

# Question Paper

## Portfolio Management and Mutual Funds – II (252) : April 2006

### Section D : Case Study (50 Marks)

- • This section consists of questions with serial number 1 - 5.
- • Answer all questions.
- • Marks are indicated against each question.
- • Do not spend more than 80 - 90 minutes on Section D.

### Case Study

**Read the case carefully and answer the following questions:**

1. Mr. Paul has opted for investment in Nifty BeEs Exchange Traded Funds to take advantages associated with it. Explain the advantages associated with Exchange Traded Funds (ETFs)?

(6 marks) < Answer >

2. a. Calculate tracking error of Nifty BeEs Exchange Traded Fund.
- b. Calculate information ratio of Nifty BeEs Exchange Traded Fund.
- c. Find out the probability that the fund shows negative performance.

(5 + 2 + 3 = 10 marks) < Answer >

3. Calculate the amount of funds to be allocated to each of the bonds so that future net cash flows of Mr. Paul can be met with the coupon and redemption value of the bonds. Also show the total amount to be invested in six bonds.

(14 marks) < Answer >

4. a. Construct a characteristic regression line for each of the stocks in which Mr. Paul has made investment.
- b. Calculate the standard deviation of the residuals from each regression equation of all stocks.

(6 + 6 = 12 marks) < Answer >

5. Define the concept of Nifty STraP, a portfolio management service introduced by Benchmark mutual fund. And also explain how it works.

(8 marks) < Answer >

Mr. Paul is a Chartered Financial Analyst, and runs his own consultancy firm for providing investment advisory services. He does not have any immediate personal liquidity requirements, as he has inherited property. However, he is planning to expand his consultancy services by opening new branches across the country. For that purpose, for the next 6 years, he estimates cash inflows from his business operations and as well cash outflows for his business expansion plans as follows.

| Year | Outflows (Rs.) | Inflows (Rs.) |
|------|----------------|---------------|
| 1    | 10,00,000      | -             |
| 2    | 15,00,000      | -             |
| 3    | 40,00,000      | 2,00,000      |
| 4    | 25,00,000      | 4,00,000      |
| 5    | 18,00,000      | 6,00,000      |
| 6    | 10,00,000      | 8,00,000      |

To meet his net cash flow requirements from time to time, he identified the following bonds for investment.

|  | Coupon (%) | Maturity (years) | YTM (%) |
|--|------------|------------------|---------|
|--|------------|------------------|---------|

|        |     |   |      |
|--------|-----|---|------|
| Bond A | 7.0 | 1 | 5.96 |
| Bond B | 7.5 | 2 | 6.10 |
| Bond C | 8.0 | 3 | 6.28 |
| Bond D | 8.5 | 4 | 6.35 |
| Bond E | 9.0 | 5 | 6.50 |
| Bond F | 9.5 | 6 | 6.72 |

Face value of each bond is Rs.100

Furthermore, as a Financial Analyst, he wants to be innovative in his investment plans. He is planning to invest in Nifty BeEs Exchange Traded Fund introduced by Benchmark Mutual Fund to benefit from certain advantages associated with it.

The objective of Benchmark Mutual Fund is to provide low cost innovative products that enhance returns at acceptable levels of risk. To attain this objective, it plans to employ "Quantitative Techniques" to investing. Quantitative Techniques captures the massive amounts of financial information, analyzing and transforming it to develop disciplined and rigorous models to investing. With the rapidly increasing availability of online information, computational power growing exponentially, Quantitative Techniques to investing is already a significant phenomenon globally and is growing rapidly.

Initially, it planned to introduce to investors, the benefits of index strategies. Over a period of time it planned to introduce other value-added products, which apply quantitative techniques covering all asset classes. The major products of Benchmark Mutual Fund are Nifty BeES, Junior BeES, Liquid BeEs, Bank BeES, Derivative Fund, Split Capital Fund. Furthermore, it is also providing portfolio management services of Nifty Strap and Capps (Capital preservation portfolio system). Nifty STraP is one quantitative model developed by Benchmark Asset Management Company Private Limited. Nifty StraP is the first such exercise in India. It has been in use since February 2003. In a nutshell, Nifty STraP implements the age-old principle of sell at highs and buy at lows, disciplined by a quantitative model.

### **Nifty BeES ETF**

#### **Objectives**

Nifty BeES is the first ETF (Exchange Traded Fund) in India

The Investment objective of Nifty BeES is to provide investment returns that, before expenses, closely correspond to the total returns of securities as represented by the S&P CNX Nifty Index.

#### **Golden Peacock Award**

Nifty BeES won the Golden Peacock Award in the Most Innovative Financial Product in 2002-03 Category given by the Institute Of Directors (IOD), Delhi.

#### **About Nifty BeES**

One Unit of Nifty BeES is approximately 1/100th of the S&P CNX Nifty Index.

Nifty BeES is listed and traded on the NSE -Capital Market Segment and is settled in the Rolling Segment on T+2 basis.

Nifty BeES can be settled only in electronic (demat) form.

|                     |                                          |
|---------------------|------------------------------------------|
| Scheme Name         | Nifty BeES                               |
| Type of Fund        | Open Ended Exchange Traded Index Fund    |
| Managers            | Benchmark Asset Management Co. Pvt. Ltd. |
| Related Index       | CNX Nifty Index                          |
| Exchange Listed     | National Stock Exchange                  |
| NSE Ticker          | NIFTYBEES                                |
| Fund Inception Date | December 28,2001                         |
| Expense Ratio       | 0.80%                                    |
| Entry / Exit Load   | Nil                                      |
| Listing Date        | January 08,2002                          |
| ISIN                | INF732E01011                             |

|                                  |         |
|----------------------------------|---------|
| Reuters Code                     | NBES.NS |
| Reuters Intra-day Indicative NAV | BEES01  |
| Bloomberg Code                   | NBEES   |

### Buying / Selling Nifty BeES

For Ordinary Investor - Through Secondary Market On NSE

|             |                        |
|-------------|------------------------|
| Lot Size    | 1 Unit                 |
| Price       | Price available on NSE |
| Eligibility | Any Investor           |

For Authorized Participant - Directly with Fund

|             |                                                                                |
|-------------|--------------------------------------------------------------------------------|
| Lot Size    | 10000 Units                                                                    |
| Price       | In exchange for basket of Junior securities and Cash defined as "CreationUnit" |
| Eligibility | Authorised Participant /Large Industry                                         |

| Asset Breakdown          | %      |
|--------------------------|--------|
| Equity                   | 100.03 |
| Others / Unlisted        | N.A    |
| Debt                     | N.A    |
| Mutual Funds             | N.A    |
| Money Market             | N.A    |
| Cash / Call              | N.A    |
| Net Receivable / Payable | N.A    |

| Absolute Returns | %    |
|------------------|------|
| Period           |      |
| 3 months         | 13.8 |
| 6 months         | 29.8 |
| 1 year           | 37.9 |

| Top Holdings in Stocks          | %     |
|---------------------------------|-------|
| Oil and Natural Gas Corporation | 12.33 |
| Reliance Industries             | 9.01  |
| Tata Consultancy Services       | 5.80  |

| Top Sectoral Weightages      | %     |
|------------------------------|-------|
| Oil & Gas                    | 23.20 |
| Information Technology       | 18.29 |
| Banking & Financial Services | 13.22 |

Mr.Paul has already invested in the stocks of TCS, Reliance and ONGC, which are forming major part of Nifty BeEs portfolio.

