

# **MSCI EMU 50 OPERA 5/3 SETTINGS INDEX METHODOLOGY**

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## 1 Introduction

The MSCI EMU 50 OPERA<sup>1</sup> 5/3 Settings Index<sup>2</sup> (the “Index”) aims to replicate the performance of the strategy that targets 5% of volatility by varying the weights of the MSCI EMU Top 50 Index (the “Parent Index”) and a cash-like component which aims to represent a constant payout of 3% annually.

The Index is not designed or intended to be used as the basis for funds, derivatives, structured products or other financial instruments or products that solely aim to replicate the performance of an index.

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<sup>1</sup> OPERA - Objective “P” Equity Risk Allocation

<sup>2</sup> 5/3 Settings refer to targets of 5% volatility target and a calculated constant payout of 3%

## 2 Constructing the Index

The MSCI EMU 50 OPERA 5/3 Settings Index takes into account the two components:

1. Return of the MSCI EMU Top 50 Index<sup>3</sup>
2. The cash-like component which accrues daily with an annualized yield of 3%.

The Index calculation formulae are as described below:

$$IL_t = IL_{t-1} \times (1 + IR_t)$$

where:

$IL_t$  is the Index level on day t

$IR_t$  is the Index return on day t, calculated in accordance with the following formula:

$$IR_t = W_t \times E_t + (1 - W_t) \times C_t$$

where:

$$W_t = \text{Minimum} \left( 1, \frac{\text{TargetRiskLevel}}{\sigma_{t-i}} \right)$$

where:

$$\text{TargetRiskLevel} = 5\%$$

$\sigma_{t-i}$  volatility<sup>4</sup> of the Parent Index on  $t - i$ , where  $i$  is the number of “days lag” in the return calculation used for computing volatility (i.e., the lag between the return date and the volatility calculation date), 2 days

$$E_t = \frac{\text{Parent Index}_t}{\text{Parent Index}_{t-1}} - 1$$

$$C_t = 3\% \times \frac{\text{ACT}(t - 1, t)}{360}$$

where:

$\text{ACT}(t - 1, t)$  = number of actual calendar days between day t-1 and t

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<sup>3</sup> Daily price return in EUR currency

<sup>4</sup> Please refer to Appendix for more information on volatility calculation

## **3 Maintenance of the Index**

### **3.1 INDEX REVIEWS AND ONGOING EVENT RELATED CHANGES**

The Index is derived from the existing underlying Parent Index. As a result, index reviews and corporate events are reflected in the Index as they occur and as they are captured in the underlying Parent Index.

## Appendix: Volatility Estimation

The price returns of the Parent Index in EUR are used for volatility estimation. The volatility estimation approach takes into account both the short-term and the long-term volatility trends of the Parent Index.

The volatility of the Parent Index is calculated as the maximum of two volatility estimates: the short-term realized volatility estimate, calculated over a short horizon of 20 days, and the long-term realized volatility estimate, calculated over a long horizon of 60 days. The volatility estimation approach uses equally weighted daily price returns of the Parent Index for both horizons.

The volatility calculation formulae are described below:

$$Volatility_t =$$

$$Max(Short-term Realized Volatility_t, Long-term Realized Volatility_t)$$

Where:

$$Realized Volatility_t = \sqrt{252 \times Variance(t)}$$

$$Variance(t) = (1/N) \times \sum_{t-N+1}^t \left\{ \ln \left( \frac{Index_t}{Index_{t-1}} \right) \right\}^2$$

Where:

$N$  = Total number of historical trading days used for variance calculation and varies for Short-term Realized Volatility ( $N = 20$ ) and Long-term Realized Volatility ( $N = 60$ )

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