



Index Methodology Guidebook

The Arch Indices VOI Core Absolute Income Index

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www.archindices.com



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Log of Amendments

1. **15.09.2023** – v.1.0. First publication of methodology guide.

Introduction and Background

ABOUT THE INDEX

Arch Indices VOI Core Absolute Income Index (the “Index”) aims to generate income while reducing portfolio volatility and achieve superior volatility-adjusted income performance. The index is composed of equity securities and fixed income ETFs. The index limits concentration risk through an issuer diversification approach. This index takes an approach to portfolio construction and volatility minimization through the Arch Indices Variance Optimized Indexing (“VOI”) optimization approach. The index begins with selection of equity securities and fixed income ETFs from an available universe that is defined below. Once securities are selected, the volatility is calculated based on 12 months realized. The correlation coefficient of each security relative to every other security is calculated based on 12 months realized. The VOI calculation engine then takes each security and weights it to maximize the overall portfolio yield while minimizing the expected volatility through each security’s realized volatility and its realized correlation coefficient relative to the overall portfolio. To reduce transaction cost and turnover, the index avoids trivial weightings. The index yield goal is an absolute yield goal.

ABOUT BITA

BITA is a Germany-based Fintech company that provides enterprise-grade indexes, data and infrastructure to institutions operating in the passive and quantitative investment spaces. Thanks to its innovative index management infrastructure, designed to outperform other existing solutions in terms of flexibility and speed, BITA can provide independent, methodologically sound indexes that are both investable and replicable by customers and stakeholders. BITA’s methodologies and processes are completely transparent and available publicly.


ABOUT ARCH INDICES

Arch Indices was founded with the mission to empower all investors to achieve their financial goals through the next generation of dynamic index solutions. The firm is the creator of Variance Optimized Indexing (VOI), a proprietary methodology designed to optimize the weightings of assets in a portfolio. VOI weights assets to maximize the portfolio goal while minimizing volatility by taking into account three factors: 1) the goal to maximize; 2) asset volatility; and 3) asset correlation to the rest of the portfolio. Arch Indices uses VOI to construct model portfolios and custom index solutions. To learn more, please visit www.archindices.com.

ABOUT THIS DOCUMENT

This document is published to serve as a guidebook of the methodologies adopted in the construction, calculation, and management of the index.

Any methodological changes or alterations to this document are performed by the Arch Indices Corp Index Committee specified on section 2 of the Index Governance and Miscellaneous section. The index is owned and administered by Arch Indices and calculated by BITA GmbH on its limited role as calculation agent.



There is no obligation for BITA to advise third parties and/or financial intermediaries, of any errors or omissions in the Index. The publication of the Index by BITA does not constitute a recommendation for capital investment and does not contain any assurance or opinion of BITA regarding a possible investment in a financial instrument based on this Index.

Index Characteristics and Specifications

1. GENERAL INFORMATION AND INDEX OBJECTIVES

The Arch Indices VOI Core Absolute Income Index aims to generate income while reducing portfolio volatility and achieve superior volatility-adjusted income performance. The index is composed of equity securities and fixed income ETFs. This index takes an approach to portfolio construction and volatility minimization through the Arch Indices Variance Optimized Indexing (“VOI”) optimization approach.

- **Inception Date:** 25.09.2023
- **Index value at inception:** 100
- **Return Calculation:** Price Return
- **Weighting Mechanism:** Custom
- **Rebalancing Frequency:** Quarterly
- **Reconstitution:** Quarterly
- **Number of Constituents:** Variable

The base currency of the index is USD. Index values may also be published in other currencies when applicable.

2. SHORT NAME AND IDENTIFIERS

The index is distributed under the following identifiers:

Name	Asset Class	FIGI	Ticker
The Arch Indices VOI Core Absolute Income	Equity	None	VOIWI

3. INDEX CALCULATION AND DISSEMINATION FREQUENCY

3.1. Calculation Methodology

The index is based on the Laspeyres formula, which links each successive weighted basket of securities in the index with the preceding basket. This translates into a unique index “Divisor” for each index, which is adjusted to maintain the continuity of the index’s values across changes due to corporate actions.

