

Question Paper

Portfolio Management and Mutual Funds – II (252) : July 2002

Part D : Case Study (50 Points)

- This part consists of questions with serial number 1 - 6.
- Answer all questions.
- Points are indicated against each question.
- Do not spend more than 80 - 90 minutes on Part D.

Case Study

Read the case carefully and answer the following questions:

1. Explain the concept of tracking error and also discuss the causes for tracking error. (2 + 6 = 8 points)
2. What could be the reasons for selecting Sensex and Nifty as the benchmarks by HDFC Index Fund? What is the rationale behind forming Sensex Plus Plan? (5 + 5 = 10 points)
3. Briefly outline the investment objectives and constraints for Mr. Anand and also write an investment policy based on these objectives and constraints. (8 points)
4. Calculate the amount of tracking error observed in the Sensex Plan during the last 12 weeks. (6 points)
5. The Sensex Plus Plan intends to actively manage 10-20% of its corpus by investing in stocks other than Sensex stocks. If the AMC expects a minimum return of 18% from its active portfolio, construct an optimal portfolio using the quadratic programming approach. (12 points)
6. Why do you think index funds are not so popular in India? What could be done to popularize them? (6 points)

Mr. Anand is a General Manager in a private bank. He is 40 years old and has one daughter and a son. His daughter, Shalini, is doing MBA from a reputed business school and wish to join some MNC after completing her masters degree. His son, Gaurav, is presently doing his graduation and wishes to go abroad for higher studies, which is expected to cost Rs.7 lakhs. Mrs. Anand is a school teacher and her age is 38 years. Mr. Anand along with his family lives in house provided by his employer. Mr. Anand is thinking about marriage of his daughter in another two years for which expenses are expected to be about Rs.5 lakhs. Current savings of Mr. and Mrs. Anand are Rs.25 lakhs. Mr. Anand is very cautious about the safety of his capital and wants only a normal returns on his capital. He contacted a financial consultant, Mr. Majumdar, for advice on the investments he should make so that his future needs are satisfied. Mr. Majumdar strongly advised him to invest Rs.15 lakhs in AAA corporate bonds and Gilt funds and the balance in an Index fund. Mr. Anand is looking at an Index fund from HDFC Mutual Fund.

HDFC MUTUAL FUND

HDFC Mutual Fund was constituted as a trust in accordance with the provisions of the Indian Trusts Act, 1882, by the sponsor, as per the terms of the Trust Deed. The Trust Deed was registered under the Indian Registration Act, 1908. The Mutual Fund has been registered with SEBI since June 30, 2000.

The Sponsor - Housing Development Finance Corporation Limited (HDFC)

HDFC was incorporated in 1977 as the first specialized housing finance institution in India. HDFC provides financial assistance to individuals, corporates and developers for the purchase or construction of residential housing. It also provides property related services (e.g. property identification, sales services and valuation), training and consultancy.

HDFC is a professionally managed organization with a board of directors consisting of eminent persons representing various fields including finance, taxation, construction, urban policy and development.

The policy directions of the Board of Directors are implemented by a senior management team comprising the Chairman, Managing Director, Executive Directors and General Managers.

Strategic Alliance

HDFC entered into an agreement with Standard Life Investments Limited, U.K., for its mutual fund foray, on October 29, 1999. HDFC Mutual Fund proposes to offer a wide range of investment products to the eligible retail as well as institutional investors and will be able to leverage on HDFC's investment management expertise as well as its brand, distribution capabilities and existing client base.

The present shareholding pattern of the AMC is as follows :

Particulars	% of the paid up share capital
HDFC	60.10
Standard Life Investments Limited	39.90

The Asset Management Company

HDFC Asset Management Company Limited (AMC) was incorporated under the Companies Act, 1956, on December 10, 1999, and was approved to act as an Asset Management Company for the Mutual Fund by SEBI on July 3, 2000.

In terms of the Investment Management Agreement, the Trustee has appointed HDFC Asset Management Company Limited to manage the Mutual Fund. The paid up share capital of the AMC is Rs. 20 crore.

The AMC is managing eight open ended schemes launched by the Mutual Fund viz. HDFC Growth Fund (HGF), HDFC Balanced Fund (HBF), HDFC Income Fund (HIF), HDFC Liquid Fund (HLF), HDFC Tax Plan 2000 (HTP), HDFC Children's Gift Fund (HDFC CGF), HDFC Gilt Fund (HGILT) and HDFC Short Term Plan (HSTP).

The AMC is also managing the respective plans of HDFC Fixed Investment Plan, which is a closed ended Income Scheme.