### Appendix -I

|            | NSE BEeS NAV<br>(Rs.) | S&P CNX Nifty |
|------------|-----------------------|---------------|
| 31 Dec 05  | 284.8702              | 2822.90       |
| 30 Nov 05  | 267.7190              | 2652.25       |
| 31 Oct 05  | 239.5003              | 2370.95       |
| 30 Sep 05  | 262.7721              | 2601.40       |
| 31 Aug 05  | 240.2644              | 2384.65       |
| 29 July 05 | 232.5926              | 2312.30       |

|            |          |         |
|------------|----------|---------|
| 30 June 05 | 223.1814 | 2220.60 |
| 31 May 05  | 208.9537 | 2087.55 |
| 29 Apr 05  | 190.3085 | 1902.50 |
| 31 Mar 05  | 203.6859 | 2035.65 |
| 28 Feb 05  | 210.5361 | 2103.25 |
| 31 Jan 05  | 209.5801 | 2057.60 |
| 31 Dec 04  | 211.8807 | 2080.50 |

#### Appendix-II

| Date       | TCS (Rs.) | Reliance (Rs.) | ONGC (Rs.) |
|------------|-----------|----------------|------------|
| 31 Dec 05  | 1684.7    | 855.95         | 1189.35    |
| 30 Nov 05  | 1521.1    | 832.7          | 1029.65    |
| 31 Oct 05  | 1401.25   | 762.5          | 929.05     |
| 30 Sep 05  | 1482.35   | 793.55         | 1061       |
| 31 Aug 05  | 1384.35   | 719.4          | 981.85     |
| 29 July 05 | 1268.8    | 703.35         | 938.5      |
| 30 June 05 | 1358.1    | 642.55         | 1027.45    |
| 31 May 05  | 1334.25   | 535            | 922.75     |
| 29 Apr 05  | 1131.1    | 528.05         | 811.2      |
| 31 Mar 05  | 1390.55   | 546.05         | 885.3      |
| 28 Feb 05  | 1380.9    | 556.25         | 852.7      |
| 31 Jan 05  | 1300.4    | 532.3          | 818.6      |
| 31 Dec 04  | 1335.45   | 533.7          | 819.95     |

#### END OF SECTION D

### Section E : Caselets (50 Marks)

- This section consists of questions with serial number 6 - 11.
- Answer **all** questions.
- Marks are indicated against each question.
- Do not spend more than 80 - 90 minutes on Section E.

#### Caselet 1

Read the caselet carefully and answer the following questions:

6. According to the caselet, it is not only important but also essential for a mutual fund investor to be aware of and understand various risks involved in mutual fund investment. Explain various types of risks, apart from typical market risk, associated with mutual fund investment.

(9 marks) < [Answer](#) >

7. According to the caselet, investors usually do common mistakes while making investments in mutual funds. Explain.

(6 marks) < [Answer](#) >

Disclaimer of the Mutual Funds - "Mutual Fund Investments are Subject to Market Risks. Please read the offer document carefully before investing. There is no assurance or guarantee that all the objectives of the fund will be achieved. Past performance of the sponsors/mutual fund/schemes/Asset Management Company is not necessarily indicative of future results. The name of the fund/scheme does not, in any manner, indicate either the quality of the fund, its future prospects or returns."

The above statements are inevitably found in every disclaimer clause of the mutual funds.

It may be interpreted that unless there is a greater amount of risk involved in the subject matter, disclaimer statement(s) may not be lengthier. In fact, these disclaimers, directly or indirectly, give a clear message that investors should be informed, take adequate care and beware of the inherent risks before investing in the mutual funds. Now, the issue is whether the mutual fund investors in India are aware of the various risks involved in the mutual fund investments, and what steps are required to mitigate such risks. Mutual funds will also have the common risks that any investment has. In fact, risk is present in every decision made with regard to the investments in capital markets. The risk has to be properly assessed to determine whether it is worth bearing or not.

The mutual fund works within the regulatory framework of Sebi as per the provisions of the Sebi Mutual Fund Regulations 1996 and other rules and regulations declared by Sebi from time to time. Sebi keeps a close watch on the mutual funds through various methods. The main objective of these rules and the regulations is to protect the mutual fund investor and to keep him informed about the developments from time to time. In spite of such strict supervision and regulations, there are various risks that are faced by the mutual fund investors. Thus, although mutual funds aim and attempt to reduce the risk of large price fluctuations through careful selection of securities and by maintaining a diversified portfolio, investors need to be conscious that there are certain risks involved even with them. It is not only important but also essential for a mutual fund investor to be aware of and understand these risks.

It is understood from market sources that some investors have already complained to Sebi on the mutual funds highlighting how the mutual funds are promoting unwarranted NFOs for higher commissions, while they have either parked considerable amount of funds in short-term debt products or held cash. Because of this, the returns to the investors would be poor and the investment objectives of the respective schemes cannot be achieved. However, the upward revision of GDP growth rate for the last fiscal from 8.2% to 8.5%, decision to allow private sector provident funds to invest in equity markets and equity mutual funds are expected to provide a healthy base for the mutual funds to grow further and yield satisfactory returns to the investors.

At present, as per the Sebi regulations, the total costs that can be passed on to the investors are capped at 2.25% and all costs above the ceiling of 2.25% have to be absorbed by the fund houses. However, the mutual funds are permitted to pass the incidence of the tax to their investors within the 2.25% ceiling. Accordingly, the tax is not passed on to the investors by the mutual funds and it is borne and paid by the distributors of the mutual funds. In a new development, the Finance Minister has clarified in his 2005-06 Union Budget that the service tax imposed on the distribution of mutual fund units will have to be paid by the fund houses instead of the distributors. The ceiling of 2.25% on the mutual fund expenses was fixed before the government introduced the service tax. Mutual funds have been under tremendous pressure over high costs of operations due to the increase in their costs. Representing its members, the Association of Mutual Funds in India (AMFI) has sought permission from Sebi to bill the tax levy to the investors in the wake of the new budget provision that takes effect from April 1, 2005. It is expected that Sebi may either allow the mutual funds to pass on the tax to its investors or may increase the overall ceiling of the costs. It means mutual fund investors may have to bear additional costs in the days to come.