3.2. Calculation Frequency

The official index closing level is calculated once a day, every Business Day (EOD calculation). Historical “EOD” index data is available as backtested data starting on the index backtesting date, and as calculated and maintained data starting on the index inception date.

3.3. Index Dissemination

Official index EOD levels are calculated and disseminated after the close of all exchanges on which the index constituents are listed (EOD calculation). A day is considered to be a Business Day if at least one of the exchanges considered in the Index is open for trading.

The index is distributed via BITA's direct dissemination channels and a variety of data vendors when applicable.

Index Methodology

1. UNIVERSE CONSTRUCTION

The eligible universe of equity securities is defined using the following characteristics of all US-listed securities, including ADRs but excludes partnerships. The eligible universe will update quarterly on the rebalance calculation date.

A. Minimum market capitalization requirement: Securities must have a minimum market capitalization of 2 billion USD.

B. Minimum liquidity: 3-month ADTV must be equal to or greater than 0.2 million USD.

C. Minimum history of regular Dividends requirements: Minimum history of regular dividends of 5 years (special and irregular dividends are excluded).

D. Minimum trailing yield requirement: Minimum trailing yield of 3% (absolute yield).

The eligible universe of fixed income ETFs must meet the following conditions:

A. At least 50 percent of the value of its total assets is represented by:

(i) cash and cash items (including receivables), Government securities and securities of other regulated investment companies,

(ii) other securities for purposes of this calculation limited, except and to the extent provided by Arch Indices Corp, in respect of any one issuer to an amount not greater in value than 5 percent of the value of the total assets of the taxpayer and to not more than 10 percent of the outstanding voting securities of such issuer.

B. Not more than 25 percent of the value of its total assets is invested in:

(i) the securities (other than Government securities or the securities of other regulated investment companies) of any one issuer,

(ii) the securities (other than the securities of other regulated investment companies) of two or more issuers which the taxpayer controls and which are determined, under regulations prescribed by the Secretary, to be engaged in the same or similar trades or businesses or related trades or businesses,

(iii) the securities of one or more qualified publicly traded partnerships.

The list of eligible fixed income ETFs are showed in the table below:

Ticker	Name
BND	Vanguard Total Bond Market ETF
BNDX	Vanguard Total International Bond ETF
VICT	Vanguard Intermediate-Term Corporate Bond ETF
VTEB	Vanguard Tax-Exempt Bond ETF
VMBS	Vanguard Mortgage-Backed Securities ETF
VTIP	Vanguard Short-Term Inflation-Protected Securities ETF
BIV	Vanguard Intermediate-Term Bond ETF
VGIT	Vanguard Intermediate-Term Treasury ETF
VGLT	Vanguard Long-Term Treasury ETF
BLV	Vanguard Long-Term Bond ETF

USHY	iShares Broad USD High Yield Corporate Bond ETF
JAAA	Janus Henderson AAA CLO ETF

2. INDEX CONSTITUENT SELECTION

2.1. Index Ranking

All securities that enter the eligible universe are selected as constituents.

2.2 Security Considerations

Ordinary shares, preferred shares and ADRs are admitted in the Index.

All share classes of a company are admitted, as long as they qualify for membership on a stand-alone basis. If a company has more than one share class in the index, it will be considered as one company for composition considerations.

3. INDEX WEIGHTING

Once securities are selected, the volatility is calculated based on 12 months realized. The correlation coefficient of each security relative to every other security is calculated based on 12 months realized. The calculation engine then takes each security and weights it to maximize the overall portfolio yield while minimizing the expected volatility through each security's realized volatility and its realized correlation coefficient relative to the overall portfolio. To reduce transaction costs and turnover, the index avoids trivial weightings. The index yield goal is an absolute yield goal.

4. INDEX CAPPING AND FLOOR

4.1 Capping

No capping applied.

4.2 Floor

To reduce small positions, a minimum weighting of 0.10% is applied. When the minimum weighting is applied, the rest of the positions are scaled to 100%.

5. INDEX REVIEW SCHEDULE

5.1. Ordinary Adjustments

Rebalance of the index occurs on the 1st Thursday of every quarter at the equity market close. The index will rebalance be effective on the 2nd Thursday of every quarter at the equity market close. If Thursday is a holiday, the following business day will be used. The months of rebalance are February, May, August, and November.

