

Mutual Fund Rating in India

Issues and Methodology

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This article attempts to study the issues that complicate mutual fund schemes' rating, with a specific focus on the Indian capital market. The main aim of the article is to identify the factors and to outline a methodology of rating.

Of late, the significant expansion of the mutual fund industry in India, both in terms of the number of funds and schemes and participation of various financial institutions as intermediaries is one of the noticeable trends in the financial sector. This, coupled with the surging capital markets and promised returns by the providers of these funds has made it very difficult for the retail investor to choose the fund that would cater to his specific requirements. In such a scenario, a credible and near accurate mutual fund rating becomes all the more crucial.

In India, rating of fixed income securities such as bonds and money market instruments is in practice, though limited to only a few credit rating agencies. The notable among them are the Credit Rating Information and Services of India Limited (CRISIL) and India Credit Rating Agencies Limited (ICRA). When it comes to mutual funds, the CRISIL Composite Performance Ranking-tracking (CPR) is relative performance ranking of the mutual funds schemes within investment category for the peer group. The basic eligibility criteria for the inclusion in the peer group are, a two-year Net Asset Value (NAV) history and 100% portfolio disclosure as on the date of ranking. The performance of the schemes is measured on the basis of the following criteria, which may vary across the investment type.

- Super return score.
- Portfolio concentration.
- Liquidity.
- Asset quality (debt schemes).
- Average maturity and mark to market composition in portfolio in liquid schemes.
- Asset size.

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Methodology

This article adopts the methodology of Value at Risk (VaR). The methodology chosen to implement VaR is based on JP Morgan's credit matrices methodology. The advantage of VaR is its universal acceptance that can be extended to debt, equity or any assets. VaR can be added onto the market risk to get the overall risk of the portfolio. At the same time, this approach requires historical data on the migration of assets between credit quality brackets as well as correlation between the returns on assets. Further, this approach incorporates correlation between the assets to arrive at the final estimation of the VaR. Correlation can be taken as a reasonable good proxy for the measurement of the diversification of funds.

Mutual Fund Rating in India – The Present Scenario

At present, mutual fund ratings are restricted to debt funds. The rating methodology is further restricted to mere Credits Quality Assessment (CQA). CQA is a purely quantitative exercise in which historical default and transaction rates are combined with the weightage of the portfolio in each category to arrive at a number score. The final rating is mapped on this score. No effort is made to include the effect of correlation; hence the benefits of diversification of portfolio are entirely ignored. The benefits of diversification, especially as far as mitigation of the risk is concerned, are well-known. Thus, it is obvious that a fund entirely comprising AA-rated bonds should actually have an overall rating of AAA because of diversification achieved in the portfolio. This diversification could be along various dimensions, namely:

- The number of companies.
- Across industry/sectors.
- Value of the investors.

Presently, the mutual fund market in India is in an evolutionary stage. The majority of the funds is new and even the debt funds typically invest only in AAA-rated bonds and government securities. In such a scenario, a study of the benefits of diversification will not lead to any tangible benefits to the fund manager. However, with the market maturing over a period of time, more funds will start looking at the bonds with lower ratings. In such a situation, a proper study of the kind of the diversification will help the fund manager in two major ways:

- If greater diversification leads to better ratings, it will enable the fund manager to get higher ratings for the fund and any fund manager will desire the higher safety perception, along with higher ratings.
- Intrinsically, it will enable him to manage the fund better. For instance, if a fund consisting entirely of BBB bonds can have an AA rating through diversification; it implies that in all likelihood the yields are going to be similar to those expected from BBB Bonds, but with a safety level corresponding to AA bonds.

This article presents focused efforts on trying to incorporate the effects of diversification on the rating methodology to be developed in future. The primary hurdle stems from the lack of relevant data assumption pertaining to the data. However, it is expected that these gaps will be filled in the course of time and with the subsequent development of the market.

Returns and Risk Analysis

Superior Return Score

The Superior Return Score (SRS) gives the relative measure of the return and the risk for the schemes within the peer group. For computation of SRS, daily return of the scheme within the peer group is calculated for all the days covered for analysis. The daily average of this return is the peer average return and the daily returns of the schemes are calculated. This is the differential return series for the scheme. The average and the standard deviation of the differential returns series give the measure of the return and the risk respectively. The average return divided by the standard deviation of the differential return is the SRS.