Thus, although mutual funds aim and attempt to reduce the risk of large price fluctuations through careful selection of securities and by maintaining a diversified portfolio, investors need to be conscious that there are certain risks involved even with them. It is not only important but also essential for a mutual fund investor to be aware of and understand these risks. Furthermore, it is common that investors make mistakes while choosing the funds for the purpose of investing.

## Caselet 2

**Read the caselet carefully and answer the following questions:**

8. The growth of private equity did not reach any heights in the emerging markets as it did in the US. According to you, what are the possible factors contributing to such situation?

**(9 marks) < Answer >**

9. According to the caselet, a private equity fund, like a hedge fund, is an unregistered investment vehicle in which investors pool money to invest in securities. How do you compare the private equity fund with the hedge fund? Explain.

(8 marks) < Answer >

A private equity fund, like a hedge fund, is an unregistered investment vehicle in which investors pool money to invest in securities. It was during the early 1990s that emerging markets appeared to be a fertile ground for private equity investors. The enormous scope for doing business, the latent demand for the products and the attractive interest rates seemed to favor them. The increase in the returns from the US equity markets triggered institutional investors to look for new opportunities. Another concern was the fact that the heightened capital inflow to the US private equity could outpace the supply of high return investments. All this eventually led to a unified destination, i.e., the emerging markets.

The foreign trade policies of several emerging economies became more receptive towards the private sectors and especially towards foreign investors. During the period between 1992 and 1998, the Foreign Direct Investments (FDI) increased at a compounded annual growth rate of 19% in Asia, 27% in Eastern Europe and 19% in Latin America. But these figures were not very convincing as only a few select firms were tapping the opportunities of private equities and most companies were shying away from the same. The problem was compounded with the government's dependence on private savings to finance public sector deficits to bailout ailing companies. This resulted in the crowding out of private sector access to capital. To cite an example, it was observed that in Brazil, one of the emerging economies, almost 40% of the private bank assets were invested in government securities until a couple of years ago. The growing demand for private equities in the emerging markets was further felt by the fact that the pattern of financing was heavily biased in favor of a relatively small number of large firms.

With various factors contributing to the growth of private equities in the emerging markets, the mid-1990s witnessed a proliferation of the same in a massive scale. By the end of the decade, Latin America housed almost hundred funds that were virtually non-existent prior to that period. In a span of five years (1992-1997), the average annual growth rate of private equity was around 115% (\$5 bn). In the various emerging markets, the figures grew at a faster rate. The same period also witnessed that around 500 funds were pumping approximately \$50 bn.

Keeping all the factors in mind, it has become important for private equity investors to be very cautious in selecting the business deals. Fund providers are becoming more proactive in the deal selections. Further, it is to be noted that the post-investment roles of the private equity investors in the emerging markets are more important than the initial period of financing; thus exit strategies must be well in place and need to be carefully evaluated before finalizing the deals. In the earlier days, most of the private firms relied too heavily on the investment bankers when capital was required, but attending the periodic meetings, reading the financial statements and monitoring the financial performance from far became difficult. Thus, professionals were required to take the lead and the obvious choice was private equities. As long as one agrees to the basic fact that the growth of any nation is fundamentally driven by the private sector, the requirement of private equities will remain as a primary source of financing in the years to come. However, the growth of private equities did not reach any heights in the emerging markets as it did in the US. Increasing awareness towards globalization, cross-border flow of capital, fewer barriers towards trade and investments and increased competition would further champion the cause of private equities in emerging economies.

### Caselet 3

**Read the caselet carefully and answer the following questions:**

10. According to the caselet, portfolio rebalancing is one of the purposes for which mutual funds can use derivatives. Define portfolio rebalancing and explain different ways through which it can be done?

(10 marks) < Answer >

11. Arbitrage is basically taking opposite positions in two different markets on the same underlying with the same quantity and thus locking in the price difference. Any movement in the prices from there doesn't affect the net returns as the losses in one position are offset by the gains in another position. Explain how does this arbitrage work in futures market.

(8 marks) < Answer >

Mutual fund as an industry has really come a long way since its inception in India in 1963. The assets under management have increased from a modest Rs. 67,000 mn in 1988 to

Rs.470,040 mn in 1993. When private players were allowed in this segment, a great deal of fund deployment, innovations and increased participation happened in this segment. On July 31, 2005 the total assets under management touched Rs.2,402,760 mn with a total of 1,667 schemes managed by 31 asset management companies.

All these facts indicate one thing, i.e., India is quickly becoming an economy where money would be more and more institutionalized. Currently, the major avenues of investment for these institutions are debt and equities markets. The debt markets are less volatile, when compared with equities. So, a lot of focus and energies are being invested in managing these volatilities and benefiting from them. One of the effective methods of managing risk and exploiting the benefits in the equity markets is by using equity derivative instruments. The equity derivative instruments generally used are index futures, stock futures, index options and stock options.

Mutual funds can use derivatives for the purposes of hedging, portfolio rebalancing, arbitraging, within the restraints of the regulations.

Hedging means to take offsetting position so as to manage the losses that may be incurred on the existing position/portfolio. It is basically creating a defense against financial loss. Hedging against the existing portfolio using derivatives can be done mainly in two ways by mutual funds—selling index futures or buying puts. The idea behind this is to keep the NAV of the mutual funds intact or least affected in the wake of some unfavorable events.

Arbitrage is basically taking opposite positions in two different markets on the same underlying with the same quantity and thus locking in the price difference. This is a market neutral strategy. The gains locked in are risk free. Any movement in the prices from there doesn't affect the net returns as the losses in position are offset by the gains in another position.

The regulatory environment for mutual funds saw a paradigm shift on September 14, 2005. The erstwhile highly regulated environment gave way to a much more liberal system for the use of derivatives. The main idea behind this change is to bring mutual funds at parity with Foreign Institutional Investors (FIIs) as far as the limits for using derivatives are concerned, thus, creating a level playing field. For example, on September 14, 2005, the index futures' open interest was around Rs.6,400 cr, so as per the changed guidelines each mutual fund can take position worth Rs.250 cr or Rs.960 cr (15% of Rs.6,400 cr), whichever is higher. This gives an idea regarding the extent of volume increase that the markets shall be experiencing. This would lead to lower impact cost and better price discoveries. Also, mutual funds shall come up with specific schemes on derivatives only.

One can say that as far as equity derivatives are concerned mutual funds have really a long way to go. As for the derivatives market, which has just stepped into India, there are many more things to come. The thing to set eyes on is how these two giants get together to benefit and pass it on to the investors.

