



NSE Indices Limited

(Formerly known as India Index Services & Products Limited-IISL)

NIFTY Multi-Factor Indices

Methodology Document

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Introduction

NIFTY Multi-Factor Index series includes indices that are designed to reflect the performance of portfolio of stocks selected based on combination of 2 or more factors such as Quality, Value, Alpha and Low Volatility.

Investments where stocks are screened based on multiple factors have gained popularity among global investment community. By combining the well-established factors used in active investment and rules based framework of passive investment, factor indices tend to deliver risk premium in long term in a transparent, rule-based and cost effective manner. NSE Indices Limited maintains various indices based on single factors including Alpha, Quality, Low Volatility and Value. Below is the list of newly launched NIFTY multi-factor indices

1. NIFTY Alpha Low-Volatility 30
2. NIFTY Quality Low-Volatility 30
3. NIFTY Alpha Quality Low-Volatility 30
4. NIFTY Alpha Quality Value Low-Volatility 30

The multi-factor indices intend to capture the long term risk premia by diversification across 4 factors namely: Alpha, Quality, Low Volatility and Value. By doing so, it intends to counter the cyclical nature of single factor index strategy and provides investors a choice to take exposure to multiple factors through a single index product.

Highlights

- The index series has a base date of April 01, 2005 and a base value of 1000
- Stocks from NIFTY 100 and NIFTY Midcap 50 at the time of review are eligible for inclusion in the indices
- Indices consist of well diversified portfolio of 30 stocks selected based on combination of 2 or more factors from the 4 factors – Alpha, Quality, Value and Low-Volatility
- Stock selection and weights are derived from factor scores resulting in portfolio capturing the essence of underlying factor dynamics
- With threshold mechanism that lays down stringent criteria for inclusion and exclusion, the index seeks to minimize degree of churning and replication cost

Methodology

Eligibility criteria

- All constituents forming part of NIFTY 100 and NIFTY Midcap 50 at the time of review are eligible for inclusion in the index
- Stocks should be available for trading in derivative segment (F&O)
- Constituents should have a minimum listing history of 1 year

Stock Selection and stock weights:

Composition of single factors:



Computation of single factor scores

Single Factors	Stock Selection and weighing process			
	Parameter score	Weighting	Factor level Z score	Factor level percentile score
Quality	Return on Equity	33.33%	Aggregate Quality Z score	Percentile Distribution of Quality Z score
	Debt to Equity Ratio	33.33%		
	EPS growth variability in 5 years	33.33%		
Value	Price to Earnings Ratio* ¹	30%	Aggregate Value Z score	Percentile Distribution of Quality Z score
	Price to Book Value Ratio* ¹	20%		
	Return on Capital Employed* ¹	40%		
	Dividend Yield* ¹	10%		
Alpha	Jensen's Alpha based on CAPM	100%	Alpha Z score	Percentile Distribution of Alpha Z score
Low Volatility	Inverse of Standard deviation of daily price returns	100%	Low Vol Z score	Percentile Distribution of Low Volatility Z score

*¹ Refer to annexure for details on different weight combinations used for the calculation of value z score

Factor Weights in Multi-factor Indices

Index	Factors Weights				Selection	Weights
	Alpha	Low-Vol.	Quality	Value		
NIFTY Alpha Low-Volatility 30	50%	50%	-	-	Top 30 stocks based on weighted average percentile score	Based on weighted average factor level Z Score. Weights of stocks are capped at 5%
NIFTY Quality Low-Volatility 30	-	50%	50%	-		
NIFTY Alpha Quality Low-Volatility 30	33.33%	33.33%	33.33%	-		
NIFTY Alpha Quality Value Low-Volatility 30	25%	25%	25%	25%		

Reconstitution & Rebalancing criteria

- The Indices will be reconstituted semi-annually
- Top 10 stocks based on average percentile score are compulsorily included in the index
- An existing constituent is compulsorily excluded if its rank based on Average percentile score drops below 50
- Weights of stocks are capped at the lower of 5% or 5 times the weight of the stock in the index based only on free float Mcap
- Weights may drift between rebalancing due to movement in stock prices
- Apart from the scheduled review, additional ad-hoc reconstitution and rebalancing of the index will be initiated in case any of the index constituents under goes suspension, delisting or scheme of arrangement
- Further, on a quarterly basis indices will be screened for compliance with the portfolio concentration norms for ETFs/ Index Funds announced by SEBI on January 10, 2019. In case of non-compliance, suitable corrective measures will be taken to ensure compliance with the norms.

Calculation Frequency:

The index is calculated on an end of day basis for all days National Stock Exchange of India is open for trading in equity shares.

Index Governance:

A professional team at NSE Indices Limited manages the index. NSE Indices Limited has constituted the Index Advisory Committee (Equity), which provides guidance on macro issues pertaining to equity indices. The Index Maintenance Sub-committee makes all decisions on additions and deletions of companies in equity indices and Index Advisory Committee (Debt) provides guidance on macro issues pertaining to fixed income indices. The Committees comprises of representatives from financial market such as Asset Management Company, insurance company, rating agency etc. In order to maintain transparency, the names of the committee member are publicly displayed on the website. None of the member in the above committee except the exchange representative(s) (who co-ordinates between the Index Advisory Committee - Equity and IMSC) represent more than one committee and thereby the independence of each of the committees is maintained.