HDFC Index Fund

Name of the Scheme	HDFC Index Fund
Structure	Open Ended Index Linked Scheme
Plans	The Scheme offers investors 3 plans, each with its own NAV, namely, Nifty Plan SENSEX Plan SENSEX Plus Plan
Features	Nifty Plan: The objective of this plan is to generate returns that are commensurate with the performance of the Nifty, subject to tracking errors. SENSEX Plan: The objective of this plan is to generate returns that are commensurate with the performance of the SENSEX, subject to tracking errors. SENSEX Plus Plan: The objective of this plan is to invest 80 to 90% of the net assets of the plan in companies whose securities are included in SENSEX and between 10% & 20% of the net assets in companies whose securities are not included in the SENSEX.
Application Amount	Minimum of Rs. 500 per application and in multiples of Rs. 100 thereof under each plan
Initial Offer Price	Rs. 10 per unit for cash at par
Target Amount	The Mutual Fund seeks to raise a minimum subscription amount of Rs.1.00 lakh under each plan during the initial offer period of the scheme and would retain any excess subscription collection
Initial Issue Expenses	The initial issue expenses with respect to the launch of this scheme will be borne by the AMC. An exit load of 0.75% will be payable if units allotted under the respective plans during the initial offer period are redeemed / switched-out within 1 year from the date of allotment. For units purchased after the closure of the initial offer period, entry and / or exit loads may be imposed / modified prospectively, as decided by the AMC.
Flexible Investment Option	The Mutual Fund will allow investors the flexibility to alter the allocation of their investments amongst the scheme(s) / plan(s) offered by the Mutual Fund (subject to completion of lock-in period, if any, of the units of the scheme(s) from where the units are being switched) in order to meet their changing investment needs or risk profiles, by switching between the scheme(s) / plan(s) of the Mutual Fund.
Liquidity	The scheme being offered through this offer document is an open ended Scheme. The scheme will offer for sale and repurchase units at NAV based prices on every business day on an ongoing basis, commencing not later than 30 days from the closure of Initial Offer Period. In normal circumstances, the Mutual Fund will endeavor to despatch the redemption cheque / draft within 3 business days from the acceptance of the Redemption request.

The Mutual Fund does not guarantee or assure any returns.

Except for the actively managed part of the SENSEX Plus Plan, the scheme attempts to track the respective indices and it would primarily invest in the securities included in its underlying indices regardless of their investment merit. The scheme may be affected by a general decline in the Indian markets.

Special Considerations

Performance of the BSE SENSEX / S&P CNX Nifty Index will have a direct bearing on the performance of the respective Plans. In the event the BSE SENSEX / S&P CNX Nifty Index is dissolved or is withdrawn by The Stock Exchange, Mumbai / India Index Services & Products Limited (IISL), the Trustee reserves a right to modify the respective plans so as to track a different and suitable index and appropriate intimation will be sent to the unit holders of the respective plans.

Tracking errors are inherent in any index fund and such errors may cause the respective plans to generate returns which are not in line with the performance of the BSE SENSEX / S&P CNX Nifty or one or more securities covered by / included in the BSE SENSEX / S&P CNX Nifty.

IISL undertakes periodic reviews of the fifty securities that are represented in the Nifty and from time to time may exclude existing securities or include new ones. Similarly, the BSE may exclude existing securities or include new ones. In such an event, the respective Plans will endeavor to reallocate its portfolio to mirror the changes. However, the reallocation process may not occur instantaneously and permit precise mirroring of the BSE SENSEX / Nifty during this period.

In case of investments in derivative instruments like index futures, the risk / reward would be the same as investments in portfolio of shares representing an index. However, there may be a cost attached to buying an index future. Further, there could be an element of settlement risk, which could be different from the risk in settling physical shares and there is a risk attached to the liquidity and the depth of the index futures market as it is a relatively new market.

In the event the S&P CNX Nifty / SENSEX, as the case may be, is dissolved or is withdrawn by IISL / BSE, respectively or is not published due to any reason whatsoever, the Trustee reserves the right to modify the respective plans so as to track a different and suitable index or to suspend tracking of the Nifty / SENSEX till such time it is dissolved / withdrawn or not published and appropriate intimation is sent to the unit holders of the respective plans. In such a case, the investment pattern will be modified suitably to match the composition of the securities that are included in the new index to be tracked and the respective Plans will be subject to tracking errors during the intervening period.

INVESTMENT PATTERN

Nifty Plan:

The net assets of the plan will be invested predominantly in stocks constituting the S&P CNX Nifty and / or in exchange traded derivatives on the S&P CNX. This would be done by investing in almost all the stocks comprising the S&P CNX Nifty in approximately the same weightage that they represent in the S&P CNX Nifty Index and / or investing in derivatives including futures contracts and options contracts on the S&P CNX Nifty Index. A small portion of the net assets will be invested in money market instruments permitted by SEBI / RBI including call money market or in alternative investment for the call money market as may be provided by the RBI, to meet the liquidity requirements of the Plan.

SENSEX Plan:

The net assets of the plan will be invested predominantly in stocks constituting the SENSEX and / or in exchange traded derivatives on SENSEX. This would be done by investing in almost all the stocks comprising the SENSEX in approximately the same weightage that they represent in the SENSEX and/or investing in derivatives including futures contract and options contracts on the SENSEX. A small portion of the net assets will be invested in money market instruments permitted by SEBI/RBI including call money market or in alternative investment for the call money market as may be provided by the RBI, to meet the liquidity requirements of the plan.