**END OF SECTION E**

**END OF QUESTION PAPER**

## Suggested Answers

### Portfolio Management and Mutual Funds – II (252) : April 2006

#### Section D : Case Study

1. ETFs are open-ended exchange traded funds that are designed to track specific indices and trade just like any other stock combined with benefit of a mutual fund. While ETFs are similar to index funds, they differ in many ways. ETFs can be bought and sold over the exchange through a broker on a daily basis at real-time prices unlike traditional equity funds. As they are traded on the exchange they can be bought / sold through any broker across the country thereby reaching out to a larger number of investors at the lowest possible cost. ETFs are different from conventional index funds in the sense that ETFs are traded throughout the day unlike index funds whose NAVs are computed. As ETFs are no load schemes and annual management fees are generally lower, it is an easy and cost efficient way to invest in a basket of securities. It provides liquidity for those investors with a shorter-term horizon as they can trade intra-day at prices near to the NAV. Being real-time, it gives investors better control and flexibility to manage their investment. As the initial investment is low, investors find it simple and convenient to buy/sell. You can buy an ETF just the way you buy a share -- from a stock exchange. You can also buy it from a mutual fund that manages such a scheme. If you want to invest in a basket of scrips which make up an index but you do not know the nitty-gritty of futures trading. Then you need to invest in exchange traded funds (ETFs). ETFs mirror an index since they invest in the constituents of the index in the same proportion as the index and come with the feel of the index. They are largely passive in their investment strategy and their returns are more or less in line with the returns in the index.

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2. a. Tracking error is the standard deviation of the difference between a fund's return and the benchmark index.

It can be calculated as follows for Nifty BeEs ETFE of Benchmark Mutual Fund:

|           | Returns (%) on ETF<br>Portfolio (X) | Returns (%) on NSE<br>Nifty (Y) | (X-Y) | (X-Y) - ( $\overline{X-Y}$ ) | $[(X-Y) - \overline{X-Y}]^2$ |
|-----------|-------------------------------------|---------------------------------|-------|------------------------------|------------------------------|
| Jan 2005  | -1.09                               | -1.10                           | 0.01  | 0.09                         | 0.0078                       |
| Feb 2005  | 0.46                                | 2.22                            | -1.76 | -1.69                        | 2.8532                       |
| Mar 2005  | -3.25                               | -3.21                           | -0.04 | 0.03                         | 0.0011                       |
| Apr 2005  | -6.57                               | -6.54                           | -0.03 | 0.05                         | 0.0022                       |
| May 2005  | 9.80                                | 9.73                            | 0.07  | 0.14                         | 0.0207                       |
| June 2005 | 6.81                                | 6.37                            | 0.44  | 0.51                         | 0.2589                       |
| July 2005 | 4.22                                | 4.13                            | 0.09  | 0.16                         | 0.0258                       |
| Aug 2005  | 3.30                                | 3.13                            | 0.17  | 0.24                         | 0.0589                       |
| Sep 2005  | 9.37                                | 9.09                            | 0.28  | 0.35                         | 0.1238                       |
| Oct 2005  | -8.86                               | -8.86                           | 0.00  | 0.08                         | 0.0057                       |
| Nov 2005  | 11.78                               | 11.86                           | -0.08 | -0.01                        | 0.0001                       |
| Dec 2005  | 6.41                                | 6.43                            | -0.03 | 0.05                         | 0.0021                       |
| Total     |                                     |                                 | -0.88 |                              | 3.3603                       |
| Average   |                                     |                                 | -0.07 |                              |                              |

From the table, it is clear that the variance of the difference between the return on

$$\text{Nifty BEes and the standard market index } \sigma^2 = \frac{3.3603}{11} = 0.3055(\%)^2$$

$$\therefore \text{Tracking error} = \sqrt{0.3055} = 0.5527\%$$

$$\text{Annualized Tracking error} = 0.5527 \times \sqrt{12} = 1.9146\%$$

b. Information Ratio = (Return on fund – Market return)/Tracking error = (2.7-2.77)/0.5527 = -0.12665

c.

|                    | Returns<br>(%) on<br>ETF<br>(X) | (X- $\bar{X}$ ) | (X- $\bar{X}$ ) <sup>2</sup> |
|--------------------|---------------------------------|-----------------|------------------------------|
| Jan 2005           | -1.09                           | -3.78           | 14.31                        |
| Feb 2005           | 0.46                            | -2.24           | 5.02                         |
| Mar 2005           | -3.25                           | -5.95           | 35.42                        |
| Apr 2005           | -6.57                           | -9.27           | 85.84                        |
| May 2005           | 9.80                            | 7.10            | 50.41                        |
| June 2005          | 6.81                            | 4.11            | 16.90                        |
| July 2005          | 4.22                            | 1.52            | 2.31                         |
| Aug 2005           | 3.30                            | 0.60            | 0.36                         |
| Sep 2005           | 9.37                            | 6.67            | 44.49                        |
| Oct 2005           | -8.86                           | -11.55          | 133.49                       |
| Nov 2005           | 11.78                           | 9.08            | 82.53                        |
| Dec 2005           | 6.41                            | 3.71            | 13.76                        |
| Total              | 32.37                           |                 | 484.85                       |
| Variance           | 2.70                            |                 | 44.08                        |
| Standard Deviation |                                 |                 | 6.64                         |

Based on historical statistics, the portfolio returns had a mean of 2.7 percent and a standard deviation of 6.64 percent.

$$\therefore Z = \frac{0 - 2.7}{6.64} = -0.41$$

By looking at the Cumulative Normal Distribution table, we find that the probability of observing a negative performance is Prob (R < 0%) = 0.3409=34.09%

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3. Price of Bond A = 107PVIF(5.96,1) = Rs.100.98

Price of Bond B = 7.5 PVIFA (6.1,2) + 100 PVIF (6.1, 2) = 13.7325 +88.832 = 102.5645~102.56

Price of Bond C =  $8 \text{ PVIFA}(6.28, 3) + 100 \text{ PVIF}(6.28, 3) = 21.224 + 83.3 = 104.57$

Price of Bond D =  $8.5 \text{ PVIFA}(6.35, 4) + 100 \text{ PVIF}(6.35, 4) = 29.21875 + 78.172 = 107.39075 \sim 107.39$

Price of Bond E =  $9 \text{ PVIFA}(6.5, 5) + 100 \text{ PVIF}(6.5, 5) = 37.3923 + 72.988 = 110.38$

Price of Bond F =  $9.5 \text{ PVIFA}(6.72, 6) + 100 \text{ PVIF}(6.72, 6) = 45.695 + 67.69 = 113.385 \sim 113.39$

To begin with, we should start investing in bond F so that the cash flow from this bond consisting of coupon payments and principal redemption within 6 years matches the liability. For this purpose, face value worth of  $2,00,000/1.095 = 1,82,648.4$  is required in bond F. However, since face value of each bond is Rs.100, investment can be made to the extent of face value worth of Rs.1,82,700 (in multiples of Rs.100) The amount of the cash flow from this bond in the final year will meet the obligation of the company in the final year. The following table indicates the obligation of the company in the next 6 years:

| Maturity<br>(in years) | Net cash outflow (Rs.) | Cash Inflows from Bond F<br>(Rs.) | Remaining Liabilities<br>(Rs.) |
|------------------------|------------------------|-----------------------------------|--------------------------------|
| 1                      | 10,00,000              | 17,356.5                          | 9,82,643.5                     |
| 2                      | 15,00,000              | 17,356.5                          | 14,82,643.5                    |
| 3                      | 38,00,000              | 17,356.5                          | 37,82, 643.5                   |
| 4                      | 21,00,000              | 17,356.5                          | 20,82, 643.5                   |
| 5                      | 12,00,000              | 17,356.5                          | 11,82, 643.5                   |
| 6                      | 2,00,000               | 2,00,056.5<br>(1,82,700+17,356.5) | 0                              |

Now an investment in bond E is required so that the cash flows in the fifth year matches the liability of the 5th year.

