Market Intelligence
& Analytics

CRISIL
An S&P Global Company

Product basket methodology for DBS Bank

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Research

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Product basket

Product baskets are based on a rule-based framework agreed with DBS Bank. The bank has provided CRISIL the following inputs for preparation of the product basket:

- List of whitelisted schemes for ranking and product basket usage
- Five risk profiles: Defensive, cautious, balanced, growth and aggressive
- Two formats of product baskets: An essential product basket where the ticket size is Rs 10,000 lump sum and a signature product basket where the ticket size is Rs 1,00,000 lump sum
- Minimum of five funds in each of the product baskets prepared for the five risk profiles

CRISIL has adopted the following steps for creation of the product basket.

CRISIL's product basket methodology

Step 1 - Map CRISIL's mutual fund ranking to the shortlisted funds provided by DBS

Step 2 - Identify asset allocation for the five risk profiles provided by DBS

Step 3 - Create product baskets based on the rules approved by DBS

Step 1 – CMFR used to map the shortlisted funds provided by DBS

The latest quarter CRISIL Mutual Fund Ranking (CMFR) will be used to map the shortlisted funds provided by DBS.

CMFR is the relative ranking of mutual fund schemes within a peer group. The basic criteria for inclusion in the ranking universe are three-year/one-year net asset value (NAV) history and AUM in excess of category cut-off limits and complete portfolio disclosure. Three-year NAV history is considered across all equity, hybrid, dynamic bond, medium-duration, medium-to-long duration, banking & public sector undertaking (PSU), corporate bond, credit risk and gilt categories, while the one-year track record is considered for liquid, low-duration, money market and ultra short-term categories.

Only open-ended schemes are considered. The ranking is based on the following parameters:

Mean return and volatility

Mean return and volatility are considered separate parameters across all categories. Mean return is the average of daily returns based on the scheme's NAV for the period under analysis and volatility is the standard deviation of these returns. While the period for analysis is three years for equity, hybrid, gilt, dynamic, medium-duration, medium-to-long duration, banking & PSU, corporate bond, credit risk, short duration categories; it is one year for liquid, low-duration, ultra short-term and money market categories. The period of analysis is broken into four overlapping periods (the latest 36, 27, 18 and nine months for the three-year period and the latest 12, nine, six and three months for the one-year period). Each period is assigned a progressive weight starting from the longest period as follows: 32.5%, 27.5%, 22.5% and 17.5%, respectively.

Outlier returns in debt funds due to a recovery are normalised while calculating mean returns and volatility.

Portfolio concentration analysis

Concentration measures the risk arising out of improper diversification. For equity securities, the diversity score is used as the parameter to measure industry and company concentration. In the case of debt schemes, the company concentration is analysed at an individual issuer specific limit. The limit is linked with the credit rating of the issuer; a high-rated issuer will have higher limits and as the rating declines, the limit is reduced progressively. The exposure to cash and equivalents beyond a defined threshold is also penalised under this parameter.

Exposure to sensitive sectors

In case of debt schemes, industry concentration is analysed for the exposure to sensitive sectors derived based on the industry risk score (IRS) for various sectors. CRISIL's assessment of IRS quantifies the credit risk associated with an industry on a uniform scale to ensure comparability across industries. The score captures the influence of various industry variables on the debt repayment ability of companies in a particular sector over a three- to four-year horizon.

Liquidity analysis

It measures the ease with which a portfolio can be liquidated. The lower the score, the better. In the case of equities, it measures the number of days to liquidate the portfolio. Liquidity is calculated by taking the average portfolio liquidity score of the past three months.

Equity liquidity is computed as follows:

Liquidity score of each stock = No. of shares held/the daily average trading volume over the past six months

Portfolio liquidity score = Weighted average liquidity score of the above

In case of debt liquidity, treasury bills (T-bills) will be treated at par and generate a better score, followed by government securities (G-secs), state development loans (SDLs) and corporate bonds. All SDLs will be treated at par and scored equal to liquid classified corporate debt. G-sec will be assessed using the security level trade data for the past three months by analysing turnover (volumes), the number of days the security is traded and the number of trades. Corporate debt liquidity is computed by classifying each security into three categories: liquid, semi-liquid and illiquid based on the (best of) spread over benchmark and the number of days traded in the past three months.

