



# INDEX GUIDE

MVIS-WAVEBRIDGE BITCOIN PLUS ALTCOINS MOMENTUM INDEX

VERSION 1.0 | 07.2021

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## 1 INTRODUCTION

### 1 Introduction

In accordance with Art. 13 No. 1 (a) of Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 (the "Benchmark Regulation"), this document provides the rules for establishing, calculating and maintaining the MVIS-Wavebridge Bitcoin Plus Altcoins Momentum Index ("MWBPM").

#### 1.1 Objective of Index

The MVIS-Wavebridge Bitcoin Plus Altcoins Momentum Index tracks the performance of a portfolio of Bitcoin and other Altcoins weighted by momentum factor.

The index aims to achieve:

- Exposure to large-cap crypto assets exhibiting relatively higher momentum to Bitcoin
- Smart index-based access to factors that have historically driven a significant part of crypto assets' risk and return
- Exposure and risk management within a crypto asset

The MVIS-Wavebridge Bitcoin Plus Altcoins Momentum Index is constructed as a convex combination based on the past performances of the two main components of the index: Bitcoin and a basket of non-Bitcoin crypto assets ("Altcoins") that are weighted based on the momentum score.

#### 1.2 About Wavebridge

Wavebridge is a global digital assets data management and financial investment solutions provider. The company specializes in providing financial investment solutions based on "quantitative analysis", which analyzes changes in the financial markets. Wavebridge focuses on integrating financial engineering methods to blockchain technology, utilizing its existing quant solutions with digital assets. By utilizing AI technology and its data analysis, Wavebridge offers its services to financial institutions and professional investors.

#### 1.3 About MarketVector Indexes GmbH

MVIS® is a registered trademark of Van Eck Associates Corporation and therefore protected globally against unlawful usage. MarketVector Indexes has selected an index calculation agent to calculate the index.

#### 1.4 Approval of Index Methodologies

The Index Owner has established the Indexes and their individual methodology covered in this Index Guide. A detailed written "Procedure for Index Development" describes the steps and approvals required to develop, document and approve an Index and its methodology. The intention of the Procedure for Index Development is to ensure that the methodology of an Index meets the requirements of Art. 12 of the Benchmark Regulation and is approved and implemented according to a robust and reliable process.

The methodology for each index and its methodology covered in this Index Guide has been analysed by the Index Administrator's Index Operations department in order to ensure that it is robust and reliable, has clear rules on use of discretion, allows sustainable validation (based on reasonable back testing) and is traceable and verifiable. Furthermore, the size, liquidity and transparency of the underlying market for each methodology has been tested and particular circumstances for each relevant market have been taken

## 1 INTRODUCTION

into account.

Each index methodology and the related detailed analysis was presented by the Index Operations Department to the Independent Oversight Function for its approval. Based on the aforementioned approval process and its documentation each Index Methodology was presented to the Management Board (Geschäftsführer) of the Index Administrator for final approval.

### 1.5 Review of this Index Guide

According to Art. 13 No. 1 (b) of the Benchmark Regulation, the Index Administrator reviews this Index Guide on an annual basis and immediately in case of special circumstances that require a review. The review takes place in meetings attended by the Independent Oversight Function and the Management Board of the Index Administrator. If changes to this Index Guide are considered necessary, the process described in Section 4.7 applies.

## 2 GENERAL DEFINITIONS

### 2 General Definitions

#### 2.1 Index Dissemination and Identifiers

The index is calculated with the constituent prices converted to USD, on a daily basis between 00:00 and 24:00 (UTC). Dissemination is in USD. Real-time index values are calculated with the latest available prices each 15 seconds. The closing value is calculated at 17:00:00 CET/CEST with fixed 17:00 CET/CEST exchange rates.

The MVIS-Wavebridge Bitcoin Plus Altcoins Momentum Index has the following identifiers:

| Index Type         | ISIN         | SEDOL   | WKN    | Bloomberg | Reuters |
|--------------------|--------------|---------|--------|-----------|---------|
| Price Return Index | DE000SL0D5G6 | BP6SB21 | SL0D5G | MWBPM     | .MWBPM  |

The index was launched on 26 August 2021 with a base index value of 100.00 as of 31 December 2017.

#### 2.2 Review Schedule

The indexes are rebalanced monthly (the "Monthly Rebalance Date"). The reviews for the indexes are based on the opening data (adjusted for reviewed amount outstanding) on the fourth from the last business day in that month. If a security does not trade on a business day, then the last available price for this security will be used.

