

CNI AlphaFocus CES SmartBeta Factor Index Series Methodology

The CNI AlphaFocus CES SmartBeta Factor Index Series are designed to reflect the performance of investment strategies that focus on exposures of different factors, and to provide innovative SmartBeta investment instruments and performance benchmarks.

1. Code and Name

Index Name: CNI AlphaFocus CES Size Factor Index

Short Name: Size Factor

Index Code: 980055

Index Name: CNI AlphaFocus CES Value Factor Index

Short Name: Value Factor

Index Code: 980056

Index Name: CNI AlphaFocus CES Momentum Factor Index

Short Name: Momentum Factor

Index Code: 980057

2. Base Date and Base Point

Base Date: December 31, 2014

Base Point: 1000

3. Index Universe

Index Universe of the factor indices are constituents of SZSE 1000 Index.

4. Selection Criteria

The factor index series select stocks with sufficient trading days, high factor exposure and low volatility as constituents. Specific steps are as follows:

- (1) For each stock in the broad selection universe, a rolling 252-day linear regression is performed using stock's daily return on size, value and momentum factors, and the corresponding factor exposures as of cut-off date T are generated and denoted as $\beta_{iT, smb}$, $\beta_{iT, hml}$ and $\beta_{iT, mom}$.
- (2) Standardize the exposures in step (1) using their time series mean and volatility estimations:

$$\tilde{\beta}_{iT} = \frac{\beta_{iT} - \text{mean}}{\text{volatility}}$$

and get the standardized exposures for each stock i at time T as $\tilde{\beta}_{iT, \text{smb}}$, $\tilde{\beta}_{iT, \text{hml}}$ and $\tilde{\beta}_{iT, \text{mom}}$.

(3) Further narrow down the selection universe for each factor by taking into account the interaction between the exposures we obtained in (2) and the market cap and ROE for each stock. A final cross-sectional winsorization and standardized is then performed for exposures $\tilde{\beta}_{iT, \text{smb}}$, $\tilde{\beta}_{iT, \text{hml}}$, $\tilde{\beta}_{iT, \text{mom}}$ within the final selection universe and the final score is denoted as z_{iT} .

(4) Estimate the volatility for stock i as of cut-off date T

$$\sigma_{r_{iT}} = A\sigma_i + B\sigma_{iT, \text{EWMA}}$$

where σ_i is stock i 's sample standard deviation as of $T-1$, $\sigma_{iT, \text{EWMA}}$ is stock i 's exponentially weighted moving-average standard deviation as of $T-1$, A and B are constant parameters.

(5) Calculate each stock's weight in the factor portfolio as

$$w_{iT} = \begin{cases} \frac{z_{iT}/\sigma_{r_{iT}}^2}{\sum_{\forall j} z_{jT}/\sigma_{r_{jT}}^2}, & z_{iT} > 0 \\ 0, & \text{else} \end{cases}$$

Select the top 50 weight stocks as the constituents of the corresponding factor index, and then adjust the weight of the constituents again to sum to 1. Do this separately for each factor.

5. Index Calculation

The indices are calculated according to the Paasche weighted method, real-time calculation is carried out daily according to the following formula:

$$\begin{aligned} &\text{real time index} \\ &= \text{last trading day closing index} \\ &\times \frac{\sum (\text{constituent's real time stock price} \times \text{No. of shares} \times \text{adjustment factor})}{\sum (\text{constituent's last trading day closing price} \times \text{No. of shares} \times \text{adjustment factor})} \end{aligned}$$

For adjustment method of No. of shares, please refer to *Index Calculation and Maintenance Methodology*. For adjustment factor, please refer to ‘7.Adjustment for Constituents’ Weights’.

6. Index Review

6.1 Periodic Review

The indices are reviewed semi-annually. Periodic reviews are implemented on the next trading day after market closing of the second Friday in June and December each year. Announcements of periodic reviews are published two weeks before implementation.

After new constituents are determined, remaining stocks will be ranked by factor weight in descending order and 5% of the total number of index constituents will be selected as reserved stocks.

6.2 Non-periodic Review

If a constituent is subject to suspension of listing or delisting, it will be replaced by the highest ranked reserved stock.

For constituents subject to risk alert, M&A and split, please refer to SZSE 1000 Index Methodology.

7. Adjustment for Constituents' Weights

In index calculation, the adjustment factor is designed to set the weight of individual constituent no more than 10% in each period review.

The adjustment factor is recalculated twice a year and implemented in periodic reviews. The adjustment factor generally remains constant before next periodic review.

In case of non-periodic review, the new constituent inherits the weight of the replaced stock on its last trading day before the

review. The adjustment factor for the new constituent is calculated accordingly.

8. Index Release and Maintenance

This series of indices is jointly researched and developed by Shenzhen Securities Information Co., Ltd., AlphaFocus Investment Research LLC, and China Exchanges Services Co., Ltd.

Shenzhen Securities Information Co., Ltd. is responsible for index compilation, calculation, release, maintenance and rights management.