Asset quality

It measures the probability of default by the issuer of a debt security by assessing the issuer's ability to honour the debt obligation on time.

Duration

Modified duration is considered across all the debt categories except liquid to capture the interest rate risk of the portfolio. The lower the value, the better.

Tracking error

This is used only for index schemes. The tracking error is an estimation of the variability in a scheme's performance vis-à-vis the index that it tracks. The lower the tracking error, the better.

Count of negative returns

It is used as a parameter in arbitrage funds to capture downside risk of the funds.

Eligibility criteria

- Only open-ended funds are considered, both regular and direct plans are ranked separately
- NAV history
  - Three years for equity, hybrid, gilt, dynamic, medium-to-long, medium-duration, banking & PSU, corporate bond, credit risk and short-duration funds
  - One year for arbitrage, low-duration, ultra short-term, money market and liquid funds
- AUM cut-off criteria

Broad investment type^	AUM cut-offs (Rs crore)
Equity	10
Debt and hybrid	50
Debt (<1 year)	250
Liquid	1000

^ Each of the broad investment types comprises the following ranking categories:

Equity: Multi cap, flexi cap, large cap, large & midcap, midcap, small cap, focused, value/contra, ELSS, index/ETF

Hybrid: Aggressive hybrid, conservative hybrid, arbitrage

Debt: Gilt, dynamic bond, medium-to-long duration, medium-duration, banking & PSU, credit risk, corporate bond, short-duration debt (<1 year): Money market, low duration, ultra short-duration, liquid

** Cut-off to be met by funds during all the month-ends in the respective quarter, along with quarterly average AUM*

If a fund not ranked on the basis of AUM in the preceding quarter meets the AUM criteria, it will be reviewed and included in the subsequent

quarter based on the fortnightly and monthly AUM trend of the fund in the subsequent quarter.

- Complete portfolio disclosure for all three months in the last quarter
- For debt funds, fortnightly portfolios are also considered
- The following SEBI-defined categories are currently excluded from the rankings:
- Equity: Dividend yield funds, sectoral/thematic funds

Debt: Overnight funds, long-duration funds, 10-year constant maturity gilt funds, floater funds

Hybrid: Dynamic asset allocation/balanced advantage funds, multi-asset allocation funds, equity savings funds

Others: Solution-oriented funds, fund of funds, index/ETFs (other than ones replicating Nifty or Sensex)

Exclusion criteria for having excess cash and equivalents in debt funds: Funds with average cash and equivalents exposure (in one year or three years depending on the category) more than the thresholds mentioned below are excluded

Cash and equivalents exposure threshold %	Categories
>= 35%	Liquid, ultra short-term, low-duration, money market, dynamic bond
>= 25%	For rest of the debt categories (excluding gilt)

Miscellaneous:

- Index schemes that are benchmarked to indices other than S&P BSE Sensex and Nifty 50
- Not pure arbitrage funds by mandate have the option to take some net equity exposure
- Funds that are slated to merge, have discontinued/suspended fresh subscriptions and funds for which a new category has not been disclosed

Parametric weights

Equity categories:

Parameters	Large cap, large & mid cap, multi cap, flexi cap, mid cap, value/contra, focused, small cap, ELSS	Index/ETFs
Mean return (%)	55	-
Tracking error (%)	-	100
Volatility (%)	25	-
Company concentration (%)	5	-
Industry concentration (%)	10	-
Equity - liquidity (%)	5	-
Time (years)	3	3

Hybrid categories:

Parameters	Aggressive hybrid	Conservative hybrid	Arbitrage
Mean return (%)	50	50	60
Volatility (%)	25	10	25
Company concentration (%)	5	5	
Industry concentration/exposure to sensitive sectors (%)*	10	5	
Equity - liquidity (%)	10%*K	7.5%*K	
Debt - asset quality (%)	5%* (100-K)	17.5	
Debt liquidity (%)	5%* (100-K)	7.5%* (100-K)	
Modified duration (%)	-	5	
Count of negative returns (%)			15
Time (years)	3	3	1