BITA provides constituent pro-forma files each time the Index rebalances. Pro-forma files are normally released daily, covering the period between the Determination and Effective dates (proforma period).

Deletion Replacement rules: None.

5.2. Extraordinary Adjustments

BIMB may decide to substitute an index constituent or perform an extraordinary adjustment to the index upon the occurrence of an extraordinary event as deemed by BIMB or according to the “BITA Corporate Actions Treatment Guide”. In such cases, BITA will announce the index adjustment with a notice period of at least 2 trading days (with respect to the affected constituent) on BITA’s website and proceed to its implementation after the close of business on the effective date as specified in the aforementioned announcement.

Index Calculation

1. INDEX FORMULA

The index value is calculated at the end of each business day with the updated price from its constituents using the following formula:

$$Index\ Value_t = \sum_i^m \frac{P_{i,t} * IWF_{i,t} * TOS_{i,t} * AWF_{i,t} * F_{i,t}}{D_t}$$

Where:

P_{i,t}= Price of the constituent ‘i’ at time ‘t’

IWF_{i,t}= Investable Weighting Factor of constituent ‘i’ at time ‘t’

TOS_{i,t}= Total no. of Shares Outstanding of constituent ‘i’ at time ‘t’

AWF_{i,t}= Adjustable Weighting Factor for constituent ‘i’ at time ‘t’

F_{i,t}= Foreign exchange Rate for constituent ‘i’ at time ‘t’

D_t= Divisor Value at time ‘t’

The initial divisor (at inception **t = t₀**) value is calculated according to the following formula:

$$D_{t_0} = \frac{\sum_i^m (P_{i,t_0} * IWF_{i,t_0} * TOS_{i,t_0} * AWF_{i,t_0} * F_{i,t_0})}{Initial\ Index\ Value}$$

On each Adjustment Day t, the divisor is adjusted to keep the index value constant. The new divisor is calculated as:

$$D_{t+1} = D_t + \frac{Change\ in\ Market\ Cap\ of\ the\ Index}{Index\ Value_t}$$

The new divisor is then used in the calculation of the following day’s index open.

2. COMPUTATIONAL ACCURACY

The index will be calculated to 13 decimal figures.

Index values will be rounded to 2 decimal places for dissemination.

3. INDEX DIVISOR ADJUSTMENTS

The market capitalization of the index is affected by numerous events other than daily security price changes. At the company level, market capitalizations are affected by share changes caused by

corporate actions such as takeovers, acquisitions, and spin-offs. Changes also result from company additions and deletions to the index.

In order to insulate the members of the index from the effects of index constituent changes and corporate actions, the index's market capitalization is divided by an adjustment factor called the index divisor. During the trading day, the index is computed by dividing the index's current market capitalization by the divisor value. If there are no corporate actions or constituent changes, the divisor remains unchanged for the next trading day. If there is an event resulting in a capitalization change, the index's new adjusted base market cap is calculated after the close using the adjusted prices and adjusted share figures. Then, a new divisor is calculated for use at the opening on the next trading day. The new divisor links the closing index value to the new adjusted base market capitalization of the index.

4. DIVIDENDS AND OTHER DISTRIBUTIONS

For the purposes of the index adjustment, BITA distinguishes between Cash dividends and Special dividends. Cash dividends are treated differently depending on the type of Index.

In a Price Return Index, regular Cash dividends are neglected and only the Special dividends are considered.

In a Gross Total Return Index, reinvestments of Cash and Special dividend distributions are considered without performing deductions due to withholding taxes.

In a Net Total Return Index, reinvestments of Cash and Special dividend distributions are considered after deducting the withholding tax.

Dividend payments and other distributions will lead to a change in the value of the divisor. The new Divisor is calculated as follows:

$$D_{t+1} = \frac{\text{Index Market Cap Open}_{t+1}}{\text{Index Value at Close}_t}$$

For detailed information on dividends treatment, please refer to the "[BITA's Corporate Action Treatment Guide](#)".