SENSEX Plus Plan:

The net assets of the plan would be invested in such a manner that 80% to 90% of the net assets are invested in almost all stocks constituting the SENSEX in approximately the same weightage that they represent in the SENSEX. The balance 10% to 20% of the net assets of the plan would be invested in stocks that do not form part of the SENSEX in a manner that individual stock exposures do not exceed the SEBI stipulated limits. A small portion of the net assets will be invested in money market instruments permitted by SEBI/RBI including call money market or in alternative investment for the call money market as may be provided by the RBI, to meet the liquidity requirements of the Plan.

The following table provides the asset allocation (as a % of Net Assets) of the respective plans' portfolio.

Nifty Plan:

Instrument	Normal Allocation	Risk Profile of the Instrument
Securities covered by the Nifty	95 to 100	Medium to High
Cash & money market instruments, including money at call but excluding subscription and redemption cash flow	0 to 5	Low to Medium

SENSEX Plan:

Instrument	Normal Allocation	Risk Profile of the Instrument
Securities covered by the Sensex	95 to 100	Medium to High
Cash & money market instruments, including money at call but excluding subscription and redemption cash flow	0 to 5	Low to Medium

SENSEX Plus Plan:

Instrument	Normal Allocation	Risk Profile of the Instrument
Securities covered by the Sensex	80 to 90	Medium to High
Securities other than covered by SENSEX	10 to 20	Medium to High
Money market instruments, convertible bonds & cash including money at call but excluding subscription and redemption cash flow	0 to 5	Low to Medium

The asset allocation pattern indicated above may change from time to time, keeping in view market conditions, market opportunities, applicable regulations and political and economic factors. It must be clearly understood that the percentages stated above are only indicative and not absolute and that they can vary substantially within the maximum and minimum allocation limits, depending upon the perception of the investment manager, the intention being at all times to seek to protect the interests of the unit holders. Such changes in the investment pattern will be for short term and defensive considerations.

Tracking Error

While the objective of the scheme is to closely track the respective indices, the performance may not be commensurate with the performance of the Nifty / SENSEX on any given day or over any given period. Such variations are commonly referred to as the tracking error.

Investment Decisions

The scheme is largely passively managed, except for the SENSEX Plus Plan where 10-20% of the net assets of the plan would be actively managed. Investment decisions with regard to Index investing would primarily be related to portfolio re-balancing based on change in weightage of stocks and the inflows / outflows in the Scheme.

The Investment Committee comprises of the Managing Director, the Chief Investment Officer and the Compliance Officer. In addition to the above process adopted for Investments / Disinvestments, periodic presentations will be made to the Board of Directors of the AMC & Trustee company to review the performance of the Scheme.

Risk Control

For the SENSEX Plan, the Nifty Plan and the proportion of the SENSEX Plus Plan that would be managed just as the SENSEX Plan, risks would be the impact cost on securities, the delayed communication of weightage changes by the index service providers and the delayed calculation of net change in assets of each of the plans, amongst others.

It is proposed to manage the risks by placing limit orders for basket trades and other trades, proactive follow-up with the service providers for daily change in weights in the respective indices as well as monitor daily inflows and outflows to and from the Fund closely.

While these measures are expected to mitigate the above risks to a large extent, there can be no assurance that these risks would be completely eliminated.

Risk control for the actively managed portion of the SENSEX Plus Plan would entail setting limits for single stock and single industry exposures by the investment committee for this portion. However, it should be clearly understood that investment restrictions for actively managed funds would not apply to the SENSEX Plus Plan.

Portfolio Turnover

As the Scheme will follow a passive investment strategy for the Nifty Plan and the SENSEX Plan the endeavor will be to minimize portfolio turnover subject to the exigencies and needs of the Nifty Plan and the SENSEX Plan. Generally, as the scheme is open-ended, turnover will be confined to rebalancing of portfolio on account of

new subscriptions, redemptions and change in the composition of the S&P CNX Nifty Index and BSE SENSEX. Consequently, it is difficult to estimate with any reasonable measure of accuracy, the likely turnover in the portfolio.

The fund managers are considering the following three stocks for formation of an active portfolio for the Sensex Plus plan.

	Expected Return	Variance Covariance Matrix (%) ²		
		Hind Cements	Shanta Biotech	Beta chemical
Hind Cements	21%	256	415	325
Shanta Biotech	18.5%	415	225	339
Beta chemical	15%	325	339	289

Mr. Anand has also collected the following information about the Sensex and corresponding NAV of the Sensex Plan.

Week	Weekly closing price of the Sensex	Weekly closing NAV of the Sensex Plan (Rs.)
1	3125.35	11.25
2	3105.45	10.92
3	3127.50	11.02
4	3201.25	11.52
5	3179.25	11.32
6	3256.39	12.05
7	3329.75	13.01
8	3296.25	12.65
9	3245.10	12.25
10	3325.23	12.95
11	3391.05	13.15
12	3401.29	13.45

END OF PART D

Part E : Caselets (50 Points)

- This part consists of questions with serial number 7 - 13.
- Answer **all** questions.
- Points are indicated against each question.
- Do not spend more than 80 - 90 minutes on Part E.