For equity, balance and gilt schemes, the SRS is computed for two years on the daily NAV and for the Liquid schemes, the SRS is computed for a period of one year. The debt scheme portfolios have been marked to market on a weekly basis in the past. Therefore, the SRS for the debt scheme is done on the basis of weekly NAV. When the schemes have completed their two-year mark the rating agencies will shift to the tri-weekly returns from the weekly returns as of now.

The two-year period of the analysis is broken down into four six-monthly periods. After computation of SRS in the manner described above, the total SRS is calculated using the following weightages:

Latest period: 32.5%.

Third period: 27.5%.

Second period: 22.5%.

First period: 17.5%.

Thus, the latest performance gets a higher weightage. In case of liquid funds where the analysis is for one year period, the latest six months carry a 60% weight and previous period, 40%. The top performer gets a score of 1 and the others get a performance score in relation to the category top performer. A dividend payoff, if any, is assumed to be reinvested on the ex-dividend date at the NAVs for the calculation of the weekly returns.

Portfolio Concentration Analysis

Academic studies have clearly demonstrated that mutual funds in general are unable to outperform the benchmark indices after accounting for the transaction expenses. On the other side, one can assume that the fund manager is likely to start from neutral passive strategy and move towards active management style depending on the risk appetite.

This study makes use of S&P CNX Nifty of NSE as benchmark in measuring that part of concentration risk that arises from deviating from the benchmark and investing in non-index stocks (for assuming non-neutral position). Concentration is included as a separate criterion for the computation of the Composite Performance Ranking (CPR). This is because; the Indian mutual funds industry is yet to attain depth, maturity and have an empirical evidence of displaying market cycles. In such circumstances, the volatility of a portfolio using one year of historical NAV data may not yet reflect the

concentration risk in the portfolio. The industry and company concentration scores of the scheme are measured separately. This parameter will be applied in all categories except Gilt Funds.

Industry Concentration

The industry concentration measures the exposure of mutual fund schemes (in equity and balance category) in various industries, over and above the industry distribution pattern in the S&P CNX Nifty Equity Index, developed jointly by CRISIL and Standard & Poor's, US. For industry concentration measurement of equity funds, the companies have been classified as per the Association of Mutual Funds of India (AMFI) Economic Sector classification. In case of equity funds, Nifty will be used as a bench mark. Deviation will be computed for both over and underexposure. For Debt Funds, the entire portfolio will be classified into 4 broad categories and limits are specified as follows:

· Gilt	50%
· Manufacturing	40%
· NBFC	10%
· Non-Manufacturing and non-NBFC	25%

Company Concentration

For deciding the overexposure on Nifty stocks, limits of individual Nifty stocks or 1% whichever is higher, is considered. For non-Nifty stocks, 1% is considered in determining overexposure limit. One should not penalize unduly as it involves stock discovery, which is a part of fund management skills. For Nifty stocks, funds will be penalized for both over and underexposure. For non-Nifty stocks only overexposure will have a penalizing effect. In case of debt portfolio in balance, debt and liquid funds' categories, securities belonging to companies in the manufacturing sector will have exposure limit of 9%, NBFCs will have a limit of 6.5%. These limits have been fixed based on the industry feedback. It has been done to capture the extra risk taken by investing more in a single company's debt paper.

Cash and Call

The other key parameter of activity-managed mutual fund behavior that hurts a unitsholder is the cash reserve of mutual funds as it involves an opportunity cost. In the Indian context, the fund houses will be penalized, for exposure limit above 15% in the case of equity and balance funds. In case of debt, this is fixed at 10%. Gilt and liquid funds have been exempted from this criterion. The cap on cash and call has been put so that funds should stay fully invested normally in financial instruments.

Liquidity Analysis

Liquidity of investment in a scheme's portfolio is measured by computing the internal risk of each security in the portfolio, i.e., it measures the ease with which the portfolio can be liquidated.

Internal Liquidity Risk

Internal liquidity risk addresses the issues of impact effect in illiquid stocks or the problems associated with non-synchronized trading arising out of infrequent trading. It is computed by comparing the investment in each security as against the market turnover for that security. Additionally, the number of days for which the security was traded will also be considered. All the computations will be done for a period of six months.

Equity and Balance Funds

The liquidity is computed by comparing the total holding of a particular stock with the its turnover in the market.

Gilt Funds-liquidity

Liquidity in the case of gilt funds will be based on three parameters with the following final weightages:

Turnover – 7.5%.

No. of days traded 5.0%.