5. CORPORATE ACTIONS AND OTHER ADJUSTMENTS

All corporate actions and events will be monitored and processed as per the rules and methodologies explicit in "[BITA's Corporate Action Treatment Guide](#)".

Shares outstanding for constituents change regularly due to a variety of events and corporate actions. Share changes of less than 10% are implemented at the Ordinary Index Reviews.

If the number of outstanding shares for an index constituent change by more than 10% due to a corporate action, such as those listed in BITA's Corporate Actions Treatment Guide, the company's share outstanding will be updated after the close of trading on the day prior to the ex-date of the corporate action.

In case of constituents from different countries and/or regions, it is possible that a business day in one country would be a public holiday in the other. In all such cases, the business day is considered valid and the index is calculated and disseminated just like in the normal index days. For the constituents that have a public holiday (i.e. no price movement) on index business day, the real-time forex rate is the only factor contributing to changes in the value of such constituents. In case that the public holiday is in the base currency of the index, then the constituent's prices are kept constant throughout the day.

6. CORRECTION AND RECALCULATION

As per BITA's Index Correction and Recalculation Policy, processes are in place to reduce error likelihood, ensure timeliness of identification, avoid subjectivity of corrective decisions and mitigate impact to clients.

While every effort is taken to ensure the accuracy of the index inputs, information and calculation, there is no guarantee that the index will be error-proof. Errors may occur due to data input errors, technology errors, application errors or other reasons.

For detailed information on specific errors, implementation timing and correction processes, please refer to the "[BITA Correction and Recalculation Policy](#)".

7. MARKET DISRUPTION

In periods of market stress, that might result in inaccurate market prices, delayed data inputs, illiquid constituents or fragmented markets, BITA calculates the Index following predetermined procedures as set out in its "[BITA Index Termination and Business Continuity Policy](#)", available at BITA's website.

Index Governance and Miscellaneous

1. METHODOLOGY ADJUSTMENTS AND REVIEWS

The Index Methodology is reviewed on a quarterly basis by Arch Indices Corp Index Committee, to make sure the Index continues to reflect the economic realities of the market and is not based on obsolete inputs or assumptions.

In case an adjustment to the Methodology is required, a detailed written policy outlines the steps and approvals required to develop, document, and approve the Index and its Methodology.

2. INDEX GOVERNANCE BODIES

The Product Development Group is comprised of investment professionals and/or industry experts and must abide by Arch Indices Corp Policy. Arch Indices Corp is responsible for decisions regarding the index composition as well as any changes to the rulebooks and methodology guides.

3. TERMINOLOGY

Adjustable Weighting Factor (AWF) is the adjustment factor introduced in the index calculation formula so that the index constituent weight capping factor is satisfied. No AWF changes occur due to corporate actions between rebalancing.

The *AWF* for each constituent on the determination date is calculated as:

$$AWF = \frac{CW}{W}$$

Where *CW* is the Capped Weight of that index constituent calculated on the determination date, and *W* is the uncapped weight (based on the free-float market capitalization) of that index constituent calculated on the determination date.

Adjustment Day is the day in which adjustments to the index divisor are performed. This could be days where reconstitution and rebalancing happen, or alternatively days before the ex-date of a corporate action.

Average Daily Traded Value of a stock is the sum of the Daily Traded Value over a specified period divided by the number of trading days over that specified period.

Business Day is a day on which an exchange is open for the buying and selling of securities, generally occurring on weekdays between normal business hours.

Capping Factor is the factor that limits the weight of any index constituent to a maximum pre-defined limit.

Coordinated Universal Time (UTC) is the primary time standard by which the world regulates clocks and time.

Daily Traded Value of a stock is the product of the closing price of that stock and the number of shares traded on the exchange on that business day.

Determination Date is the date (at end of day) used as a reference for the determination of index constituents, as well as index shares and parameters, which are to be applied at rebalancing/reconstitution.

End of Day (EoD) Index Values are the official index close levels calculated and stored, using official exchange close prices, at the end of each business day.

ET time: Eastern Time is five hours behind the Coordinated Universal Time standard, written as an offset of UTC - 5:00. That means to find the standard time in the zone one must subtract five hours from Coordinated Universal Time. During the daylight-saving adjustment period (March-October), the difference is four hours.