K = Equity component in hybrid schemes

** Industry concentration for equity and the exposure to sensitive sectors for the debt portion of the portfolio*

Debt categories:

Parameters	Gilt	Dynamic, medium-to-long, medium-duration	Banking and PSU, corporate bond, credit risk, short-duration	Low-duration, money market, ultra short-term	Liquid
Mean return (%)	50	50	50	50	50
Volatility (%)	25	10	10	10	10
Company concentration (%)	-	5	5	5	5
Exposure to sensitive sectors (%)	-	5	5	5	5
Debt - asset quality (%)	-	17.5	10	10	15
Debt liquidity (%)	15	7.5	15	15	15
Modified duration (%)	10	5	5	5	-
Time (years)	3	3	3	1	1

Step 2 – Identify asset allocation for five risk profiles provided by DBS

Asset allocation involves apportioning an investment according to an investor's risk-taking ability. Different asset classes have different return trajectories and thus diversification reduces overall risk, in terms of variability of returns for a given level of expected risk.

CRISIL MI&A shall use Mean Variance optimization (MVO) process using representative indices for asset classes offered to arrive at final asset allocation.

The process followed to arrive at the strategic asset allocation is as follows:

CRISIL's asset allocation methodology

Identify appropriate indices for the asset classes

Allocate funds using mean variance optimisation

Optimise portfolios via efficient frontier

Identifying appropriate indices for gauging historical risk/return of asset classes

For optimisation of a portfolio, CRISIL MI&A Research employs market indices as proxy for each asset class. Here, the most appropriate indices are identified for the respective products/asset classes offered by the wealth manager.

For MVO, the indices considered for the respective asset classes are:

Asset class	Index
Large cap	Nifty 100 Index
Mid cap	Nifty Midcap 100 TRI
Small cap	Nifty Smallcap 250 Index TRI
Long–term debt	CRISIL Dynamic Debt Index
Short–term debt / cash	CRISIL Liquid Fund Index

Historic data of the representative indices, in terms of standard deviation and returns (weekly returns at a weekly frequency) are analysed since April 2007. This period covers a complete business cycle. All possible combinations of a portfolio using these indices are considered for optimisation.

Strategic asset allocation using mean-variance optimisation

To arrive at the strategic allocation, CRISIL MI&A Research uses mean-variance optimisation, where historical risk and return of all asset classes are optimised. The optimisation is based on Markowitz's modern portfolio theory and William Sharpe's optimisation process.