Caselet 1

Read the following caselet carefully and answer the following questions:

- Discuss why Systematic Withdrawal Plans (SWPs) have caught the fancy of the Mutual Fund industry during the recent months.
(7 points)
- Discuss the differences between Automatic Encashment Plan (AEP) and Systematic Withdrawal Plan (SWP)?
(5 points)
- Compare Systematic Investment Plan (SIP) with Systematic Withdrawal Plan. Explain why SWPs are not as popular as SIPs.
(6 points)

The 2002-03 budget announcements have rendered Mutual Funds an undesirable investment option. But the way out is a switch to the growth option as against the dividend option of the funds. This saves the investor from the

liability of a dividend tax. At the same time, the investor can continue to have a steady source of income via the Systematic Withdrawal Plans (SWP) of the growth options of these funds.

Systematic withdrawal plans (SWP) have caught the fancy of the Mutual Fund industry after the budget for 2002-03 proposed to levy a tax on dividends from Mutual Funds. While SWP has been in vogue for some time, asset management companies have pulled it now from the cold storage to beat the budget blues and are exhorting investors to invest in the option. SWP is ideal for investors, who need a regular income from their monthly income plan or bond fund.

Under SWP, investors can redeem a fixed sum on a periodic basis based on their needs and investment goals. A variant of SWP is automatic encashment plan, where investors can withdraw the capital appreciation in net asset value. However, AEP is not suited for those investors who need regular income since there could be certain time periods where either there is no capital appreciation or gains are not significant. Most funds offer SWP and AEP on a monthly or quarterly basis. Withdrawals are normally processed, based on the net asset value on the last business day of the month and cheques are sent on the first of every month.

Caselet 2

Read the following caselet carefully and answer the following questions:

- 10.** What are the functions of a benchmark? What are the properties of an ideal benchmark?
(8 points)
- 11.** The suggested benchmark for MIPs has a 85% weightage to the Crisil Composite Bond Index and 15% weightage to the Nifty. What is the rationale behind this composition?
(5 points)
- 12.** The article says that computation of composite ICICI Securities Bond Index is based on combination of the outstanding issuance of each security weighted by the turnover of the security in the last month. Discuss pros and cons of turnover being used as weighting factor.
(5 points)

Investors in debt schemes of Mutual Funds (MFs) will soon have a new way to measure the performance of fund managers to whom they have entrusted their money. Instead of imperfect benchmarks like a bank fixed deposit rate, MFs are all set to introduce benchmarks for the different types of debt schemes in the market which will enable investors to compare how these funds have performed.

The benchmarks have been finalized by the Association of Mutual Funds in India (AMFI) based on inputs received from a committee headed by Prudential ICICI AMC managing director Shailendra Bhandari. "While in the case of equity funds a number of benchmarks like the BSE Sensex and the S&P CNX Nifty are available there has been a lack of relevant benchmarks for debt funds. We have therefore commissioned creation of relevant benchmarks from Crisil.com and ICICI Securities," said Mr Bhandari.

New indices have been formulated for Balanced Funds, Income Funds, Monthly Income Plans (MIPs), gilt funds and liquid funds.

In the case of liquid funds, the index comprises a commercial paper (CP) component with a 60% weightage and a inter-bank call money market component weightage of 40%. "The CP component of the index will be computed using the weighted average issuance yield on new 91-day CPs issued by top rated manufacturing companies," said a Crisil.com spokesperson, who has designed the index.

In the case of bond funds, a composite bond index has been prepared by Crisil.com with a 55% weightage for corporate bonds, 30% to gilts, 10% to call and 5% to CPs. The index's 55% bond component is split based on a 40 point share of AAA rated bonds and 15 point share of AA rated bonds.

"The idea behind the construction of these indices is to have indices which mirror the actual portfolio of the MFs so as to provide a relevant benchmark for investors to compare," said AMFI chairman AP Kurian. The industry association's move follows the move by the Securities and Exchange Board in India to usher in truth in labeling standards on the lines of those adopted by the Securities and Exchange Commission in the US.

The index developed for balanced funds devotes a 60% weight to the S&P CNX Nifty and 40% to the Crisil Corporate Bond Index. In the case of MIPs the benchmark has a 85% weight to the Crisil Composite Bond Index and a 15% weightage to the Nifty.

"We have also asked ICICI Securities to formulate a composite index, a short-term index, a medium-term index and a long-term index for comparing the performance of gilt funds," said Franklin Templeton Investments chief investment officer Nilesh Shah, who was a member of the Amfi committee which finalized the benchmarks.

The methodology used for computing these gilt fund indices will be the same as that used for computing the composite ICICI Securities Bond Index which is based on a combination of the outstanding issuance of each security weighted by the turnover of the security in the last one month.

The short-term gilt index will have as its constituent eligible securities with a maturity of up to three years, while the medium-term index will have traded gilts with a maturity of between three to eight years. The long-term gilt index will comprise eligible securities with a tenure above eight years.

Caselet 3

Read the following caselet carefully and answer the following questions:

13. The dynamic nature of interest rate movements has prompted AMC's in India to launch floating rate income funds. What are the disadvantages of investing in a floating rate scheme? And for whom these schemes are suitable?

(7 points)

14. Why the floating rate bonds are considered to be a better investment vehicles than the fixed rate bonds. What are the attributes that differentiate floating rate bonds from fixed rate bonds?