CET time: Central European Time is one hour ahead of the Coordinated Universal Time standard, written as an offset of UTC + 1:00. That means to find the standard time in the zone one must add one

hour to Coordinated Universal Time. During the daylight-saving adjustment period (March-October), the difference is two hours.

Extraordinary events are extreme market events that make index adjustments necessary. These events include:

- Merger
- Takeover bid
- Delisting
- Insolvency

For an exhaustive list, please refer to [BITA Equity Corporate Actions Treatment Guide](#).

Gross Total Return Index is obtained by reinvesting in the ordinary gross dividends declared by the index constituents, and assumes that any cash distributions, such as dividends, are reinvested assuming zero tax rate applicability on such cash distributions.

Net Total Return Indexes is obtained by reinvesting in the index the ordinary net dividends (i.e less withholding taxes) declared by the index constituents, and assumes that any cash distributions, such as dividends, are reinvested with the corresponding tax rate applied on such cash distributions.

Price Return Indexes is obtained by tracking the plain prices of the index constituent instruments, unadjusted with the respect to any possible dividends or other cash payouts from the instruments.

Inception Date refers to the official start date of the index, with the index base value as close value.

Investable Weighting Factor (IWF) is the percentage of shares outstanding that are included in the index calculation. In the case of Float-Adjusted Market Cap Weighted Indexes, the total shares outstanding are adjusted so that they exclude from the index calculation all shares not freely available to investors.

BITA uses fundamental data from a variety of recognized data vendors to calculate the IWF for each of its index constituents.

The **IWF** is calculated as:


$$IWF = \frac{TOS - SCH}{TOS}$$

Where **TOS** is the total number of shares outstanding, **SCH** is the number of shares restricted to investors.

Free float factors are reviewed on a regular basis in line with the rebalancing/reconstitution schedule using the most recent available data.

Changes to the number of shares due to stock dividends, splits, rights issues etc. are implemented immediately and effective the next trading day.

In case of other corporate actions and events, if there is a change of more than 10% in the SOC, BITA will announce the update in SOC immediately and the adjustment comes into effect two trading days



after the announcement. All other applicable changes are announced on the next underlying data announcement date, implemented on the index review date and effective the next trading day after implementation.

Market Capitalization is calculated as the product of the number of shares outstanding of the share class and the share price.

The index **Divisor** is an arbitrary number that is first defined when an index is first published. Its initial use is to divide the total value of the index to produce an index value that is easy to handle. Subsequently, the index divisor remains constant and requires adjustments, either when rebalancing and reconstituting or through corporate action treatments.

Pro-forma Files distributed to Index subscribers during the Pro-forma Period (i.e. the period between the determination date and the effective date of the upcoming rebalancing/reconstitution) contain the preliminary index weights, index shares and other relevant parameters for the upcoming rebalancing/reconstitution. While the index shares remain constant (unless affected by corporate actions) during the Pro-forma Period, the index weights will move along with the market.

Total Number of Shares Outstanding (TOS) of an index constituent on any given business day refers to a company's stock currently held by all its shareholders, including share blocks held by institutional investors and restricted shares owned by the company's officers and insiders.

4. BITA DISCLAIMER

All information is provided for information purposes only. All information and data contained in this publication, and provided by BITA, are obtained by BITA from sources believed by it to be accurate and reliable. Because of the possibility of human and mechanical error as well as other factors such information and data are provided “as is” without warranty of any kind.

The publication of the Index by BITA does not constitute a recommendation for capital investment and does not contain any assurance or opinion of BITA regarding a possible investment in a financial instrument based on this Index.

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5. ARCH INDICES DISCLAIMER

The Index Administrator (Arch Indices Corp) does not offer any explicit or tacit guarantee or assurance, neither pertaining to the results from the use of the index nor the level of the index at any certain point in time. Customers should consider obtaining independent advice before making any financial decision.

Arch Indices Corp does not make any claim, prediction, warranty or representation whatsoever, expressly or impliedly, either as to the accuracy, timeliness, completeness, merchantability of any information or results to be obtained from the use of the Index.

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For information regarding the index methodology or concepts:

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