No. of trades 2.5%.

Corporate Debt Liquidity

All the companies whose papers are held by mutual funds are broadly classified as liquid, semi-liquid and illiquid.

After penalty coefficients are assigned for these three classes:

1. Liquid – x
2. Semi-liquid –y
3. Illiquid – z

$$\text{Penalty} = \% \text{ NAV} * \text{Penalty Coefficient}$$

The total penalty of the corporate debt component of a fund is calculated by summing up the penalties of the individual papers/companies.

Total Liquidity

Total Liquidity is computed by the gilt and corporate liquidity score using the gilt corporate debt adjustment factor. Gilt corporate debt adjustment factors take care of difference in liquidity between corporate debt and gilt markets.

Asset Quality

Debt and Balanced Funds

In the case of debt portfolios, asset quality is a factor of default/migration statistics arising out of credit risk history maintained by CRISIL, to various securities. So here asset quality of a scheme based on the asset mix will be calculated as under:

Where, X% stands for the default/migration statistics being provided by CRISIL historical behavior data on various classes of debt papers.

For Non-CRISIL-rated and unrated papers, the view provided by CRISIL's ratings division is taken. Total asset quality is obtained by summing up all the category scores. The scores for the individual funds then will be obtained as explained in the case of SRS.

Asset Size

Asset size refers to the net investment funds of the mutual funds schemes. The criterion is chosen as the complexity of fund management increases with increase in

Category (a)	% Portfolio (b)	Default Rates (c)	Weighted Score (d) (b*c)
G Secs		X%	
AAA		X%	
AA+		X%	
AA		X%	
AA-		X%	
A+		X%	
A		X%	
A-		X%	
BBB+		X%	
BBB		X%	
BBB-		X%	
BB & below		X%	
P1+		X%	
P1		X%	
P2+		X%	
P2		X%	
P3+		X%	
P3		X%	
Total Quality of asset			

Source: Author's Representation

assets managed. The big funds may face deployment problem which will impact return and risk. At the same time, small funds are not having economies of scale in generating optimum returns. Also, the size of the assets becomes difficult to manage if it increases beyond a limit, in a shallow market characterized by lack of depth and illiquidity. However, there exists a risk premium through returns generated in case of complexities if such conflicts on asset sizes are resolved. Hence, in each category schemes are simply ranked based on their asset sizes. So the bigger the asset size, the better the rank.

Category	% Weightage				
	Equity	Debt	Balanced	Liquid	Gilt
Superior return score	75%	60%	75%	60%	75%
Concentration - industry	5%	5%	5%	-	-
Concentration - company	5%	5%	5%	10%	-
Equity liquidity	10%	-	10%*K	-	-
Debt - asset quality		15%	5%*(100 - K)	-	-
Debt liquidity		10%	5%*(100 - K)	-	-
Gilt liquidity				-	15%
Average maturity				10%	-
Mark to market component				10%	-
Asset Size	5%	5%	5%	10%	10%

Source: Author's Representation

Table 3: Composite Performance Ranking Methodology

CPR Category	Interpretation
CRISIL - CPR 1	Very Good performance in the category (Top 10% of the universe)
CRISIL - CPR 2	Good performance in the category (Next 20%)
CRISIL - CPR 3	Average performance in the category (Next 40%)
CRISIL - CPR 4	Below average performance in the category (Next 20%)
CRISIL - CPR 5	Poorest performance in the category (Last 10%)

Source: Author's Representation

Credit Risk Assessment Theory

Credit Metrics

Credit Metrics is a methodology to quantify credit risk across instruments. It seeks to construct what it cannot directly observe; the volume of the trade value is due to credit changes. Their main features are:

- It is designed to provide measure of portfolio risk that takes into account the relationship among the assets and the portfolio interactions.
- Provide a consolidated statement of credit risk across a whole portfolio measure credit risk of wide range of the instrument including bonds, loans, letters of credit, commitments, derivatives and receivables.
- Measure Value at Risk (VaR) due to credit events, including updates, downgrades and default across an entire portfolio and for marginal transactions.
- Quantifies concentration risk by incorporating correlation.

Credit Metric adopts a mark to market framework. Value at risk is the risk measure used in credit metric. The main difference between market risk VaR and credit risk VaR is that the former is normally distributed, while in case of credit risk, value changes are very small or minor up (down) grades. This results in a skewed return distribution with heavy downside tails.