(7 points)

Floating rate securities are gaining popularity in India. In the past, the interest rates were administered. Liberalization of the economy has necessitated for a system of market determined interest rate. The fact that the interest rates are now ascertained by the market, it makes the prediction of the interest rates an increasingly difficult task. Considering all such changes, the financial market instruments also had to be engineered to fit into the new demands. Thus the concept of Floating Rate Bonds (FRBs) came forth. Floating Rate Bonds are different from the bonds which promise a fixed rate of interest. The rates of interest payable to the holders of Floating Rate Bonds are rearranged at periodic intervals. The working of the FRBs is such that if the prevailing rates of interest at the market place is higher, the instrument automatically adjusts itself, benefiting the investor. On the other hand, if the market rates are lower, then the instrument adjusts itself on the lower side, thus benefiting the issuer. The Floating Rate Bonds (FRBs) are priced against one of the benchmark interest rates and pay a few basis points more than the benchmark. Consider a FRB with an interest structure where it promises 50 basis points spread over the lending rate of banks on a quarterly basis; annually the investor in such an instrument would earn about 2 percent returns over and above the benchmark rate.

Recently Templeton launched Floating Rate Income Fund (TFIF). TFIF draws inspiration from the fact that the interest rates in an economy can not be foretold accurately, hence it is of no use to predict the same. Rather, the best way is to move as per the flow and derive consistent returns from the portfolio by investing in a basket of securities which provide a predictable stream of cash flows by investing in such products. The scheme offered by the AMC is an open ended scheme with an objective to invest about 70 percent-100 percent of the corpus in floating rate instruments. Thus, the investors of this scheme would have an abridged possibility of loss arising out of unfavorable movement of interest rate. Since the rates of interest on the underlying portfolio of bonds would be reset periodically against the benchmark, the fluctuation in the NAV of this scheme would not be as much as it would be in case of a pure debt scheme where similar care is not taken. Besides all these promised benefits, the product has all the normal benefits of investments in a mutual fund like indexation benefits on the long-term capital gains and no TDS on the redemption amount for the resident investors of such schemes.

END OF PART E

END OF QUESTION PAPER

Suggested Answers

Portfolio Management and Mutual Funds – II (252) : July 2002

Part D : Case Study

1. Tracking error refers to the standard deviation of the difference in the returns between the selected benchmark and the respective index fund. This error gives an idea about how much higher or lower return an index fund has produced with respect to the benchmark.

The main causes of the tracking error are:

- i. Tracking error may arise if there is any delay in buying and selling of required stocks because of settlement problem, realization of sales amount or delay in getting the securities credited.
 - ii. Sensex and NIFTY at any point of time reflects the previous day closing prices of the constituent securities at the Bombay Stock Exchange and National Stock Exchange of India. The different plans of index funds may be trading the market index stocks at different times and hence price at which they may be trading may not be equal to the closing price of the every stock on that particular day at BSE and NSE. The index fund plans can also buy and sell the stocks at different stock exchanges where prices will not be exactly same as closing prices at BSE and NSE.
 - iii. If the index plans are not be able to acquire the desired stocks to replicate the Sensex or NIFTY, tracking error of the index fund will increase.
 - iv. One of the most important causes of the tracking error is transaction and other costs such as brokerage custodian fees, investment management fees etc.
 - v. If there is any addition or deletion of stocks in the Sensex or NIFTY, index plans cannot immediately reallocate the fund to the desired stocks and this will also lead to tracking error.
2. a. There are numerous reasons for selecting Sensex and NIFTY as benchmarks by HDFC index fund. Sensex and NIFTY are the most important stock market indices in Indian capital market. Sensex represent movements of 30 stocks which are representative of their respective industry. Similarly, NIFTY is a benchmark based on the movements of 50 ideal stocks chosen from various industries. Investing in these kind of stocks assures a reasonable return to the investors. Investment in NIFTY and Sensex stocks provide diversification benefit to the index fund manager. Return of an index fund based on these stock indices will not be dependent on the performance of one or two stocks. As these two indices consist of 30 and 50 stocks, constitution of the index fund is relatively easy. If an index fund manager wants to select BSE 100 or Crisil 500 as its benchmark index it has to track 100 or 500 stocks which will be a very painful and cumbrance task. Again building index fund based on BSE 100 and Crisil 500 will attract large amount of transaction cost because fund managers have to buy or sell a huge number of stocks. Selection of NIFTY and Sensex greatly reduces transaction costs. Apart from these benefits investors have got lot of confidence in these two indices and thus selecting them as benchmark index induces greater investor confidence.
- b. Index funds are passively managed funds as they intend to replicate their chosen benchmarks. An index fund manager does not have any choice in the selection of stocks as he has to follows the movements of the selected benchmark. The idea behind constructing Sensex plus plan is to utilize the benefits of active portfolio management techniques. If some good value stocks are available outside the Sensex and NIFTY the fund manager can take position in them. However, Sensex plus plan which intends to invest 10% - 20% of its funds in stocks other than Sensex can invest in these stocks and gain from their abnormal rise in the price of stocks. This plan has got flexibility of using market timing or stock selection techniques to generate more return than Sensex and NIFTY plans. Sensex plus plan is a blend of index and growth fund where tilt towards index fund is high. Clearly, this plan gives the fund manager an opportunity to pick up undervalued stocks and utilize market timing to add more value to the index based returns.

