

FAIR VALUE METHODOLOGY

ETF Services

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INTRODUCTION

This document describes an approximation method called *Fair Value Calculation* which aims to provide a more accurate methodology to price instruments after the market close.

This is achieved through the use of interpolation techniques to apply specific market future returns to the latest historical closing price of the corresponding Instrument.

Solactive provides a customer-based service which can be adjusted in the following way:

- > The corresponding Market Index can be freely chosen for every Exchange Listing.
- > The customer chooses which Instruments are to be approximated and which should remain stale during market closing times.
- > Approximation techniques can be applied without further restrictions or can be specified further to meet additional criteria, i.e. when the Market Index Future deviates by more than 1% since the market is closed.

On the following page we state the Methodology of how proxies are calculated.



1 FAIR VALUE CALCULATION

1.1 CALCULATION FORMULA

The Index Value on a Business Day at the relevant time is calculated in accordance with the following formula:

$$Index_t = \sum_{i=1}^n \frac{(x_{i,t} \times p_{i,t} \times f_{i,t})}{D_t}$$

With:

- $x_{i,t}$ = Number of Index Shares of the Index Component i on Trading Day t
- $p_{i,t}$ = Price of Index Component i on Trading Day t
- $f_{i,t}$ = Foreign exchange rate to convert the Price of Index Component i on Trading Day t into the Index Currency
- D_t = Divisor on Trading Day t

If the market is closed for some Component i , the price is calculated as follows:

$$p_{i,t} = p_{i,c} * (1 + \beta_i * \Delta F_{i,t})$$

With:

- $p_{i,t}$ = Price of the Index Component i on Trading Day t
- $p_{i,c}$ = Closing Price of Index Component i on Trading Day t
- $\beta_i = \frac{\text{Cov}(r_i, r_{M,i})}{\text{Var}(r_{M,i})}$
- $\text{Cov}(r_i, r_{M,i})$ = Covariance between the returns of Instrument i and a corresponding Market Index M with respect to i .
- $\text{Var}(r_{M,i})$ = Variance of the returns of Instrument i and a corresponding Market Index M with respect to i .

$$\Delta F_{i,t} = \frac{F_{i,t} - F_{i,c}}{F_{i,c}} \quad \text{Returns of a Future of the Market Index } M \text{ with respect to } i \text{ since Market closing of Instrument } i.$$

1.2 BETA CALCULATION

The betas are monitored constantly and evaluated on a daily basis.

Solactive uses Adaptive Volatility Techniques to secure the most accurate approximation results.

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