

Impact of Stock volatility on Mutual Fund Investment: An Empirical analysis

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Abstract

Mutual fund is the trend of investment option in current scenario to invest in securities and bonds. The Indian mutual fund industry has witnessed major transformation and structural changes during the past two decades. Any investment options involve business risk, financial risk and liquidity risk. Risk cannot be eliminated but it can be diversified with Portfolio management of investment at certain level. Though the past performance alone cannot be indicative of future performance, there is only quantitative way to judge how good a fund is. Choosing from the various mutual funds selection with a systematic checklist to achieve the investment objectives is of utmost importance. A proper evaluation measure will remove confusion and help the investors to decide about the level of investment in various mutual funds schemes so as to avoid losses and maximize returns. The present study, the performance of various mutual schemes has been measured in terms of risk and return trade off. And to know the measures to minimize the effect of volatility on their investment which would help them to minimize the risk and earn good profits and use the volatility for their benefit.

Keywords: volatility, portfolio management

Importance

The importance of the research is that it is beneficial for the individual who are into share trading to know the effects of volatility of the share market on their investment. Also, to know the measures to minimize the effect of volatility on their investment which would help them to minimize the risk and earn good

profits and use the volatility for their benefit.

A stock is a share in the ownership of a company. Stock represents a claim on the company's assets and earnings. The more stock you are holding, the greater is your ownership stake in the company. Being a shareholder however does not mean you have any input in the day-to-day running of the business. Broadly stock can be classified into Blue Chip Stocks, Penny Stocks, Income Stocks, Value Stocks

,Defensive stocks Cyclical stocks ,Gold stock, Treasury stock some STOCK VARIANTS are common Stock , Preferred Stock , IPO , Mutual Funds, Options and Futures.

Role of SEBI

The Securities and Exchange Board of India (SEBI) was constituted on 12 April 1988 as a non-statutory body through an Administrative Resolution of the Government for dealing with all matters relating to development and regulation of the securities market and investor protection and to advise the government on all these matters. SEBI was given statutory status and powers through an Ordinance promulgated on January 30 1992. SEBI was established as a statutory body on 21 February 1992. The Ordinance was replaced by an Act of Parliament on 4 April 1992. The preamble of the SEBI Act, 1992 enshrines the objectives of SEBI – to protect the interest of investors in securities market and to promote the development of and to regulate the securities market. The statutory powers and functions of SEBI were strengthened through the promulgation of the Securities Laws (Amendment) Ordinance on 25 January 1995,

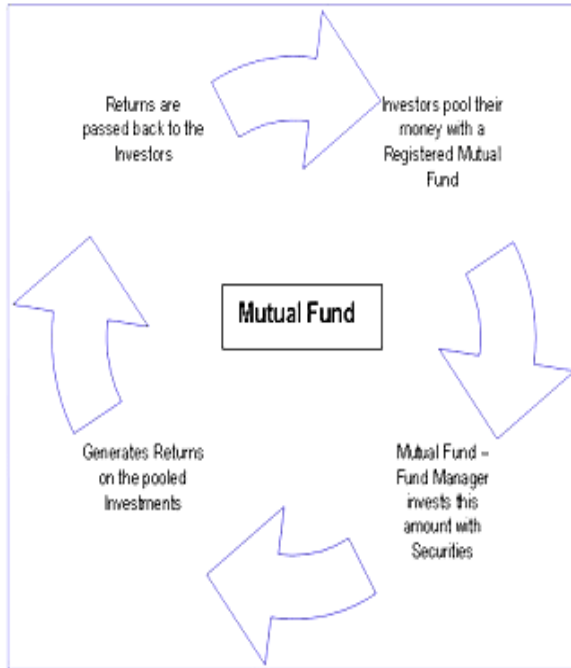
How Mutual Fund operates

The following chart gives us operational flow of a Mutual Fund

which was subsequently replaced by an Act of Parliament. Around 23 stock exchanges presently trading in India

1.1.INTRODUCTION

A Mutual Fund is a trust registered with the Securities and Exchange Board of India (SEBI), which pools up the money from individual / corporate investors and invests the same on behalf of the investors /unit holders, in equity shares, Government securities, Bonds, Call money markets etc., and distributes the profits. The income earned through these investments and the capital appreciation realized is shared by its unit holders in proportion to the number of units owned by them. This pooled income is professionally managed on behalf of the unit-holders, and each investor holds a proportion of the portfolio i.e. entitled not only to profits when the securities are sold, but also subject to any losses in value as well.



