upside potential
- Level and quality of profitability, EPS growth in terms of stability, expected growth etc.
- Cash flow position of the company
- Level of management competency , strategic focus of the company, track record of the management, risk appetite , business plans, process orientation
- Organisational structure, succession planning
- Capital Structure and financial flexibility
- Current tax structures and economic policy relating to commodities and especially the steel industry
- Availability of the raw materials, whether the company owns any mines of iron ore etc.,
- Connectivity of the factories to ports and other industrial centres and the likely cost of transportation
- Whether the overseas subsidiaries are contributing to the profits or a drain on the parent company

(iii)

The company's financial strength, Operating Performance and Market profile are analysed before assigning the rating

Financial Strength Analysis:

- Operating and financial leverage
- Cost Structures in terms of manufacturing cost, marketing costs, administrative costs
- Capital Structure of the company in terms of Debt: Equity Ratios
- Ratio Analysis in terms of liquidity ratio, current ratio, asset turnover ratio, inventory ratio etc.,
- Cash flow position
- Asset leverage
- What is the return generated by the overseas subsidiaries on the capital employed vis-à-vis the parent company
- Is there any strategic savings in costs due to operations in various countries in terms of savings in raw material costs, transportation costs etc.

Operational Performance:

- Sources and trends of profitability
- Revenue composition in terms of sales of goods, revenue from overseas subsidiaries , income from investments etc.

Market Profile:

- Market risk
- Competitive market position
- Spread of risk across different markets and countries
- Are there any threats of takeover
- Is the company in a position to acquire any companies to expand operations etc.

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