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**Survey of Credit Rating Methodologies of Mutual Funds:
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Abstract

Credit rating literature attracted attention of academics since the subprime crisis 2008. In the wake of the crisis hundred billion dollars' worth securities that were awarded AAA rating by the world's leading credit rating agencies downgraded to junk. So is the survey on credit rating methodology. This work intends to survey the methodologies Moody's and S&P follow in assessing the performance of equity funds and debt funds. The authors conclude that in these rating methodologies of S&P and Moody's the link between equity fund and debt fund, i.e. how downgrade of debt fund can lead to downgrade of equity fund is not captured. Secondly Moody's shakes off or manages the risk of loss of goodwill in the wake of failure of short term debt fund rating in the case of certain systemic factors like suspending or discouraging withdrawals and redemptions, by prescribing automatic downgrade to junk.

Keywords; net asset value, expense ratio, asset management, fund credit quality rating, assets under management, funds risk

JEL Classification: G23, G24

INTRODUCTION

A mutual fund is a professionally managed type of collective investment scheme that pools money from many investors and invests it in stocks, bonds, short-term money market instruments and other securities. Mutual funds have a fund manager who invests the money on behalf of the investors by buying or selling stocks, bonds etc. There are many reasons why investors prefer mutual funds. Firstly it is not as risky as share. Secondly it does not offer as low return as does fixed income instruments. Thirdly, it saves time and cost of information collection. There are so many investment avenues in the financial market in the current time, so it becomes very difficult for the investors to identify the best avenues that they can opt for their investment needs. Mutual Fund is one of the safe investment areas for a person who does not know where to invest her extra disposable income for higher returns than those offered by banks. So it can be said that the identification of the highest return and the specific mutual fund company that gives the best amount of return becomes necessary. Then there is the determination of which company provides greater returns in the specific scheme.

An asset management company (AMC) is a company that invests its clients' pooled funds into securities that match declared financial objectives. Asset management companies provide investors with more diversification and investing options than they would have by themselves. AMCs manage mutual funds, hedge funds and pension plans, and these companies earn income by charging service fees or commissions to their clients. AMCs offer their clients diversification because they have a larger pool of resources than the individual investor could access on her own capacity. Pooling assets together and paying out proportional returns allow investors to avoid minimum investment requirements often required when purchasing securities on their own, as well as the ability to invest in a larger set of securities with a smaller investment. The performances of investment portfolios in financial markets and assets held in the banks are important signals for credit rating of an AMC.

There is no private contract between a private individual investor and a credit rating agency (CRA) and the investor is free to accept or reject the opinion of the agency. Thus, a rating agency cannot be held responsible for any losses suffered by the investor taking investment decision on the basis of its rating. But there are contracts between CRAs and institutional investors, where a CRA may be held responsible.

BACKDROP

Credit rating literature attracted attention of academics since the subprime crisis 2008. In the wake of the crisis hundred billion dollars' worth securities that were awarded AAA rating leading CRAs downgraded to junk. So is the study on credit rating methodology.

OBJECTIVES

There are two fundamental securities, either or both of which underlie all mutual funds. Debt funds provide income and equity funds provide capital appreciation. A balanced fund provides both.

Against the above backdrop this work intends to survey the methodologies Moody's and S&P follow in assessing the performance of equity funds and debt funds. In a way this work is a survey by nature.

MUTUAL FUND RATING PRACTICES

The study is focused to the methodologies of fund credit rating. Moody's, S&P and Fitch Ratings control the major share of the credit ratings business. Fitch does not rate mutual funds. The rating methodologies followed by other two in mutual fund rating are to be examined in this paper. This is where the study comes into play where the analysis of the performance methods, on the basis of the assets accumulated by them, which helps the investors to identify the scale and size of the company's operations.

S&P owns CRISIL. It categorized the mutual funds into (A) Equity Funds (i) large cap funds, (ii) large and mid cap funds, (iii) multi cap funds, (iv) small cap funds, (v) value/contra funds, (vi) focused funds, (viii) thematic infrastructure funds, (ix) equity linked savings scheme, (x) index funds, (xi) aggressive hybrid, (xii) conservative hybrid, (xiii) gilt funds, (B) debt Funds (xiv) banking and PSU funds, (xv) credit risk funds, (xvi) corporate bond funds, (xvii) dynamic bond funds, (xviii) medium to long duration funds, (xix) medium duration funds, (xx) short duration funds, (xxi) money market funds, (xxii) low duration funds, (C) hybrid funds (xxiii) ultra short duration funds, (xxiv) liquid funds.