Annexure:

Factor Mathematics

Z score of factors considered for the index are calculated based on the weighted average Z score of underlying parameter which is discussed below.

1) Quality Factor:

- Quality score is calculated on the basis of return on equity (ROE), debt-to-equity (D/E) ratio and EPS growth variability in the previous 5 years. D/E is not considered for companies belonging to financial services sector
- Companies with negative EPS in the previous 6 years are excluded
- To derive Z-Score, for non-financial service company, equal weightage is given to ROE, D/E and EPS growth variability in the previous 5 years. For Financial Service sector company, 50% weightage is given to ROE & EPS growth variability
- Average weighted Z score is calculated for all securities as per the following formula:

*Quality Z score (Non- Financial service sector) = (1/3) * Z score of ROE + (1/3) * (-Z score of D/E) + (1/3) * (-Z score of EPS growth variability)*

*Quality Z score (Financial service sector) = .5 * Z score of ROE + .5 * (-Z score of EPS growth variability)*

2) Value Factor:

- Value Z score are calculated on the basis of ROCE (Return on Capital Employed), PE, PB and Dividend yield (DY)
- Average weighted Z score is calculated for all securities as per the following formula

*Value Z score= 0.3 * (-Z score of P/E) + 0.2 * (-Z score of P/B) + 0.4 * (Z Score of ROCE) + 0.1 *(Z score of Div. Yield)*

- In case quality is also one of the factor in the index then average weighted Z score is calculated for all securities as per the following formula

*Value Z score= 0.3 * (-Z score of P/E) + 0.3 * (-Z score of P/B) + 0.2 * (Z Score of ROCE) + .2 *(Z score of Div. Yield)*

3) Low Volatility Factor:

- Low Volatility Z score is calculated using the inverse of Std. deviation based on previous 1 year prices returns

4) Alpha Factor:

- Alpha Z score is calculated for all securities on the basis of Jensen's Alpha based on previous 1 year prices, where market portfolio is NIFTY 50.

Calculation of Alpha: $\alpha_s = r_s - [r_f + \beta_s (r_m - r_f)]$

α_s : Alpha of the stock

r_s : Average of daily return of security during previous 12 months

r_f : Average of daily 3 Month MIBOR rate during previous 12 months

r_m : Average of daily return of index i.e. NIFTY 50

β_s : Beta of the security calculated based on previous 12 month period.

Z score of the factors are converted into Factor score based on the following formula

Factor Score = (1+ Average Z score) if Avg. Z score >0

1/ (1-Average Z score) if Avg. Z score < 0

Percentile score is calculated from the factor score for every eligible security with security having the highest factor score getting the highest percentile score.

About National Stock Exchange of India Limited (NSE):

The National Stock Exchange of India Ltd. (NSE) is the leading stock exchange in India and the third largest in the world by nos. of trades in equity shares in 2017, according to World Federation of Exchanges (WFE) report. NSE was the first exchange in India to implement electronic or screen based trading. It began operations in 1994 and is ranked as the largest stock exchange in India in terms of total and average daily turnover for equity shares every year since 1995, based on SEBI data. NSE has a fully-integrated business model comprising exchange listings, trading services, clearing and settlement services, indices, market data feeds, technology solutions and financial education offerings. NSE also oversees compliance by trading and clearing members with the rules and regulations of the exchange. NSE is a pioneer in technology and ensures the reliability and performance of its systems through a culture of innovation and investment in technology. NSE believes that the scale and breadth of its products and services, sustained leadership positions across multiple asset classes in India and globally enable it to be highly reactive to market demands and changes and deliver innovation in both trading and non-trading businesses to provide high quality data and services to market participants and clients.

For more information, please visit: www.nseindia.com

About NSE Indices Limited:

(Formerly known as India Index Services & Products Limited-IISL)

NSE Indices Limited, a subsidiary of NSE, provides a variety of indices and index related services for the capital markets. The company focuses on the index as a core product. The company owns and manages a portfolio of indices under the NIFTY brand of NSE, including the flagship index, the NIFTY 50. NIFTY equity indices comprises broad-based benchmark indices, sectoral indices, strategy indices, thematic indices and customised indices. NSE Indices Limited also maintains fixed income indices based on Government of India securities, corporate bonds, money market instruments and hybrid indices. Many investment products based on NIFTY indices have been developed within India and abroad. These include index based derivatives traded on NSE, Singapore Exchange Ltd. (SGX) and Taiwan Futures Exchange (TAIFEX) and a number of index funds and exchange traded funds. The flagship 'NIFTY 50' index is widely tracked and traded as the benchmark for Indian Capital Markets.

For more information, please visit: www.niftyindices.com

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