A "business day" means any day (other than a Saturday or Sunday) on which commercial banks and foreign exchange markets settle payments in Frankfurt.

Adjustments to constituents will be announced four business days prior to the first business day of the next month at 23:00 CET/CEST.

The indexes are rebalanced at 17:00:00 CET/CEST of the last trading day in each month.

#### 2.3 Pricing Source

For each component price, the CCCAGG Price Index by CryptoCompare ([www.cryptocompare.com](http://www.cryptocompare.com)) is used. CCCAGG is a weighted average of the latest available trading price at each exchange. Exchanges can be added/removed by decision of CryptoCompare.

For clarification, 'CCCAGG' means CCCAGG as published on the website with the following deviations:

- Exchanges may be excluded if they are not licensed to be added to an index.
- Exchanges are not immediately added/removed, but only on a monthly basis or if required following quality reviews from CryptoCompare.
- Values are not backadjusted.

## 3 Monthly Review

### 3.1 Index Universe

The index universe includes all crypto currencies traded on the exchanges covered by the CCCAGG pricing provided by Crypto Coin Comparison Ltd. ("CryptoCompare").

### 3.2 Eligible Index Universe

The index does not include crypto assets that:

- are tied to a fiat currency, crypto assets, or a commodity,
- are ongoing ICOs,
- are designed to be anonymous or private,
- have been newly created in the last 6 months, other than hard forks of existing assets,
- do not trade against a common fiat currency, i.e. USD or EUR,
- are outside of the top 30 rankings based on market capitalization,
- have less than \$25M of an average daily trading volume over the past 1 month,
- do not publish websites or whitepapers in English.

### 3.3 Index Selection

- The assets and tokens fulfilling the universe criteria above are ranked by their market capitalization in descending order
- The top 8 crypto assets qualify for selection

### 3.4 Weighting Scheme

For each crypto asset  $i$ ,  $i = 1$  stands for Bitcoin and  $i = 2, \dots, 8$  stands for top 7 Altcoins in descending order by market capitalization.

The  $n$  days momentum factor at the rebalancing date  $T$  for each crypto asset  $i = 1, \dots, 8$  is defined as

$$M_{Ti}(n) = \frac{P_i(T)}{P_i(T-n)} - 1,$$

where  $P_i$  = the price of a crypto asset  $i$ .

Altcoins are weighted based on the past 15 and 30 days, momentum factors that are normalized and transformed to be positive to prevent short-selling positions.

First, rescaled momentum factors for 15 and 30 days are defined as

$$\widetilde{M}_{Ti}(n) = \frac{M_{Ti}(n)}{\sigma_{Ti}(30)} \quad \text{for } n = 15, 30,$$

### 3 MONTHLY REVIEW

Where

$\sigma_{T_i}(n)$  = a standard deviation of the set of  $R_i(k)$  such that  $T - n + 1 \leq k \leq T$ ,  
 $R_i(k)$  =  $M_{ki}(1)$  which means the daily return of a crypto asset  $i$  between the date  $k - 1$  and  $k$ .

The rescaled momentum factors for 15 and 30 days are normalized as

$$Z_{T_i}(n) = \frac{\widetilde{M}_{T_i}(n) - \widetilde{\mu}_T(n)}{\widetilde{\sigma}_T(n)},$$

where

$\widetilde{\mu}_T(n)$  = an average of  $\widetilde{M}_{T_i}(n)$  such that  $i = 1, \dots, 8$ ,  
 $\widetilde{\sigma}_T(n)$  = a standard deviation of  $\widetilde{M}_{T_i}(n)$  such that  $i = 1, \dots, 8$ .

Then the momentum score of each crypto asset  $i$  at the date  $T$  is computed as an average of rescaled and normalized momentum factors for 15 and 30 days with an adjustment to have the range of positive values:

$$S_i(T) = f\left(\frac{Z_{T_i}(15) + Z_{T_i}(30)}{2}\right),$$

where

$$f(x) = \begin{cases} 1 + x & \text{if } x \geq 0 \\ \frac{1}{1-x} & \text{otherwise} \end{cases}$$

The weight of 7 Altcoins is calculated as:

$$w_i(T) = \frac{S_i(T)}{\sum_{i=2}^8 S_i(T)}.$$

To calculate the performance factor, a daily return of Bitcoin,  $R_1(k)$ , and a daily return of a basket of 7 Altcoins,  $R_{alt}(k)$ , are used and defined as follows:

$$R_1(k) = M_{k1}(1) \quad \text{and} \quad R_{alt}(k) = \sum_{i=2}^8 w_i(T^-) M_{ki}(1)$$

where  $T^-$  = rebalancing date in the previous month.