Amount of Investment in bond E should be to the face value worth of  $= \frac{11,82,643.5}{1.09} = \text{Rs.}10,84,994 \sim 10,85,000$

| Maturity<br>(in years) | Debt obligation (Rs.) | Cash Inflows from Bond E<br>(Rs.) | Remaining Liabilities<br>(Rs.) |
|------------------------|-----------------------|-----------------------------------|--------------------------------|
| 1                      | 9,82,643.5            | 97,650                            | 8,84,993.5                     |
| 2                      | 14,82,643.5           | 97,650                            | 13,84,993.5                    |
| 3                      | 37,82, 643.5          | 97,650                            | 36,84,993.5                    |
| 4                      | 20,82, 643.5          | 97,650                            | 19,84,993.5                    |
| 5                      | 11,82, 643.5          | 11,82,650<br>(10,85,000+97,650)   | 0                              |
| 6                      | 0                     | -                                 | 0                              |

Similarly investment in bond D =  $\frac{19,84,993.5}{1.085} = \text{Rs.}18,29,487 \sim 18,29,500$

| Maturity<br>(in years) | Debt obligation (Rs.) | Cash Inflows from Bond<br>D (Rs.) | Remaining Liabilities<br>(Rs.) |
|------------------------|-----------------------|-----------------------------------|--------------------------------|
| 1                      | 8,84,993.5            | 1,55,507.5                        | 7,29,486                       |
| 2                      | 13,84,993.5           | 1,55,507.5                        | 12,29,486                      |
| 3                      | 36,84,993.5           | 1,55,507.5                        | 35,29,486                      |
| 4                      | 19,84,993.5           | 19,85,007.5                       | 0                              |
| 5                      | 0                     | (1,55,507.5 + 18,29,500)          | 0                              |
| 6                      | 0                     |                                   | 0                              |

Now, Investment in bond C =  $\frac{35,29,486}{1.08} = \text{Rs. } 32,68,042.59 \sim 32,68,100$

| Maturity<br>(in years) | Debt obligation (Rs.) | Cash Inflows from Bond C<br>(Rs.) | Remaining Liabilities<br>(Rs.) |
|------------------------|-----------------------|-----------------------------------|--------------------------------|
| 1                      | 7,29,486              | 2,61,448                          | 4,68,038                       |
| 2                      | 12,29,486             | 2,61,448                          | 9,68,038                       |
| 3                      | 35,29,486             | 35,29,548                         | 0                              |
| 4                      |                       | (2,61,448 + 32,68,100)            | 0                              |
| 5                      | 0                     |                                   | 0                              |
| 6                      | 0                     |                                   | 0                              |

Now investment in bond B to the face value worth of =  $\frac{9,68,038}{1.075} = \text{Rs. } 9,00,500$

| Maturity<br>(in years) | Debt obligation (Rs.) | Cash Inflows from Bond B<br>(Rs.) | Remaining Liabilities<br>(Rs.) |
|------------------------|-----------------------|-----------------------------------|--------------------------------|
| 1                      | 4,68,038              | 67,537.5                          | 4,00,500.5                     |
| 2                      | 9,68,038              | 9,68,038                          | 0                              |
| 3                      |                       | (67,537.5 + 9,00,500.5)           | 0                              |
| 4                      |                       |                                   | 0                              |
| 5                      |                       |                                   | 0                              |
| 6                      |                       |                                   | 0                              |

Clearly, investment to the face value worth of Rs. 4,00,500.5/1.07 = Rs. 3,74,299 ~ 3,74,300 in A will fulfill the residual obligation at the end of the 1st year and our portfolio consisting of the six bonds can match the liability of the company.

Total amount invested

|       |                     |                 |
|-------|---------------------|-----------------|
| A     | 3,74,300x 1.0098 =  | 3,77,968.14     |
| B     | 9,00,500x1.0256 =   | 9,23,552.8      |
| C     | 32,68,100x 1.0457 = | 34,17,452.17    |
| D     | 18,29,500x 1.0739 = | 19,64,700.05    |
| E     | 10,85,000x 1.1038 = | 11,97,623       |
| F     | 1,82,700 x1.1339=   | 2,07,163.53     |
| Total |                     | Rs.80,88,459.69 |

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4. a.

| $R_T$ | $R_R$ | $R_O$ | $R_N$ | $(R_T - \bar{R}_T)$<br>A | $(R_R - \bar{R}_R)$<br>B | $(R_O - \bar{R}_O)$<br>C | $(R_N - \bar{R}_N)$<br>D | A*D    | B*D    | C.D    | $(R_N - \bar{R}_N)^2$ |
|-------|-------|-------|-------|--------------------------|--------------------------|--------------------------|--------------------------|--------|--------|--------|-----------------------|
| -2.62 | -0.26 | -0.16 | -1.10 | -5.02                    | -4.48                    | -3.70                    | -3.87                    | 19.45  | 17.36  | 14.34  | 14.99                 |
| 6.19  | 4.50  | 4.17  | 2.22  | 3.79                     | 0.28                     | 0.63                     | -0.55                    | -2.09  | -0.15  | -0.35  | 0.31                  |
| 0.70  | -1.83 | 3.82  | -3.21 | -1.70                    | -6.06                    | 0.28                     | -5.98                    | 10.18  | 36.24  | -1.70  | 35.82                 |
| -     |       |       |       |                          |                          |                          |                          |        |        |        |                       |
| 18.66 | -3.30 | -8.37 | -6.54 | -21.06                   | -7.52                    | -11.91                   | -9.31                    | 196.09 | 70.01  | 110.90 | 86.71                 |
| 17.96 | 1.32  | 13.75 | 9.73  | 15.56                    | -2.91                    | 10.21                    | 6.96                     | 108.23 | -20.21 | 71.03  | 48.38                 |
| 1.79  | 20.10 | 11.35 | 6.37  | -0.61                    | 15.88                    | 7.81                     | 3.60                     | -2.21  | 57.21  | 28.12  | 12.98                 |
| -6.58 | 9.46  | -8.66 | 4.13  | -8.98                    | 5.24                     | -12.20                   | 1.36                     | -12.19 | 7.12   | -16.57 | 1.85                  |