1.2 TYPES OF MUTUAL FUNDS

Based on Structure

- Open Ended ,Closed Ended ,Load & No Load Fund,
- Tax Exempt & Non Tax Exempt Fund:

Based on Investment Objective

Equity Fund - Simple equity , Primary market , Sectoral funds , Index funds Other equity funds , top 200 fund, 30-stock fund

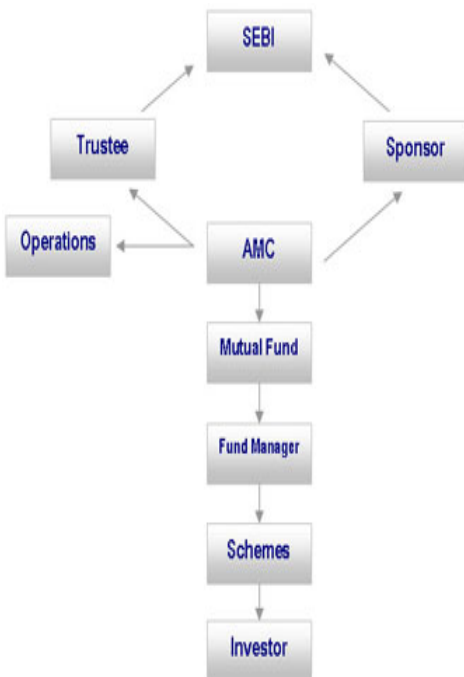
Debt Fund:

Liquid Fund:

- **Gilt Fund:**
- **Balanced Fund:**

Entities Involved in Mutual Fund

The following diagram illustrates various entities involved in the organizational structure of Mutual Fund



2.VOLATILITY IN SHARE MARKET

2.1INTRODUCTION

In general terms, volatility may be described as a phenomenon, which characterizes changeableness of a variable under consideration. Volatility is associated with unpredictability and uncertainty. In literature on

stock market, the term is synonymous with risk, and hence high volatility is thought of as a symptom of market disruption whereby securities are not being priced fairly and the capital market not functioning as well as it should be. As a concept volatility is simple and intuitive. It measures the variability or dispersion about a central tendency. However, there are some subtleties that make volatility challenging to analyze and implement. Since volatility is a standard measure of financial vulnerability, it plays a key role in assessing the risk/return tradeoffs. Policy makers rely on market estimates of volatility as a barometer of the vulnerability of the financial markets. The existence of excessive volatility or “noise” Also undermines the usefulness of stock prices as a “signal” about the true intrinsic value of a firm, a concept that is core to the paradigm of international efficiency of the markets.

Volatility estimation is important for several reasons and for different people in the market. Pricing of securities is supposed to be dependent on volatility of each asset. In this paper we not only extend the study period of the earlier paper but also expand coverage in terms of number of countries and statistical techniques. Mature markets / Developed markets continue to provide over long period of time high return with low volatility. Amongst emerging markets except India and China, all other countries exhibited low returns (sometimes negative returns with high volatility). India with long

history and China with short history, both provide as high a return as the US and the UK market could provide but the volatility in both countries is higher. The third and fourth order moments exhibit large asymmetry in some of the developed markets. Indian markets have started becoming informationally more efficient. Contrary to the popular perception in the recent past, volatility has not gone up. Intraday volatility is also very much under control and has come down compared to past years.

2.2 TRACKING ERROR

Definition – How variable the difference in total return is, between a portfolio and the index set as a benchmark. Tracking error is usually totaled over a period of time using a number of observations.

$$TE = SD (RX - RB)$$

$$RX = P$$

portfolio Return

$$RB = \text{Index Return (Benchmark)}$$

$$TE = \text{Tracking Error}$$

Strengths:

- Controlling tracking error can provide Trustees with comfort that performance will fall within an acceptable range around the index.
- Policy statements are often written in a way to limit tracking error e.g. Sector constraints.

- Used in most Risk Budgeting/Asset Liability models.
- There can often be comfort in looking similar to the rest of the industry.

Weaknesses:

- Doesn't recognize that pension plans need absolute performance to pay benefits.
- Encourages managers to follow 'Herd' mentality to stay close to index – can lead to "hire who's hot; fire who's not".
- Portfolios can lose money but still maintain minimum tracking error.

2.3 INFORMATION RATIO

Definition – Measures how much value is being added through active management per unit of relative (to benchmark) risk. Ideal to achieve value added with minimum volatility. Generally use a benchmark (e.g. S&P CNX Nifty) for relative volatility comparison.

$$IR(x) = \frac{RX - RB}{\text{Tracking Error}}$$

x = Portfolio

RX = Portfolio Return

RB = Benchmark Return (e.g. S&P CNX Nifty)

Strengths:

- Easily Measurable.

- Relates relative benchmark risk to added value.
- Can substitute style index (Value or Growth etc.) to better measure a manager's ability to add value.