Table 4: Difference between Credit Metrics and Risk Metrics

Parameter	Credit Metrics	Risk Metrics
Market Value Distribution	Skewed	Normally distributed
Relevant time horizon	Longer	Short
Summery statistics	Mean, Std. Dev, skewness, kurtosis	Mean Std. Dev
Computation procedure	Simulation	Closed form analytical equation
What is determined?	VaR across distribution of historically estimated credit outcomes	VaR across distribution of historically determined realization
Modeling approach	Model the mechanism of change in value	Observe and model the actual observed values

Source: Author's Representation

Importance of Credit Quality Assessment

A booming global economy till the year 2000 and a healthy credit cycle created a business environment in which increasing number of Institutions are taking on more complex forms of credit risk. Credit risk arises because the bond value in one year can vary depending on the credit quality of the issuer. Generally, value changes are relatively small when compared to the grades change. However, they become significant (nearly 50% to 90%) in case of default. Traditionally, credit risk management has encompassed stringent undertaking standards, limit enforcement and counter-party monitoring. Also, more financial institutions are taking an increased exposure to credit risk and credit exposures are multiplied. Therefore a need for quantifying credit risk and integration with the market VaR would provide a proper benchmark to managers. The main reasons that have lead to the increased importance of credit rating are:

- As credit spreads continue to narrow, banks in competitive lending market are subjected to more credit risks. US primary loan syndication activity reached \$900 bn in 1996, yet secondary loan trading volume was only \$40 bn. In India, such statistics are even more skewed.
- The proliferation of complex financial instruments has created uncertain and market sensitive counter party exposure that are significantly more challenging to manage than traditional instrument such as bonds.
- As investors find fewer opportunities in interest and currency markets, they are moving towards yield enhancement through extending and trading credit.
- An increasingly varied array of instruments are intermediating and extending credit.

Credit metrics methodology assesses individual and portfolio VaR due to credit risk in 3 stages:

- i. Exposure profile
- ii. Volatility of Value
- iii. Correlation between upgrades downgrades and defaults.

Estimating Credit Limit Exposure Amount

The credit exposure is the amount subject to change in value due to up (down) grade or loss in case of default. The exposure could be in the form of fixed commitments like loans/bonds or in the form of market driven instruments like swaps or forwards. The existing ratings of the securities are used to indicate their quality.

Calculating the Volatility of Value Due to Credit Quality Changes

This is accomplished in three steps:

Estimating Credit Risk Quality Migrations

This involves the creation of the transition matrix. It estimates the probability of migration to any possible credit quality state. This is calculated by observing the historical pattern of change and default.

Estimating the Change in Value upon Credit Quality Migration

Each instrument would have to be revalued at each different state of credit quality. Credit Metrics gives a weight to remote but possible credit quality migration according to the long-term historical frequency, without regard to how short-term sampling of bond price would or would not have affected them. There would be two different types of revaluation:

Due to Default

In this case, the recovery rate would depend on the seniority class debt. This is based on historical data. The reasons why default rates are volatile are:

- Defaults are random events.
- Volume of high yield bonds across the years is uneven.
- The business cycles are observed during times of economics recession.

Estimating Credit Quality Correlations

In case of a portfolio, rating outcome of different obligors is generally not independent of one another. This is because they are affected by the same economic factors. Therefore, an estimation of joint likelihood of outcome becomes necessary. If a portfolio of "N" securities, with eight factors of credit quality exists, then there would be correlation between the credit quality migrations. But this information is almost impossible to obtain due to scarcity of data that would involve a very high substantial assumptions. Therefore, alternative approaches have to suggested.

In case of a portfolio, rating outcome of different obligors is generally not independent of one another

- Bond spread correlations: It is the most objective measure. But it is plagued by poor quality data.
- Uniform constant correlation: It is not very precise and restricts analysis. But it is better to use this than taking into account the correlations at all.
- Equity price correlations: They provide efficient market information and are convenient to obtain. They however require heavy processing.

Credit Quality Migrations

According to the option theoretical approach proposed by Fisher Black and Myron Scholes and later developed by Robert Merton, market value evolves randomly through time as new information emerges. Default occurs when the value of the firm falls so low that the firm's assets are less worth than its liabilities. This is used as a basis for default risk estimation. The distribution of the asset value of the firm is mapped onto the default likelihood's in order to get the ranges of the firm's asset value within which the firm would have a particular rating. Therefore, the different asset levels correspond to different rating categories.▶