|       |       |       |       |       |       |        |        |        |        |        |        |
|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| 9.11  | 2.28  | 4.62  | 3.13  | 6.71  | -1.94 | 1.08   | 0.36   | 2.40   | -0.69  | 0.39   | 0.13   |
| 7.08  | 10.31 | 8.06  | 9.09  | 4.68  | 6.09  | 4.52   | 6.32   | 29.56  | 38.45  | 28.57  | 39.92  |
| -5.47 | -3.91 | -     | -8.86 | -7.87 | -8.13 | -15.98 | -11.63 | 91.54  | 94.60  | 185.80 | 135.25 |
| 8.55  | 9.21  | 10.83 | 11.86 | 6.15  | 4.98  | 7.29   | 9.09   | 55.95  | 45.33  | 66.28  | 82.69  |
| 10.76 | 2.79  | 15.51 | 6.43  | 8.36  | -1.43 | 11.97  | 3.66   | 30.61  | -5.24  | 43.85  | 13.42  |
| 28.80 | 50.66 | 42.48 | 33.25 |       |       |        |        | 527.53 | 340.03 | 530.66 | 472.44 |
| 2.40  | 4.22  | 3.54  | 2.77  |       |       |        |        |        |        |        |        |

Cov of stocks:

$$\text{TCS} = 527.53/11 = 47.96$$

$$\text{Reliance} = 340.03/11 = 30.91$$

$$\text{ONGC} = 530.66/11 = 48.24$$

$$\text{Market Variance (NSE Nifty)} = 472.44/11 = 42.95$$

Beta of the stocks

$$\text{TCS} = 47.96/42.95 = 1.1166$$

$$\text{Reliance} = 30.91/42.95 = 0.7197$$

$$\text{ONGC} = 48.24/42.95 = 1.1232$$

Alpha of the three stocks

$$\text{TCS} = 2.4 - 1.1166 \times 2.77 = -0.69 \%$$

$$\text{Reliance} = 4.22 - 0.7197 \times 2.77 = 2.2264\%$$

$$\text{ONGC} = 3.54 - 1.123 \times 2.77 = 0.42736 \%$$

Regression Equation of the three stocks

$$R_i = -0.69 + 1.1166R_m$$

$$R_i = 2.227 + 0.7197R_m$$

$$R_i = 0.42736 + 1.123R_m$$

b.

| R <sub>T</sub><br>A | R <sub>R</sub><br>B | R <sub>O</sub><br>C | R <sub>N</sub><br>D | Return based on<br>Regression Equations |       |       | A-E<br>(1) | B-F<br>(2) | C-G<br>(3) | (1- $\bar{1}$ ) ×<br>(1- $\bar{1}$ ) | (2- $\bar{2}$ ) ×<br>(2- $\bar{2}$ ) | (3- $\bar{3}$ ) ×<br>(3- $\bar{3}$ ) |
|---------------------|---------------------|---------------------|---------------------|-----------------------------------------|-------|-------|------------|------------|------------|--------------------------------------|--------------------------------------|--------------------------------------|
|                     |                     |                     |                     | E                                       | F     | G     |            |            |            |                                      |                                      |                                      |
| -2.62               | -0.26               | -0.16               | -1.10               | -1.92                                   | 1.43  | -0.81 | -0.71      | -1.70      | 0.64       | 0.49                                 | 2.88                                 | 0.41                                 |
| 6.19                | 4.50                | 4.17                | 2.22                | 1.79                                    | 3.82  | 2.92  | 4.40       | 0.68       | 1.25       | 19.42                                | 0.46                                 | 1.55                                 |
| 0.70                | -1.83               | 3.82                | -3.21               | -4.28                                   | -0.09 | -3.18 | 4.98       | -1.75      | 7.01       | 24.81                                | 3.06                                 | 49.06                                |
| -                   | -                   | -                   | -                   | -                                       | -     | -     | -          | -          | -          | -                                    | -                                    | -                                    |
| 18.66               | -3.30               | -8.37               | -6.54               | -7.99                                   | -2.48 | -6.92 | 10.66      | -0.82      | -1.45      | 113.65                               | 0.67                                 | 2.11                                 |
| 17.96               | 1.32                | 13.75               | 9.73                | 10.17                                   | 9.23  | 11.35 | 7.79       | -7.91      | 2.40       | 60.74                                | 62.60                                | 5.76                                 |

|       |       |        |       |       |       |       |       |       |       |        |        |        |
|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| 1.79  | 20.10 | 11.35  | 6.37  | 6.43  | 6.81  | 7.58  | -4.64 | 13.29 | 3.76  | 21.49  | 176.57 | 14.15  |
| -6.58 | 9.46  | -8.66  | 4.13  | 3.92  | 5.20  | 5.06  | 10.50 | 4.26  | 13.72 | 110.09 | 18.17  | 188.32 |
| 9.11  | 2.28  | 4.62   | 3.13  | 2.80  | 4.48  | 3.94  | 6.30  | -2.20 | 0.68  | 39.78  | 4.83   | 0.46   |
| 7.08  | 10.31 | 8.06   | 9.09  | 9.46  | 8.77  | 10.63 | -2.38 | 1.54  | -2.57 | 5.65   | 2.37   | 6.63   |
| -5.47 | -3.91 | -12.44 | -8.86 | 10.58 | -4.15 | -9.52 | 5.11  | 0.24  | -2.92 | 26.16  | 0.06   | 8.50   |
| 8.55  | 9.21  | 10.83  | 11.86 | 12.56 | 10.77 | 13.75 | -4.00 | -1.56 | -2.92 | 16.01  | 2.43   | 8.55   |
| 10.76 | 2.79  | 15.51  | 6.43  | 6.49  | 6.86  | 7.65  | 4.26  | -4.07 | 7.86  | 18.19  | 16.53  | 61.73  |
|       |       |        |       |       |       |       | -0.05 | 0.01  | 0.01  | 456.48 | 290.62 | 347.22 |

$$\overline{(A-E)} = -0.05/12 = 0.0038$$

$$\overline{(B-E)} = 0.01/12 = 0.0007$$

$$\overline{(C-E)} = 0.01/12 = 0.0007$$

Standard Deviation of Residual Return

$$TCS = (456.48/11)^{1/2} = 6.44\%$$

$$Reliance = (290.62/11)^{1/2} = 5.14\%$$

$$ONGC = (347.22/11)^{1/2} = 5.62\%$$

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## 5. Nifty STraP

The wish of every investor is to buy at lows and sell at highs. However, investors worldwide have recognized the fact that this is easier said than done. To do this, one needs the trait of equanimity, which is very difficult to attain. Equanimity means evenness of mind, which does not easily get elated or depressed.

In the world of investments, equanimity can pay rich dividends as it allows investors to overcome emotions of fear and greed. Fear prevents us from buying at lows when markets are depressed and greed prevents us from selling at highs when markets are exuberant. If one can detach investment decisions from these emotions and follow a rigorously tested quantitative discipline, equanimity in investments can be achieved. Such models are used worldwide by sophisticated and large investors.