Weaknesses:

- Does not relate to Plan Liabilities.
- Can lead managers overly focused on indices which can be very volatile.
- Does not measure risk of losing money.
- Measurement period is critical – Valuation date

2.4 SHARPE RATIO

Definition – Measures how much value is being added through active management per unit of absolute risk. Risk is investing in a portfolio which underperforms T-Bill returns.

$$S(x) = \frac{RX - RF}{SD(RX - RF)}$$

x = Portfolio

RX = Portfolio return

RF = Risk Free rate of return: (normally T-Bill return)

SD = Standard Deviation of RX-RB

Strengths

- Focuses attention on achieving absolute return.
- Makes sense to plan members who often see short-term investments as an option to the Pension Plan.
- Helps keep managers focused on making money for clients even in poor markets.

Weaknesses

- Can be impractical for managers to beat T-Bill returns over short periods of market weakness.
- Doesn't work well in asset/liability modeling.
- Many policy statements require portfolios to share similar construction to the index.
- In periods of market strength, no one cares about outperforming T-Bills.

REVIEW OF LITERATURE

Piyush Kumar Chowan in his article "**Volatility in Stock Markets cover**" a study of Volatility in Indian stock markets to understand the reasons for turbulence in the last two years.

M. T. Raju, Anirban Ghosh in this article "**Stock Market Volatility - An international Comparison**" a study on Existing studies of volatility across markets, (*Bekaert and Harvey 1995*),

have shown that the characteristics of emerging market equities are vastly different from those for developed markets' equities.

David Ayriss & Neil Watson, CFA in his article "**How do you determine risk in the pension plan**" under this article he has covered the various formulas to calculate volatility

The book, "**Mutual Fund Industry in India – An Introduction**" edited by **Amit Singh Sisodiya** attempts to offer incisive insight into the Indian mutual fund industry.

"**Volatility Impact on Market Returns**" article written by **Hans Wagner** under this he has covered the impact on market return due to volatility.

"**An Inside Look At Internal Rate Of Return**" by **Linda Grayson** shows The internal rate of return (IRR) is frequently used by corporations to compare and decide between capital projects, but it can also help you evaluate items in your own life, like lotteries and investments.

RESEARCH METHODOLOGY

Data Collection is mainly divided into two categories, i.e. Primary Data and Secondary Data.

Primary Data: From the overall population of Nanded city 350 investor

have been survey and data collection about the investment option is collected. The method to be used in the thesis for Primary data collection is Questionnaire method. The present study is 3 schemes of highly diversified schemes on the basis of calculation of ratios and various statistical measures for volatility of short term and long term i.e. oct 2007 to sep 2008 and oct 2005- sep 2002 respectively.

Objective

- To gain knowledge about share market and mutual fund.
- To know the various methods for calculating Volatility in share market.
- To study the effects of volatility of share market on mutual fund investment of people.

The Scope for this study is it is beneficial for the investors who don't do any fundamental analysis of the company before investing in it. Such people can calculate the volatility of certain stocks and decide to invest in less volatile stocks.

Limitations

The limitations in finding the effects of volatility on the investment of people

might be inappropriate disclosure of people's investment, the factors taken into consideration for calculating the volatility and also external factors like inflation, impact of international market, etc.

EMPIRICAL ANALYSIS

Performance: *HDFC Top 200 Fund Fact Sheet, September 2008*

Period	Annual Returns (%)	
	Fund	Benchmark
Since Inception	25.00%	14.31%
Last 10 years	26.74%	17.10%
Last 5 years	31.47%	22.06%
Last 3 years	19.31%	12.30%
Last 1 year	-15.36%	-26.39%

Source: HDFC Top 200 Fund Fact Sheet, September 2008

Performance:

Period	Annual Returns (%)	
	Fund	Benchmark
Since Inception	50.12%	25.92%
Last 3 years	44.53%	25.38%
Last 1 year	19.31%	0.09%

Last 6 months	-18.04%	-22.39%
<i>Source: Reliance Diversified Power Fund Fact Sheet, September 2008</i>		

Performance:

Period	Annual Returns (%)	
	Fund	Benchmark
Since Inception	35.5%	25.6%
Last 5 years	30.5%	22.5%
Last 3 years	21.6%	14.6%
Last 2 Years	10.8%	4.5%
Last 1 Year	-18.6%	-21.9%
<i>Source: Sundaram BNP Paribus Select Focus Fund Fact Sheet, September 2008</i>		

There are certain steps to solve the problem.

Step 1: Formulation of the hypothesis.