3. **Investment Objective**

Mr. Anand is occupying a good position and his wife is also working. His financial position seems to be good. He is only 40 years old and sizeable working life is left for him. His liquidity need's are quite high because he has to provide money to his children who are pursuing their studies. Mr. Anand has to think about his daughter's marriage and son's higher studies. These two commitments are foremost important to him as he would not like to face any risk.

Therefore, safety of the capital should be the prime objective of Mr. Anand. If any loss occurs to his capital base, Mr. Anand will not be in a position to execute his plans of son's education and daughter's marriage. Mr. Anand should be willing to receive average return from his investment as he is not in a position to even think about abnormal returns. This is because extraordinary return will entail more risk to his capital base.

Investment Constraints:

Liquidity

Liquidity needs of Mr. Anand are very high

Time horizon

The time horizon for the investment portfolio of Mr. Anand is medium to long term. Medium term investment will cater to his two important obligations in the form of daughter's marriage and son's education. and long term investment should provide enough funds to buy the house for him and also sufficient money to lead a good post-retirement life.

Tax

Tax burden is a very important consideration to Mr. Anand. He comes under highest tax-bracket. The investment portfolio of Mr. Anand should provide more capital gain and less short term benefits so that higher tax imposed on short term income can be compensated against lower capital gain tax.

Risk Consideration

The risk taking capacity of Mr. Anand is low. Although he is only 40 years old his immediate obligations are very important to him. He may not be in a position to withstand any depreciation in his capital. His liquidity needs are also high.

Investment Policy

An ideal investment policy of Mr. Anand calls for a balance between maximizing return and the safety of capital. Mr. Anand requires a healthy regular income as well as good appreciation in his capital base. The optimal investment period is medium to long term. The portfolio manager designing the investment policy of Mr. Anand has to make a trade-off between the capital appreciation and regular income.

4.

Week	Weekly closing Price of the Sensex	Sensex Return (X) (1)	Weekly closing NAV of the Sensex Plan	Return of the Sensex Plan (2)	Excess Return X = (2)-(1)	$(X - \bar{X})^2$
1	3125.35	—	11.25	—	—	—
2	3105.45	-0.006367	10.92	-0.029333	-0.022966	0.001039
3	3127.50	0.0071	11.02	0.009157	0.002057	0.000052
4	3201.25	0.023581	11.52	0.045372	0.021790	0.000157
5	3179.25	-0.006872	11.32	-0.017361	-0.010488	0.00039
6	3256.39	0.024264	12.05	0.064487	0.040224	0.000958
7	3329.75	0.022528	13.01	0.07966	0.057140	0.002292
8	3296.25	-0.010061	12.65	-0.027671	-0.017610	0.000722
9	3245.10	-0.015518	12.25	-0.031620	-0.01610	0.000644
10	3325.23	0.024693	12.95	0.057142	0.032450	0.000537
11	3391.05	0.019794	13.15	0.015444	-0.004350	0.000185
12	3401.29	0.00302	13.45	0.022813	0.019793	0.000111

$$\text{Average excess return} = \bar{X} = \frac{0.1019382}{11} = 0.009268$$

$$\Sigma(X - \bar{X})^2 = 0.007088$$

$$\begin{aligned} \text{Tracking error observed in the last 12 weeks} &= \frac{\sqrt{\Sigma(X - \bar{X})^2}}{10} \\ &= \frac{\sqrt{0.007088}}{10} \\ &= 0.02662 = 2.662\% \end{aligned}$$

5. Let us assume that x_1 , x_2 and x_3 are the proportions of funds to be invested in the equity stocks of Hind Cements, Shanta Biotech and Beta Chemical.

Minimize (Total risk of portfolio)

$$Z = 256x_1^2 + 225x_2^2 + 289x_3^2 + 2 \times 415 \times x_1x_2 + 2 \times 339 \times x_2x_3 + 2 \times 325 \times x_1x_3 \quad (A)$$

Subject to

$$21x_1 + 18.5x_2 + 15x_3 = 18 \quad (B)$$

$$x_1 + x_2 + x_3 = 1 \quad (C)$$

We should incorporate the return constraint (B) as a part of the objective function (A) using the Lagrangian Constraint λ

Now using equation (C)

$$x_3 = 1 - x_1 - x_2$$

$$\begin{aligned} Z &= 256x_1^2 + 225x_2^2 + 289(1 - x_1 - x_2)^2 + 2 \times 415 \times x_1x_2 + 2 \times 339x_2(1 - x_1 - x_2) + 2 \times 325 \times x_1(1 - x_1 - x_2) \\ &= 256x_1^2 + 225x_2^2 + 289(1 + x_1^2 + x_2^2 - 2x_1 - 2x_2 + 2x_1x_2) + 830x_1x_2 + 678x_2(1 - x_1 - x_2) + 650x_1(1 - x_1 - x_2) \\ &= 256x_1^2 + 225x_2^2 + 289 + 289x_1^2 + 289x_2^2 - 578x_1 - 578x_2 + 578x_1x_2 + 830x_1x_2 + 678x_2 - 678x_1x_2 - 678x_2^2 + 650x_1 - 650x_1^2 - 650x_1x_2 \\ &= x_1^2(256 + 289 - 650) + x_2^2(225 + 289 - 678) + x_1x_2(578 + 830 - 678 - 650) + x_1(650 - 578) + x_2(678 - 578) + 289 \\ &= 105x_1^2 - 164x_2^2 + 80x_1x_2 + 72x_1 + 100x_2 + 289 = 0 \quad (D) \end{aligned}$$