Nifty STraP's investment comprises of equities and cash. The equity portion is invested in Nifty BeES while the cash portion in Liquid BeES. Nifty BeES replicates performance of the Nifty Index.

- Initial investment is executed as per the asset allocation of a “master portfolio” which is updated continuously.
- The Portfolio is rebalanced once a month. The date of rebalancing is client specific. No adjustments are made in between, even in case of severe volatility.

- • On the rebalancing day the model decides
  - a. Whether to increase or decrease equity: This decision is taken by comparing current market levels with the three month moving average. If the current market level is higher than the moving average, then the equity allocation is reduced and vice versa.
  - b. How much to increase or decrease equity:
    - i. Current level of market relative to its moving average.
    - ii. Current asset allocation and
    - iii. Continuation of trend.

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## Section E: Caselets

### Caselet 1

#### 6. Risks of Mutual Fund Investments

##### **1. Investor Psychology Risk**

The investor psychology is such that most of the investors, be it mutual fund investors or direct capital market investors, behave like reactionaries. They enter the market when the share prices start rising and they get panicky and exit when the share prices are falling. Because of this, there will be more than normal demand on the mutual fund manager to redeem the units. To honor the redemption demands of the exiting unit holders during the worst market times, mutual funds are forced to sell more stocks at the prevailing low prices.

##### **2. Prediction Risk**

Using various tools, methods and information, but guided by their own educated guess work, most of the mutual fund managers make market predictions and act accordingly. Nobody can predict the capital markets perfectly and can always find good investments. Similarly, the fund manager's predictions of future actions and outcomes are, of necessity, subject to error.

##### **3. Competition Risk**

Return is the ultimate measure of job performance for any investment, be it in a mutual fund or otherwise. Performance is a matter of comparison and the evaluation is intended to measure how the fund has performed vis-à-vis its past performance, peers and market. At present, mutual funds are required to report their performance including returns on a quarterly basis. Therefore, to prove that the fund is performing well, managers focus on quarterly returns. Buying and selling of stocks at the end of the quarter will be done to report better quarterly returns and to make funds' holdings look better based on the recent market action. In this process, where the competition is not really productive, fund managers incur expenses and losses that are naturally passed on to the unit holders.

##### **4. Choice Risks**

One of the basic and common problems mutual fund investors face is that all the experts recommend different schemes/funds. Naturally, all of them cannot be and will not be right (if at all one of them is). Investors are also advised to stay invested for the long-term to reap good returns. These experts also recommend different funds at different times. Of

course, to be in the well-doing fund, one needs to move from fund to fund intermittently. However, staying invested for a long-term and being in the well-doing fund cannot happen simultaneously unless and except when one is very fortunate enter a magic fund, which does better than all other funds at all times.

### **5. Cost Risks**

Mutual funds charge huge fees that they can get away with and that too in the most confusing manner possible. It would not be painful for the investors to pay for the expenses and costs of the fund when they derive satisfactory returns. But, the irony is that investors have to pay for the sales charges, annual fees, and many such other expenses irrespective of how the fund has performed.

### **6. Jargon Risks**

The newsletters and other documents that are distributed to the investors do report so much and in such a language filled with technical jargon that it will not be very easy for a naïve investor to understand and follow the report

### **7. Risk of Redemption Restrictions**

Whether informed in writing or not, normally the liquidity of the schemes' investments may be restricted by the trading volumes settlement period and transfer procedures. This is especially in the event of inordinately large number of redemption requests or of a restructuring of any of the schemes' portfolios because the time required by the fund for redemption of the units may be too large.

### **8. Judgment Risks**

Each scheme will formulate the way in which the fund allocates and manages its resources to achieve its investment objectives. This is called the investment strategy of the fund and is normally explained in the prospectus of the fund. investors are supposed to have known this strategy and have made their investment decisions accordingly. Interestingly, if the investor were capable of judging the investment strategy of the mutual fund, he himself would directly invest in the capital market formulating his own investment strategy. This implicitly means that investors may not know more than the fund manager about the investment strategy, and whatever judgment the investor makes will not be fool proof.

### **9. Management Change Risks**

It is not uncommon for a mutual fund to have changes in its management. The changes in the fund's management may affect the achievement of the objectives of the fund. This change, although may not attract the due attention of the investors, will be significant since the fund manager controls the fund's investments. In fact, if the fund's investment style changes, it may no longer be aligned with the investment objectives of the investors.

### **10. Breakpoint Risks**

Normally mutual funds charge loads such as front-end and back-end. Some mutual funds that charge front-end sales load will charge lower sales loads for larger investments. The investment levels required to obtain a reduced sales load are commonly referred to as breakpoints. Each fund company establishes its own formula to determine whether an investor is entitled to receive a breakpoint. However, the formula is published in the prospectus itself for the benefit of the investors. It is this information that sometimes puts

investors in a disadvantageous position. These breakpoints lure investors to invest huge funds to avail the discounts on volumes and end up losing focus on his planned diversification for his mutual fund investments.

### **11. Risks of Blind Diversification**

As mutual funds are typically broadly diversified, it may not be possible to track whether a fund is heavily committed to a particular area of economy at any given time or if the fund has made significant investments in companies whose shares you own in your individual accounts. This risk is called blind diversification risk and any investor would like to invest in mutual funds that concentrate in asset classes that he himself has not invested on his own.

### **12. Risks of Changes in the Regulatory Norms**

Mutual funds are constantly regulated by Sebi and investors are subject to the risk of the changes in the norms for the mutual funds.

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7.
  - i. **Buying Only on Last Year's Performance:** In any market environment, some funds produce phenomenal returns. Surprisingly, too often last year's best performers can be this year's laggards. Investors normally have a tendency to see how the fund has performed in the immediate past than studying the entire performance history of the fund.
  - ii. **Acting on Intuition and Hunches:** It is very unfortunate that even mutual fund investors invest based on intuition and hunches than by studying the performance of the funds. It is true that no one can consistently forecast market trends.
  - iii. **Over-diversifying or No Diversification:** Out of anxiousness and extra care, many investors make investments in many mutual funds expecting to derive the benefits of diversification. In the process, they end up having an over-diversified state. In contrast to this, few other investors make investments in only one mutual fund on a trial basis and the moment they don't realize their expected returns, develop reluctance to mutual funds.
  - iv. **Selling too Soon:** During some periods, the markets will favor certain funds. When the trend lacks fund performance, the group will suffer. The moment there is a halt in the growth or even if there is a slight fluctuation, investors tend to rush to sell off their investments and, thereby, lose the opportunity of gaining from the rebounds when those funds return to favor.

Being conscious of what happened to a fund's returns in the past, investors should be very careful in predicting the likely range of the fund's returns in the future. The greater is the range, the more risky are the fund's prospects.