The hypothesis testing starts with the formulation of the hypothesis. Therefore H0 and H1 are:

H0: *There is no significant effect of share market volatility on mutual fund investment.*

H1: *There is significant effect of share market volatility on mutual fund investment.*

Step 2: Selection of the statistical test to be used.

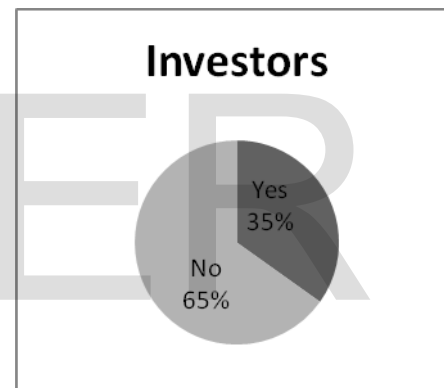
Here size of the sample is large (i.e. n=350) and population standard deviation is assumed. Therefore we can use Z-test to solve the problem.

Step 3: Selection of the significance level.

The level of significance is $\alpha=5\%$.

Step 4: Calculation of Standard Error of the sample statistic and standardize the sample statistic.

People who prefer to invest in Volatile market	122
People who do not prefer to invest in Volatile market	228
Total	350



Here, $X = 228$, $\mu = 350$ and $SE = 10$

$$Z = \frac{X - \mu}{SE}$$

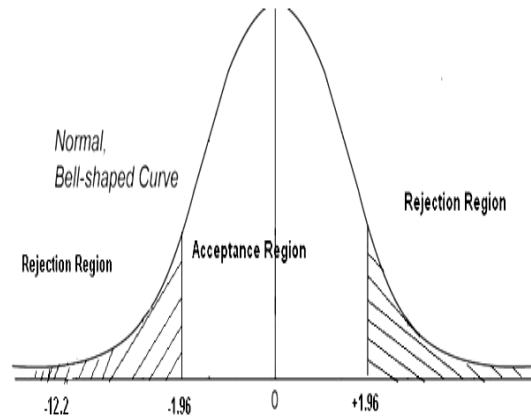
$$Z = \frac{228 - 350}{10}$$

$$Z = -12.2$$

Step 5: Determine the critical values.

Since the test is two-tail test and the level of significance specified is 5%. Therefore the critical values are -1.96 and +1.96.

Step 6: Comparison of value of the sample statistic with the critical value and identify whether the value falls within the accepted region or rejection region.



Since the calculated Z value lies in the rejection region. Therefore we reject H_0 and accept H_1 .

Thus, there is significant effect of share market volatility on mutual fund investment.

FINDINGS AND OBSERVATIONS.

Method	Tracking Error		Information Ratio		Sharpe Ratio	
	Short Term	Long term	Short term	Long term	Short term	Long term
<i>HDFC Top 200 Fund</i>	0.8162	0.5187	0.135	0.135	0.135	0.135
<i>Reliance Diversified Power Fund</i>	0.7877	0.7832	0.244	0.244	0.244	0.244
<i>Sundaram BNP Paribus Select Focus Fund</i>	0.2785	0.5908	0.118	0.118	0.118	0.118

- The Sharpe Ratio tends to be high for Fixed Deposit, Liquid Funds, and Debt Funds while low for Equity Funds. This

means the fund having lowest Sharpe Ratio is most risky and most affected by Volatile Market.

- Amongst the mutual funds taken for study, Sundaram BNP Paribus Select Focus Fund has the lowest Sharpe Ratio both for Short term and Long term (i.e. 0.135). It means that this fund's returns are tremendously affected due to the Volatile market.
- Tracking Error is high for more diversified portfolio and it is low for the funds like Index Funds which are following only a particular Index. It is better to choose a fund having low Tracking Error.
- From above table we can see that, the Tracking Error for Short term is highest of HDFC Top 200 Fund (i.e. 0.8162 which means annual change in the fund's value would approximately be $(0.8162 \times 16) \pm 13\%$).
- The Tracking Error for Long term is highest of Reliance Diversified Power Fund (i.e. 0.7832 which means annual change in the fund's value would approximately be $(0.7832 \times 16) \pm 12.53\%$).
- The higher the Information Ratio the better it is for any Mutual Fund. It means the value by which the fund outperforms its Index (Benchmark).
- From above table we can see that, the Information Ratio for Short term and

Long term is highest of Reliance Diversified Power Fund (i.e. 0.244). This shows that the fund which has highly outperformed its Index (Benchmark) is Reliance Diversified Power Fund.

CONCLUSION

The effect of volatility of share market on mutual fund investment and concluded that we should select a fund having low Tracking Error, high Information Ratio and high Sharpe Ratio, because it minimizes the effect of Volatility on our investment. Information ratio and Sharpe ratio are same for both Short term and Long term

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