Following are the categories of CRISIL mutual fund ranking:

CRISIL Fund Rank 1	Very good performance
CRISIL Fund Rank 2	Good performance
CRISIL Fund Rank 3	Average performance
CRISIL Fund Rank 4	Below average performance
CRISIL Fund Rank 5	Relatively weak performance

Globally S&P categorized the mutual funds into (i) best diversified equity funds, (ii) best growth funds, (iii) best blend funds, (ix) best large cap funds, (x) best mid cap funds, (xi) best small-cap funds, (xii) best sector funds, (xiii) best international stock funds, (xiv) best US taxable bond funds, (xv) best international bond funds, (xvi) best municipal bond funds.

In the Standard and Poors' Methodology, the FCQR (fund's credit quality rating) scale ranges from 'AAAF' to 'Df': - 'AAAF' indicates the credit quality of the fund's portfolio exposure is extremely strong. - 'Df' indicates that the fund's portfolio is predominantly exposed to defaulted assets and/or counterparties.

DATA

Articles on equity rating and debt rating are collected from websites of S&P and Moody's.

MOODY'S EQUITY FUND RATING

Moody's rates equity funds based on rank order. It compares an equity fund launched by a particular fund manager with another similar fund within the same category launched by the same fund manager, but not across fund managers in and out of the country. In doing so it had used to calculate both Information Ratio and Sharpe Ratio to gauge the performances of equity ratio. Later Moody's realized that calculation of both the ratios are duplicative in nature, rather calculation of only the information ratio is enough. The information ratio measures the performance of the fund with respect to the benchmark index fund by dividing the excess of the fund's NAV (net asset value) return over the benchmark index fund return

by the tracking error, i.e. the standard deviation of the above excess return, whereas the Sharpe ratio measures fund performance with respect to the risk free security by dividing the excess of the fund's NAV return over the risk free return by the standard deviation of the said excess return. Moody's also likes to measure expense ratio and maximum drawdown measure. Expense ratio covers the fees for fund management including legal fees, auditing fees, salary of fund manager and staff and other operating expenses excluding commissions to brokers etc. There is a positive correlation between expense ratio and fund performance. Drawdown means withdrawal by investors. These are indicators of bad performance of the fund. Higher the drawdown lower is the performance indicator. The fund/investment/asset manager's quality and experience also matter. The expense ratio, information ratio and investment management are given scores and the total score is the basis of comparison (Moody's 2017). The weights are as follows:

Expense Ratio	–	25%
Fund Performance	–	25%

Sub-factors

Information Ratio	-	15%
Maximum Drawdown	-	10%
Asset Management	-	50%

Sub-factors

Client Servicing	-	7.5%
Financial Profile	-	17.5%
Investment Management Activities	-	25%

S&P's LONG TERM DEBT FUND RATING

S&P assigns fund credit quality ratings (FCQRs) to fixed-income funds. An FCQR assesses the credit risks of a fund's portfolio investments, the level of a fund's counterparty risk, and the risk of a fund's management ability and willingness to maintain current fund credit quality. An FCQR does not guarantee a funds ability to meet payment obligations and yields of the fund.

S&P calculates an FCQR following four steps. At first it assesses the weighted average credit risk of the portfolio of assets or instruments similar to assets including repo, market values of the receiving legs of credit default swaps, such as corporate bonds, interest rate swaps and currency swaps. There is multiplication of credit factors applied to (weighted by) the aggregated percentage of investments (whose exposure amounts are generally based on reported market value) held at each rating level and are further differentiated by remaining maturity.

For example if in a 2-paper portfolio, a long term paper is carrying 40% weight, S&P credit rating B+ has remaining maturity more than 365 days and a short term paper is carrying 60% weight, S&P credit rating C then the estimated portfolio credit risk is $40\% * 5800 + 60\% * 22000 = 2320 + 13200 = 15520$.

In the case of derivative contracts like interest rate swaps, S&P takes their mark to market value and includes them in the portfolio when their value is as high as more than half of portfolio. In the case of credit default swap, the long position belongs to the protection seller, where the cash inflow is akin to insurance premium and the buyer's position needs to be replica of a physical asset of the size of the protection. The short position is added to the portfolio credit score unless it consists of a major portion of the portfolio (S&P Global Market Intelligence, 2017).