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### **Caselet 2**

8. The strong demand for funds from cooperative entrepreneurs, a favorable public policy,

reliable legal system, economic and political stability and a well-developed financial market helped the growth of such funds in the US. Most of the emerging markets lacked almost all these factors. Lack of proper corporate governance was one of the primary factors that attributed to the slow growth rate of private equities in the emerging markets during the initial stage. Gaps were observed in the accuracy, timeliness and transparency of the financial and operating information that was provided to the investors. There was also a lack of willingness on the part of the managers to shoulder some degree of accountability in the normal course of doing business. This issue became more grueling in case of family-owned businesses. As is the case with most developed countries, this issue has found its existence in many of the emerging economies too. Family-owned business empires are built without the help of any external capital or shareholders beyond the limit of immediate family members and close friends. This brings in a lack of accountability to outside stakeholders; the interest of the firm and the individuals are difficult to segregate and company accounts are subjected to frequent distortions. Though the possibility of third party (Private Equity) financing appears attractive to such firms, the trade-offs soon call in for trouble. The problem may initiate at the primary level of raising capital where the prospects of investor may ask for detailed information, which may not be furnished by the firm's managers. The governance problems may become even more serious once the deal is finalized. The providers of capital require accurate financial and operating information on a continuous basis. They further ask for their active participation in the major decisions of the company, which may have the possibility of affecting the future results. This essentially means the restructuring of the Board of Directors. In reality, most of the emerging markets experience a scenario whereby the minority shareholders are not vested with enough powers to influence the decisions pertaining to the company.

Apart from governance related issues, the existence of a substantially weak legal system in most of the emerging economies provides very little solace for private equity funds to resolve their disputes. Observations reveal that initially private equities in emerging markets have experienced some trouble; irrespective of how perfect the signed document is, there is little legal recourse in case of the emergence of any conflict of interest with the management. Lack of adequate shareholder protection has compounded the entire problem. Shareholder activism has remained mostly on the pages of books. Some of the investors have even invested when assurance of a majority control was provided.

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9. A private equity fund, like a hedge fund, is an unregistered investment vehicle in which investors pool money to invest in securities. Private equity funds concentrate their investments in unregistered (and typically illiquid) securities. Both private equity funds and domestic hedge funds are typically organized as limited partnerships. Because these entities rely on an exemption from registration of the offer and sale of their securities, the managers/sponsors of both private equity funds and hedge funds solicit investors directly, or through a registered broker-dealer, rather than through general solicitation, general advertising or a public offering of the securities. The investors in private equity funds and hedge funds typically include high net worth individuals and families, pension funds, endowments, banks and insurance companies. Like hedge funds, many private equity funds establish offshore "mirror" funds that are typically managed by the general partner of the companion domestic fund and have similar investments.

Private equity funds, however, differ from hedge funds in a number of significant ways.

Private equity investors typically commit to invest a certain amount of money with the fund over the life of the fund, and make their contributions in response to “capital calls” from the fund’s general partner. Because private equity funds typically do not retain a pool of uninvested capital, their general partners make a capital call when they have identified or expect to identify a portfolio company in which the private equity fund will invest. A hedge fund investor, by contrast, generally can decide when and how much to invest in the fund. Private equity funds are long-term investments, provide for liquidation at the end of the term specified in the fund’s governing documents, and offer little, if any, opportunity for investors to redeem their investments.

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### Caselet 3

10. Portfolio rebalancing means to shift positions to some other stock or to some other instrument of the same stock. The reasons behind it can be varied and many. If some other stock is giving better returns, then the fund may switch position to that counter. Also, if some existing counter is available cheaper in the derivatives market, it can also resort to the same. The idea behind it is to keep the cost of managing portfolio lower and thus enhance the NAVs.

Portfolio rebalancing can be done in three ways:

#### **Buying at lower price using futures.**

In case of futures, if some stock is trading at a discount (i.e., the price in the futures market is lower than the price in the cash market), then a fund can buy it from the futures market rather than the cash market. The limitation in this case would be that mutual funds would not get the benefit of dividends or any other corporate action.

For example, on September 9, 2005 the price of Bharti in cash market was Rs.331 while in the futures market it was quoting at Rs.328. If a mutual fund wants to take position in Bharti, they can buy it in futures market, thus getting a discount of around 0.9%. The cost of taking this position would be lower as compared to that in cash market as one is required to pay the margin money only, which in this case would work out to 16-17% of the exposure.

#### **Converting cash position to long call**

In case of options, if a stock is trading at an all-time high or any up move from existing levels seems dicey, the fund can sell its holding in that stock and replace it and buy calls. Thus, if there is any up move it can benefit out of it and if it doesn’t move as expected the risk is only to the tune of the premium paid, which is around 3-5% of the value, which would be lesser than the cost of selling the stocks and buying them back later.

For example, on July 26, 2005 SBIN reached Rs.755, which was a new high price at that time. If a fund is skeptical about further price movements, it can sell its stake in cash market and replace it by calls. The 800-strike call of SBIN expiring on August 25, 2005 was quoting at Rs.8. On September 11, 2005 the stock reached Rs.824 thus recording gains of Rs.69, i.e., 9%. Along with it, the call price increased to Rs.39, thus gaining Rs.31, i.e., 387.5% or around four times. So, though the returns in absolute terms would be less, returns in percentage terms are much higher. But, the most important thing is that, the mutual fund could see the upward movement with lower risk exposure.

## Beta management

Derivatives can be used for portfolio beta management. The fund can increase its exposure to stock or reduce the exposure to a stock using derivatives and thus manage the beta.

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11. Suppose the futures price of a stock is more than its cash price, the markets are said to be in contango, i.e., the futures are quoting at a premium to cash. Thus, mutual funds can sell the security in futures market and buy it in cash market, by locking certain returns. Generally, these returns are in the band of 8-12% annualized. As the expiry approaches, the futures price and cash price tend to converge. This is when one can unwind the position. In case one wants to carry forward his position, he can keep the cash position *status quo*, buy back the near month futures contract and sell the mid-month contract. Thus, he has a similar position like he had in the previous expiry.

Suppose the futures price of stock is less than its cash price, markets are said to be in backwardation (i.e., the futures are quoting at a discount to cash). Thus, if a fund is having stocks of such counters, which are in backwardation, it can sell the stocks in the cash market and buy them in futures. This position shall be similarly unwounded or rolled over as per the market conditions.

Arbitrage can be done in various methods:

- Single Stock Arbitrage
  - Buy Cash – Sell Futures
  - Buy Future – Sell Cash
- Index Arbitrage
  - Buy Index – Sell Index Stocks in cash or futures
  - Sell Index – Buy Index Stocks in cash or futures

Arbitrage can be done using indices also; the only difference is instead of single stock, one would be dealing with a basket of stocks. So, a basket of stocks on an index would be bought/sold in cash/futures and the index would be sold/bought. There are certain problems as far as index futures are concerned in terms of slippages, basis risk, execution problem, transaction costs, impact costs and stock limits.

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