Then  $F_i(T)$  is a performance for the month of the rebalancing date  $T$  and calculated according to the following:

$$F_i(T) = \frac{\text{an average of } \{R_i(T), R_i(T-1), \dots, R_i(T-29)\}}{\text{a standard deviation of } \{R_i(T), R_i(T-1), \dots, R_i(T-29)\}} \quad \text{for } i = 1, alt$$

### 3 MONTHLY REVIEW

The performance factor of Bitcoin ( $i = 1$ ) at the date T is given a lower bound of 30% and an upper bound of 80%, it, therefore, is defined as

$$Performance\ Factor_1(T) = g\left(\frac{f(F_1(T))}{f(F_1(T)) + f(F_{alt}(T))}; 0.3, 0.8\right),$$

where

$$f(x) = \begin{cases} 1 + x & \text{if } x \geq 0 \\ \frac{1}{1-x} & \text{otherwise} \end{cases}, \quad g(x; 0.3, 0.8) = \begin{cases} x & \text{if } 0.3 \leq x \leq 0.8 \\ 0.3 & \text{if } x < 0.3 \\ 0.8 & \text{otherwise} \end{cases}$$

and the performance factor of a basket of Altcoins ( $i = alt$ ) is

$$Performance\ Factor_{alt}(T) = 1 - Performance\ Factor_1(T).$$

The final weights for Bitcoin and Altcoins will be then calculated as below:

For Bitcoin:

$$W_1^*(T) = Performance\ Factor_1(T).$$

For each Altcoin:

$$W_i^*(T) = w_i(T) \times Performance\ Factor_{alt}(T) \quad \text{for } i = 2, \dots, 8.$$

The weighting cap/floor factor is calculated as

$$Cap\ Factor_i = \frac{W_i^*}{\frac{Market\ Capitalization_i}{\sum_{i=1}^8 Market\ Capitalization_i}} \quad \text{for } i = 1, \dots, 8.$$



## 4 ONGOING MAINTENANCE

### 4 Ongoing Maintenance

#### 4.1 Changes in Circulating Supply

Changes in the circulating supply will not be adjusted during the month, but with the next monthly review.

#### 4.2 Changes due to Forks

A hard fork occurs when a blockchain protocol is radically changed, such that it becomes incompatible with older versions. In effect, participants taking part in transactions on the old blockchain must upgrade to the new one in order to continue validating transactions. However, participants that do not upgrade may continue to support and validate transactions on the older blockchain protocol separately.

The result of this is that a blockchain splits into two - hence the name 'hard fork'. If there are nodes permanently supporting the new chain, then the two chains will co-exist.

Users that once held digital assets on an older blockchain before the protocol change at a pre-specified blockchain length will now also hold an amount of new coins on the altered blockchain. This new asset has essentially been derived from an older token as well as its associated blockchain's transaction history.

In case of a hard fork, the forked digital asset is not added to the index.

#### 4.3 Airdrops

In case of an airdrop, the airdrop is not added to the index.

#### 4.4 Changes to Pricing (CCCAGG)

In case an exchange is added to CCCAGG or removed from it, the index divisor will not be adjusted.

#### 4.5 Index Corrections

- Index corrections distinguish between calculation errors and incorrect input data.
- Calculation errors detected within a trading day are corrected immediately. Intraday tick data are not corrected retrospectively.
- Calculation errors that are older or based on erroneous input data are corrected if technically possible and economically viable. If significant differences exist, index values can also be corrected retrospectively.

#### 4.6 Review of Index Concept

Due to a very dynamic market of crypto assets and tokens the index methodology, parameters and thresholds will be reviewed at least once a year. Market participants feedback will be considered in the process whether or not to make amendments to the methodology and the data sourcing process. Any changes will be communicated by Wavebridge and MarketVector Indexes with a 30-day lead time to enable customers to adjust their processes.

## 4 ONGOING MAINTENANCE

### 4.7 Changes to the Index Guide

Any changes to the Index Guide will be reviewed and approved by the Index Owner and MarketVector Indexes' Legal and Compliance Department. Legal and Compliance may also request a conclusive description and further information on any change and may consult the operations department on such changes. The key elements to be analysed in this phase of the change process are robustness, transparency, reliability and integrity. The result of the review will be communicated to the operations department. The email will be archived by the operations department.