MOODY'S' SHORT TERM MONEY MARKET FUND (MMF) RATING

The unique nature of money market funds is that, investors own shares in the fund representing an interest in a portfolio of securities, yet expect to be able to withdraw their funds on demand in meeting the dual objectives of preserving principal and providing liquidity to holders. Because assets with short-term maturities are normally more liquid given their short life cycle and, as such, they are also easier to liquidate in case of market stress, if a fund holds a high percentage of floating rate notes, Moody's may consider the Weighted Average Life (WAL) of the portfolio in addition to WAM in its Asset Profile assessment because WAL is a good indicator of a fund's sensitivity to changes in credit spreads and market liquidity conditions though Moody's considers weighted average maturity (WAM) as a key factor which drives a money market fund's sensitivity to changes in interest rates, it also indirectly reflects the fund's liquidity profile and its ability to meet redemption obligations in the short term.

Moody's express the ratings of long term securities using alpha numeric symbols and those of money market funds expressed attaching 'mf' after alphabetic symbols.

(a) Portfolio Credit Profile

When benchmarking a fund's portfolio credit quality, Moody's considers the quality of individual securities in the fund as well as the maturity of those investments, reflecting the view that shorter-dated instruments represent less absolute quantum of risk, all else being equal, than longer-dated instruments (i.e., the cumulative expected credit loss curve is upwardly sloping over time). Then Moody's accomplishes this analysis by using Moody's Credit Matrix, which is a tool that attributes to each security in the portfolio a specified amount of loss that is derived from: 1) its actual or estimated long-term rating; 2) the expected loss associated with that rating over a one-year timeframe using Moody's long-term idealized loss table; 3) an adjustment for the security's remaining maturity if it extends beyond one year; and 4) assumes the proceeds at maturity are reinvested in a security with a like long-term rating and maturity, over the course of a 12-month period. Finally Moody's aggregates the expected loss for each security, divides it by the total volume, and maps the resulting ratio to the corresponding 12-month alpha-numeric rating level in Moody's long-term idealized loss table. Asset-backed commercial paper (ABCP) or variable rate demand notes (VRDNs), generally assigned only short-term ratings, do not directly get place in Moody's Credit Matrix.

(b) Portfolio Stability Profile

Because money market funds are susceptible to interest rate and liquidity risks that could adversely affect their market value and ability to meet liquidity draws on demand, in order to assess the relative risk of such disruptions, Moody's assesses portfolio stability by evaluating the fund's asset profile (including weighted average maturity or WAM), the portfolio's liquidity position (measuring daily or weekly "buckets" relative to investor concentration and fund assets under management or AUM), and its sensitivity to market risk (estimating the fund's net asset value or NAV under certain stress conditions).

Moody's observes that asset concentration of MMF investments may increase the risk of redemption payment disruptions, the risk of higher credit losses in case of liquidation, or market value declines, concentration takes several forms, including obligor concentration, asset concentration, and geographical concentration, and additionally, most money market

funds' portfolios are heavily exposed to the financial sector (mostly to banks) and to specific regions (i.e., Europe, Japan, Canada and the US), resulting in very small differences among funds relative to these factors.

As per Moody's, diversification is one of the key advantages of a money market fund that is expected by investors. In order to better differentiate among money market funds, affiliated obligors of the same corporate family are counted together as one to avoid an artificial diversification due to apparently multiple legal entities but all linked to the same parent company, e.g. investments in a bank-sponsored, fully supported, ABCP program will typically be rolled up along with any other bank exposure including time deposits or certificates of deposits. Similarly, for the purposes of measuring risk free asset concentration, several categories of assets with no or minimal risk are clubbed into one category such as (i) Aa2 or better-rated government securities, (ii) Aa2 or better government agency securities⁷; (iii) repurchase agreements, collateralized by Aa2 or better rated sovereign and or agency assets with maturities of seven days or less, and (iv) Aa2 or better rated supra-national securities (e.g., IMF, EBRD).

So the asset profile score in Moody's scorecard is based on an equal weighting of these two factors – WAM and the top three obligor concentrations.

Moody's looks to two measures to gauge liquidity risk, each measuring a different view of a fund's ability to meet investor redemptions: (a) Overnight liquidity + Aa2 or higher rated direct government obligations + committed liquidity lines/Top 3 investors, (b) Overnight liquidity + Aa2 or higher rated direct government obligations + committed liquidity lines/Fund AUM. In addition to these two quantitative measures, Moody's typically evaluates a fund's investor base and characteristics, which may affect its liquidity. We expect a fund whose investors are mostly retail to have a very different liquidity/liability profile than one with mostly institutional investors.

In the MMF rating process in order to adjust the "run risk" in certain regions like USA where the funds have right to suspend redemption, Moody's prescribes downgrading funds to mere investment grade or below following any action taken by a fund to restrict liquidity (redemption gates, redemption fees, etc.) - temporary or permanent.