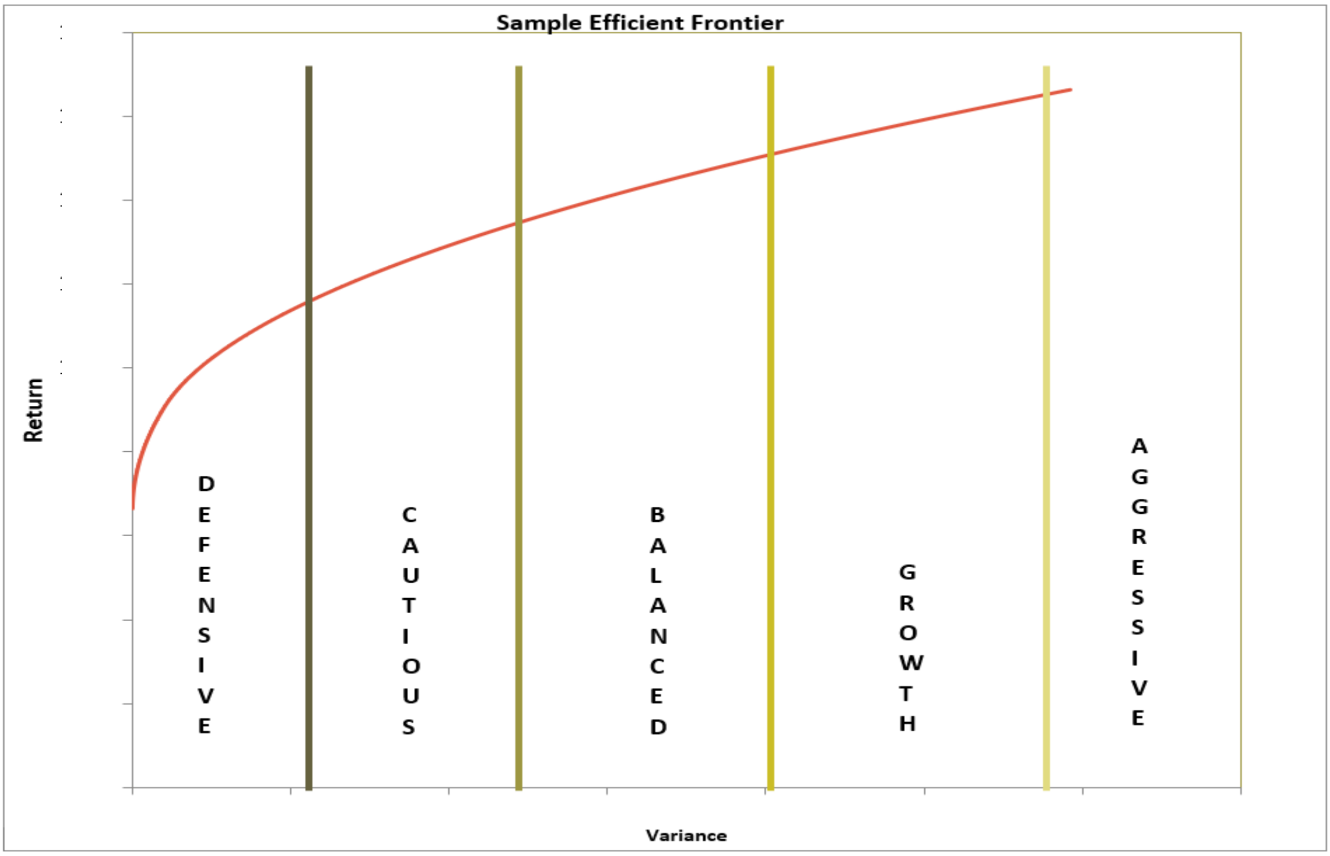
The principle here is portfolio diversification.

Diversification is based on the idea that a portfolio's riskiness depends not only on the average riskiness of its separate holdings, but also the covariance of its constituents.

In particular, the mean-variance principle formulated by Markowitz suggests that among the infinite number of portfolios that achieve a particular return objective, the investor should choose a portfolio that has the lowest variance. Alternatively, at a particular risk tolerance level, the asset allocation model should offer the maximum return to the investor.

Arriving at model portfolios based on efficient frontier

An efficient frontier (chart below) involves the plotting of portfolios with the highest expected return for each level of risk. Using a percentile approach, the efficient frontier would be segregated into the various risk profiles identified by DBS.



Additional rules for equity sub-asset allocation

As per discussion with DBS, the following constraints will be built in while running the sub- asset allocation model.. Equity exposure:

- For defensive risk profile, there will be zero exposure to equity.
- For cautious risk profiles, there will be no exposure to mid and small caps
- For balanced risk profiles, there will be no exposure to mid and small caps

There will be an appropriate allocation cap to mid-cap and small cap, as owing to exceptional returns in the past, mid-cap and small cap equities are likely to have higher allocation vs. large cap equities.

Step 3 – Creation of product basked based on DBS-approved rules

The product baskets are based on the following rules:

1) **Filter criteria provided by DBS**
   - List of white-listed schemes for ranking and inclusion in the product basket
   - Five risk profiles – defensive, cautious, balanced, growth, and aggressive
   - Two product basket formats – one termed 'Essential' product basket, where the ticket size is Rs 10,000 lump sum, and 'Signature' product basket, where the ticket size is Rs 1,00,000 lump sum
   - Minimum of five funds in each of the product baskets prepared for the five risk profiles
2) **For shortlisting of equity funds, the following criteria have been employed:**
   - Only pure large cap, mid-cap and small cap funds have been considered for fund selection to retain the sub-asset allocation % share derived from the asset allocation exercise for the five risk profiles defined by DBS
   - Funds are shortlisted based on either CMFR 1 or 2 ranking in their respective categories for four quarters
   - In case a fund from the same asset management company (AMC) appears in two or more categories of the same product basket, then the fund with better linear ranking would be included, the fund that is being excluded would be replaced with the next best fund, in terms of ranking, will be selected to avoid skewing the basket to one AMC
   - Minimum investment requirement and availability of lump sum investment in the funds is the next filtration criteria to shortlist the funds
   - In case no fund can been selected based on the above rule, then funds with CMFR 1/2 in at least three quarters will be shortlisted
   - In case no fund can be selected for any category basis the rules, then funds ranked CMFR 3 in four quarters will be shortlisted
   - In case no fund is found for any category based on the rules, then funds ranked CMFR 3 across three quarters will be selected
   - This rule will be followed till enough funds are identified to meet all the criteria for the product shortlist
3) **For shortlist of long-term debt funds, the following criteria have been used:**
   - Risk-adjusted returns (Sharpe ratio) is computed for long maturity debt fund categories (Gilt, Corporate, BPSU, Credit Risk, Medium Duration, Medium to long, Dynamic and short duration funds), based on one-year rolling returns of the past five years
   - The top three categories based on this risk-adjusted return are used for fund selection in the product basket
   - The above two filter rules will be updated annually to reduce volatility of the portfolio
   - Funds that are ranked CMFR 1 or 2 for four quarters within the shortlisted categories are identified
   - In case a fund from the same asset management company (AMC) appears in two or more categories of the same product basket, then the fund with better linear ranking would be included, the fund that is being

excluded would be replaced with the next best fund, in terms of ranking, will be selected to avoid skewing the basket to one AMC

- Minimum investment amount and availability of lump sum investment in the funds is used as the next filtration criteria to shortlist funds
- In case no fund can be picked based on the above rule, then the funds ranked CMFR 1/2 for at least three quarters will be shortlisted
- In case no fund is found for any category on the basis of the rules, then funds ranked CMFR 3 across four quarters will be shortlisted
- In case no fund is found for any category based on the rules, then funds ranked CMFR 3 across three quarters will be selected
- This rule is followed till enough funds are identified that meet all the criteria for the product shortlist

4) **For shortlist of short-term debt funds, the following criteria have been employed:**
   - Volatility (standard deviation) is computed of short maturity debt fund categories, based on one-year rolling returns for the past five years
   - The four categories in this segment, viz liquid, low duration, ultra-short term, and money market funds are sorted based on volatility, least to most
   - The above two filters will be updated annually to reduce volatility in the product portfolio
   - Funds that are ranked CMFR 1 or 2 for four quarters within the shortlisted universe are identified
   - In case a fund from the same asset management company (AMC) appears in two or more categories of the same product basket, then the fund with better linear ranking would be included, the fund that is being excluded would be replaced with the next best fund, in terms of ranking, will be selected to avoid skewing the basket to one AMC.
   - Minimum investment amount and availability of lump sum investment in the funds is the next filter to shortlist the funds
   - In case no fund can be selected based basis the above rule, then funds that are CMFR 1/2 for at least three quarters will be shortlisted
   - In case no fund is found for any category basis the rules, then funds that are CMFR 3 for four quarters will be shortlisted
   - In case no fund can be identified for any category basis the rules, then CMFR 3 funds across three quarters will be selected
   - This rule is to be followed till enough funds are identified that meet all the criteria for the product shortlist

5) **For rebalancing of funds within the portfolio basket:**
   - If any of the shortlisted funds slip to CMFR 3 and are in the ranking band 3 for two subsequent quarters, and in case there is another fund in the category that meets the methodology and is ranked better, i.e. CMFR 2, then that fund will be included in the portfolio, based on inputs from DBS
   - In case any fund falls below CMFR 3, the fund will be replaced with a new fund in the product basket, in consultation with DBS

6) **Profile-specific inputs**

- In the aggressive portfolio, the 30% exposure to small cap will be divided in two funds, as small caps have the least overlap between them
- In a balanced portfolio, two large cap funds will be included to provide benefits of diversification

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