In case of changes that might immediately change the composition of an index or must be considered material for any other reason also need to be approved by the Independent Oversight Function ("IOF") prior to their publication and implementation.

In case of material changes an advance notice will be published and provided to users. MarketVector Indexes will generally disseminate a notification related to an Index Guide change 30 days prior to the change. A shorter period of time may be applied at MarketVector Indexes' discretion if the relevant index has not been licensed for a financial product to a third party. The notice will describe a clear time frame that gives the opportunity to analyse and comment upon the impact of such proposed material change. Any material comments received in relation to the Index Guide change and MarketVector Indexes' response to those comments will be made publicly accessible after any consultation, except where confidentiality has been requested by the originator of the comments.

### 4.8 Discretion regarding the Use of Input Data and Extraordinary Event

Pursuant to Art. 12 No.1. (b), MarketVector Indexes has established the following rules identifying how and when discretion may be exercised in the administration of an index.

In case input data are or appear to be qualitatively inferior or different sources provide different data, or a situation is not covered by the index rules, MarketVector Indexes may use or change the data at its own discretion according to the following discretion policy after a plausibility check. Regarding input data, this may include

- Liquidity and size data,
- Event information,
- Other secondary data.

Regarding extraordinary events, this may include:

- Trading stops,
- Regulatory actions,
- Hacks,
- Detection of fraud,
- Changes in custodian coverage,
- Etc.

Any changes to input data that MarketVector Indexes intends to apply because of missing data, different data from different sources or other information concluding the inappropriateness or incorrectness of data

## 4 ONGOING MAINTENANCE

must subject to reasonable discretion. The decision on any change must be required, appropriate, commensurable and in line with the respective index scope and objective and must reasonably consider in a balance weight the interest of Users, investors in related products and the integrity of the market.

Index operations ensures consistency in the use of discretion in its judgement and decision. Employees involved in the operations team must have shown the respective experience and skills. Significant decisions are subject to sign-off by a supervisor. In case of material changes to data the relevant situation will be analysed in detail, described and presented to the IOF and discussed and reviewed with the IOF.

The broad range of possible data quality problems does not allow to define specific steps for each possible instance. MarketVector Indexes will always weight the different interest of the index users, the integrity of the market and other involved parties and determine the least disadvantageous measure that equally considers the relevant interests best.

In order to avoid individual decisions in similar cases for the future an update of the index rules can be taken into consideration if applicable. Regarding the use of data, other possible mitigation measures are the change of input data sources or providers and/or own data research where possible and reasonable.

Records are kept about material judgement or discretion by MarketVector Indexes and will include the reasoning for said judgement or discretion.

### 4.9 Input Data and Contributor Selection

According to the input data requirements under Art. 11 of the Benchmark Regulation the, following shall apply with regard to the input data used for the management and provision of an index and the relevant input data providers ("Contributors"):

- the input data shall be sufficient to represent accurately and reliably the market or economic reality that the benchmark is intended to measure;
- the input data shall be transaction data, if available and appropriate. If transaction data is not sufficient or is not appropriate to represent accurately and reliably the market or economic reality that the index is intended to measure, input data which is not transaction data may be used, including estimated prices, quotes and committed quotes, or other values;
- the input data shall be verifiable;
- clear guidelines regarding the types of input data, the priority of use of the different types of input data and the exercise of expert judgement, to ensure compliance with the Index Guide and index methodology and the aforementioned requirements are defined in the Code of Conduct for Contributors; and
- where an index is based on input data from Contributors, MarketVector Indexes will obtain, where appropriate, the input data from a reliable and representative panel or sample of Contributors so as to ensure that the resulting index is reliable and representative of the market or economic reality that the index is intended to measure.

In order to control the quality of contributors, MarketVector Indexes will conduct the following controls:

- Evaluate market share, reputation, quality and cost of possible input data sources and providers before selecting them on the basis of the gathered information and data;

#### 4 ONGOING MAINTENANCE

- Compare the input data of one Contributor with the input data from one or more other Contributors in order to ensure the integrity and accuracy of the input data and in case of bad quality replace a Contributor with another Contributor.

MarketVector Indexes will not use input data from a contributor if it has any indication that the Contributor does not adhere to its Code of Conduct for Contributors and in such a case shall obtain representative publicly available data.