(c) Portfolio Stability – Fund Exposure to Market Risk

Because shifts in the mark-to-market value of a money market fund's invested portfolio can also expose it to the risk of loss if investments decline in value or need to be liquidated to satisfy redemptions when the value of invested assets has fallen below amortized cost, Moody's, as part of assessing a fund's portfolio stability, also assess exposure to market risk.

Moody's considers a stress test of a money market fund's mark-to-market NAV as the key measure of market risk for both constant and variable NAV money market funds given the type of assets in which it invests. Moody's rate portfolios are showing low expected volatility *ceteris paribus* higher than those showing high expected volatility. Moody's conducts NAV stress test in order to measure a fund's sensitivity to a range of potential market stresses. Moody's NAV stress test compares the impact on a money market fund of a series of stresses, benchmarked to events witnessed during a financial crisis. While these stresses were not seen all at once, the objective of our stress test is to rank funds according to their sensitivity to market risk. The stress tests applied to a money market fund's portfolio are (a) yield curve shift (100 bps curve shift applied to all securities), (b) credit spread shift (100 bps increase in spread applied to Aa2 or lower rated securities) and (c) outflows (50% overnight redemption rate). Moody's applies the first two stresses to the value of the assets held by a fund, which are then re-priced. The last stress of a 50% redemption rate is supposed to simulate the need to sell at least 50% of a fund's assets in order to meet investor redemptions. Moody's recalculates the fund's NAV makes the resulting stressed NAV the basis for the market risk score on the scorecard. The above stress tests are based on historical observations of actual stress events and on certain assumptions related to the impact of such events on the fund's NAV (Moody's, 2016).

(d) Fund Volatility Return

Stress is an extreme form of volatility. For the sake of investor's awareness S&P provides fund volatility rating (FVR) of fixed income fund in the form of a forward-looking opinion about a fixed-income investment fund's volatility of returns relative to that of a "reference index" denominated in the base currency of the fund, e.g. the reference index for a bond fund denominated in U.S. dollars would be composed of U.S. government securities.

S&P determines FVRs in four steps, which include quantitative and qualitative assessments of a fund and its investment manager. In the first step, S&P assesses the historical volatility

and dispersion of fund returns relative to reference indices. In the second step, S&P assesses portfolio risk. In the third step, S&P assesses management. In the fourth step, S&P compares the fund with other similar funds. Step one results in the preliminary FVR, steps two and three result in the intermediate FVR and step four results in the final FVR (Standard and Poor's, 2017)

MORAL HAZARD PROBLEM

CRA's are criticized on different and often opposing grounds, in particular for being too lenient before the financial crisis, and for contributing to the downturn after the crisis. When aggregate liquidity is easy, ratings are inflated and on average decrease the incidence of default. By contrast, when liquidity is tight, ratings are deflated and on average increase the incidence of default.

The relationship between a client and a CRA is of a principal-agent relationship. There can be economic games between the two, the pay-offs of which can be influenced by moral hazard. A CRA can be either of two types: a committed honest type and an opportunistic type. An honest type always reports the signal truthfully. In contrast, the opportunistic type discloses the rating that maximizes its continuation payoffs. This can lead to rating inflation, measured by the probability that in equilibrium the opportunistic CRA gives a good rating to a bad project.

There are principal-agent relationships between a CRA and an issuer because of the stipulations by the financial market regulator. If the regulator allows multiple CRA's in a country, as is the case of India, the bargaining power remains in the hand of the issuer. Again a CRA can't submit the rating of the issue to the regulator without the endorsement of the client. So in order to survive in the industry a CRA has to do assign whatever rating the issuer seeks.

CONCLUSION

In the above rating methodologies of S&P and Moody's the following link between equity fund and debt fund, how downgrade of debt fund can lead downgrade of equity fund is not captured. Suppose a company A issued debt securities to an AMC F. AMC F launched debt linked funds D. Another AMC L launched the equity fund E. The subscribers' money in the equity fund E is invested on the equities of the company A. If the company A defaults on its debt obligations, both the funds D and E will

suffer. Because of the default by Amtek Auto JP Morgan had to experience haircut on its debt funds (Adajania, 2017). Had some other AMC launched an equity fund with AMTEK Auto as underlying portfolio, it also would have suffered.

Secondly Moody's shakes off or manages the risk of loss of goodwill in the wake of failure of short term debt fund rating in the case of certain systemic factors like suspending or discouraging withdrawals and redemptions, by prescribing automatic downgrade to junk.

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