Now using equation (B) and (C)

$$21x_1 + 18.5x_2 + 15(1 - x_1 - x_2) = 18$$

$$21x_1 + 18.5x_2 + 15 - 15x_1 - 15x_2 = 18$$

$$6x_1 + 3.5x_2 - 3 = 0 \quad (E)$$

Using the lagrangian multiplier, the revised objective function is

$$Z = -105x_1^2 - 164x_2^2 + 80x_1x_2 + 72x_1 + 100x_2 + 289 + \lambda(6x_1 + 3.5x_2 - 3) = 0$$

Now for optimization setting first derivatives with respect to x_1 x_2 x_3 equal to zero we get

$$\frac{\delta Z}{\delta x_1} = -210x_1 + 80x_2 + 72 + 6\lambda = 0 \quad (F)$$

$$\frac{\delta Z}{\delta x_2} = -328x_2 + 80x_1 + 100 + 3.5\lambda = 0 \quad (G)$$

$$\frac{\delta Z}{\delta \lambda} = 6x_1 + 3.5x_2 - 3 = 0 \quad (H)$$

Now, (F) $\times$ (3.5) we get

$$-735x_1 + 280x_2 + 252 + 21\lambda = 0$$

(G) $\times$ (6) we get

$$-1968x_2 + 480x_1 + 600 + 21\lambda = 0$$

$$\text{Subtracting the above equations} \quad -1215x_1 + 2248x_2 - 348 = 0$$

$$\text{Or} \quad 1215x_1 - 2248x_2 + 348 = 0$$

$$(H) \times 202.5 \quad 1215x_1 + 708.75x_2 - 607.5 = 0$$

$$\text{Subtracting the above equations} \quad -2956.75x_2 + 955.5 = 0$$

$$\text{Or } x_2 = 0.3231.$$

Now putting the value of x_2 in equation (H)

$$6x_1 + 3.5(0.3231) - 3 = 0$$

$$6x_1 + 1.13085 - 3 = 0$$

$$x_1 = \frac{1.86915}{6} = 0.3115.$$

$$x_3 = 1 - 0.3231 - 0.3115 = 0.3654.$$

Therefore allocation of fund should be as follows:

Hind Cements = 31.15%

Shanta Biotech = 32.31%

Beta Chemicals = 36.54%.

$R_p = 21 (0.3115) + 18.5 (0.3231) + 15 (0.3654) = 18\%$.

6. Index funds are very popular all over the world. They are known for mobilizing huge money from the investors. However, in India, Index funds are not very popular because of two reasons. The first reason is lack of awareness among the investors about the Index funds and second reason is inadequate investor education by the mutual funds about their index fund schemes. Apart from these reasons, market volatility and recent scams have also shaken the investor's confidence. One of the important reasons for less popularity of index fund in India is nature of the capital market which is not efficient. Developed markets by and large are efficient and therefore do not provide a very easy chance to obtain any arbitrage gain from the market. But in India, as market is not efficient, abnormal market return can be obtained and therefore the index funds, which promises only market return are unattractive. Absence of ample number of benchmarks for different types of assets is also detrimental to the growth of the index funds. The entire Indian mutual fund industry and prominent asset management companies should try to educate the investors in understanding the advantages and disadvantages of the various types of mutual fund. If Indian investors are properly educated about the benefit of index funds and also the attached risk of the index fund, in years to come index funds will flourish.

Part E: Caselets

Caselet 1

7. Systematic Withdrawal Plan (SWP) is best suited for people who look for regular fixed income from their investments. SWP have caught the fancy of mutual fund industry because of tax benefit attached to it. The 2002-03 budget imposed a tax on dividend received by mutual fund investors. If an investor is falling under 30% tax bracket and receives dividend income, he has to pay a very high tax on his dividend income. Through SWP, these investor can greatly reduce their tax burden. If an investor starts withdrawing money after one year he will be paying long term capital gain tax at rate of 10% or 20%. If an investor wants to withdraw money before one year, short term capital gains tax linked to investor's tax slab is levied.
8. Automatic encashment plan is a type of SWP. This facility provides an opportunity of withdrawing the money from the capital appreciation of the net asset value of the fund. It does not provide any withdrawing facility in case of very low or zero capital appreciation in the underlying net asset value of the mutual fund. Since capital appreciation of any fund will not be constant, AEP cannot offer a fixed amount at regular interval because withdrawal of money is directly related to the proportion of capital appreciation of the fund. Although SWP offers a fixed sum at regular interval, it could provide the required sum by withdrawing the money from the principal if the capital appreciation is not sufficient to support regular withdrawing. Automatic Encashment (AEP) plans scores over the SWP in this matter by not touching the capital of any investor.
9. Systematic investment plans are just opposite to the Systematic Withdrawal Plan. In SIP, investor invest at regular intervals in a particular stock or fund. Systematic investment plan gives its investor an overall less average cost of his investment. This kind of plan is very beneficial in situation of rising market scenario. Systematic investment plan do not offer any tax benefit like SWP and requires a regular investment for a fixed period of time. SWP are not very popular because most of the investors are not aware of the advantages attached with it in the form of tax benefits and regular withdrawing facilities. The entire exercise of SWPs is also not very smooth and demands a constant watch. More importantly, retired people who require regular income always prefer other alternatives like post office monthly income plans. This is because they generally do not fall under tax brackets and therefore do not find SWPs very attractive.