## 5 CALCULATION

### 5 Calculation

#### 5.1 Index Formula

The index value is calculated using the Laspeyres' formula:

$$Index\ Value = \frac{\sum_{i=1}^n p_i * q_i * cf_i * fx_i}{D} = \frac{M}{D}$$

Where (for all tokens (i) in the Index):

- $p_i$  = price,
- $q_i$  = circulating supply,
- $cf_i$  = weighting cap/floor factor (if applicable, otherwise set to 1),
- $fx_i$  = exchange rate (price currency of component to USD),
- $M$  = market capitalization of the index,
- $D$  = divisor.

#### 5.2 Input Data

The following rounding procedures are used for the index calculation:

- Rounding to 2 decimal places:
  - index values,
- Rounding to 6 decimal places:
  - divisors ( $D$ ),
- Rounding to 18 decimal places:
  - prices ( $p_i$ ),
  - exchange rates ( $fx_i$ ),
  - weighting cap/floor factors ( $cf_i$ ).

#### 5.3 Divisor Adjustments

Index maintenance - reflecting changes in circulating supply, events, addition or deletion of tokens to the Index - should not change the level of the index. This is accomplished with an adjustment to the divisor. Any change to the tokens in the index that alters the total market value of the index while holding token prices constant will require a divisor adjustment.

$$Divisor_{new} = Divisor_{old} * \frac{\sum_{i=1}^n p_i * q_i * cf_i * fx_i \pm \Delta MC}{\sum_{i=1}^n p_i * q_i * cf_i * fx_i}$$

$\Delta MC$  = Difference between closing and adjusted closing market capitalization of the index.

## 5 CALCULATION

### 5.4 Data Correction and Disruptions

MarketVector Indexes will usually receive information about errors or disruption from calculation agent, index owner, client, internal systems (IT) or by monitoring the respective output.

Incorrect or missing input data will be corrected immediately:

- The error is immediately communicated to the calculation agent, if applicable.
- Calculation agent will be asked to investigate the reason for the error.
- An email will be sent to all affected clients to inform them about the error; this includes the reason for the issue and an estimate on when the issue will be solved.
- MarketVector Indexes recalculates missing EOD data points and disseminates to vendors and clients.

In case of a material error,

- Legal and Compliance to check the relevant agreements for liability of the calculation agent.
- If MarketVector Indexes identifies any conduct that may involve manipulation or attempted manipulation of an index by calculation agent it will report this to the regulator.
- Where possible and economically reasonable MarketVector Indexes will try use another calculation agent.

Investigations and communication regarding disruptions with calculation agents will be handled by Compliance and Senior Management. They are either caused by disruptions in calculation or dissemination, which might affect different servicers.

- The disruption is immediately communicated to the calculation/dissemination agent, if applicable.
- Calculation/dissemination agent will be asked to investigate the reason for the disruption.
- An email will be sent to all affected clients to inform them about the disruption; this includes the reason for the issue and an estimate on when the issue will be solved.
- MarketVector Indexes prompts calculation agent to make all efforts to restart index calculation.
- MarketVector Indexes prompts dissemination agent to make all efforts to restart index dissemination.
- MarketVector Indexes recalculates missing EOD data points and disseminates to vendors and clients.
- Legal and Compliance to check the relevant agreements for liability of the calculation/dissemination agent.
- If MarketVector Indexes identifies any conduct that may involve manipulation or attempted manipulation of an index by calculation/dissemination agent it will report this to BaFin.
- Where possible and economically reasonable MarketVector Indexes will try use another calculation and/or dissemination agent.

## 6 APPENDIX

### 6 Appendix

#### 6.1 Changes to the Index Guide

| Date | IG Version | Change |
|------|------------|--------|
|------|------------|--------|

## 7 Disclaimer

MarketVector Indexes™ has contracted with CryptoCompare Data Limited to maintain and calculate the Index. CryptoCompare Data Limited uses its best efforts to ensure that the Index is calculated correctly subject to the accuracy of any data that has been provided to it by third parties. Irrespective of its obligations towards MarketVector Indexes GmbH, CryptoCompare Data Limited has no obligation to point out errors in the Index to third parties. In particular, MarketVector Indexes™ is not responsible for the Licensee and/or for Licensee's legality or suitability and/or for Licensee's business offerings. Offerings by Licensee are not sponsored, endorsed, sold, or promoted by MarketVector Indexes™, Van Eck Associates Corporation as its parent company or its affiliates (collectively, "VanEck"), and MarketVector Indexes™ and VanEck make no representation regarding the advisability of investing in Licensee and/or in Licensee's business offerings. MARKETVECTOR INDEXES™, VanEck AND ITS AFFILIATES MAKE NO WARRANTIES AND BEAR NO LIABILITY WITH RESPECT TO LICENSEE.