Caselet 2

10. Comparison of a portfolio with a suitable, standard and matching portfolio gives an idea whether the portfolio's performance is superior or inferior. It makes a common sense to evaluate performance on a relative basis and thus requires the search for useful comparison portfolios. These comparative portfolios are referred as benchmark.

A benchmark helps in evaluating the performance of a portfolio or a fund. It also indicates the under and over performance shown by a particular portfolio. It acts as a target for the fund manager and also helps investors in understanding the performance his or her portfolio. Presence of a suitable benchmark also helps the fund manager while dealing with his clients. For example, a fund manager can easily explain the bad performance of a fund by saying that even benchmark has suffered loss.

An ideal benchmark should measure investment performance and reflect the characteristics and asset allocation strategies of a fund manager. In this sense the best way is to custom build a benchmark based on the fund managers investment process. But practically this is not feasible. As a compromise we look for an existing benchmark which reflects, as closely as possible, the investment objectives and constraints of the fund manager. Such standard benchmarks are widely available in the developed markets to take care of a wide range of performance measurement requirements.

11. A MIP should necessarily invest 85% of its fund in fixed income securities and 15% in stocks. The Crisil composite bond index represents movements of various kinds of bonds while, NIFTY indicates the movements of the stock market. Apart from this prime reason, the resulting index is a derived index and its composition also serves other purposes. For example, it will also serve as benchmark for non-diversified market participants to compare their performance against diversified fund consisting a mixture of financial instruments of non-equity segments. This composition of the index ensures a meaningful indication about the volatility of MIPs, and their correlation with other funds.

12. The article emphasized on using turnover as weighting factor due to various reasons. When turnover is used as weighting factor the resulting index will have a better indicating power about the fluctuations in the market. The index will be more transparent and will reflect the popularity of the securities. Infact important markets across the world have adopted free-float based indices. Using turnover as a weighting, buyer also gets an idea about the liquidity available in a particular security.

Apart from these advantages, it has now become a common practice across the globe to use turnover as weighting factor for indices.

Caselet 3

13. Disadvantages of investing in a floating rate income schemes. :

a. Absence of benchmark

We do not have benchmarks for all kinds of debt scheme in India. Benchmark for a floating rate debt scheme is a distant dream.

b. Limited choice for the fund manager

With limited primary issues for floating rate products, the fund manager may have to compromise on the quality of the bond he would be investing in. The average default risk of the portfolio would increase which would finally be borne by the investor.

c. Liquidity Trap

With markets for floating rate bonds limited in India, the secondary market trading for the existing floating rate bonds may suffer from inefficient price discovery. Besides, the investor (AMC) may slip in to liquidity trap in the event of any adverse situation/absence of interested parties.

d. Transaction cost

The fund manager of a floating rate scheme may initially invest in fixed rate bonds hoping to swap them against any good issue of floating rate bonds subsequently. Such swapping would add to the transaction cost for the portfolio.

Floating rate bonds are attractive in a rising interest-rate- environment. In these kind of bonds, interest is periodically recalculated based upon changes in the interest rates of the selected benchmark. If interest rates are high, floating rate bond will provide more coupon income and will be generally pegged at higher margin over the selected benchmark. Risk averse investors will not be willing to

invest in floating rate bonds because of uncertain yield attached to it. Typically, in declining interest rate scenario these bonds will generate lower return. The ideal situation for investing in these kind of bonds is if the current level of interest rates are low but expected to rise in future. Individual investors who can withstand some amount of risk and expects interest rate to rise in future are ideal buyers of floating rate bonds. These bonds may be attractive to some institutional investors who want to buy an asset which can provide an income stream that matches their floating liabilities. Investors, who view the floating rate bonds as a passive substitute for their short-term holding, particularly that part which remains at a certain minimum level, can also invest in these kind of bonds.

14. In floating rate bonds interest is adjustable and changes while interest rate remains almost fixed in the fixed rate bond. If there is dramatic change in rate of interest its impact on the floating rate bonds will be minimal. However, fixed rate bond will be very volatile. In fixed income bond, convertible clause always adds an attraction to the instrument but, in floating rate bond such innovations are not popular in India. Fixed income bond are generally issued by government or concerned bodies while floating rate bonds are generally issued by corporate entities.