Index Maintenance Policy

I. Index Maintenance

In addition to the scheduled reviews, indexes are reviewed on an ongoing basis. Changes in index composition and related weight adjustments are necessary whenever there are extraordinary events such as liquidations, conversions, delistings, bankruptcies, mergers or takeovers involving index components. In these cases, each event will be addressed on its effective date. Whenever possible, these changes in the index's components will be announced at least two business days prior to their implementation date.

1. Changes in Eligibility

If a component no longer meets the index's eligibility requirements it will be removed from the index on the effective date of the next rebalancing.

2. Mergers/Takeovers

(Securities removed due to M&A activity after trading has ceased will be removed at the acquisition price for cash transactions and a derived acquisition price for stock or cash and stock transactions. Otherwise, the security will be removed at the last traded price as of market close the day prior to removal.)

2.1 Between component stocks

Merger Approach 1.0: If an index constituent merges or is taken over by a component stock, its index weight will be transferred to the surviving stock.

Merger Approach 2.0:
If an index constituent merges or is taken over by a component stock, its index weight will be removed from the index, and the weight will be redistributed proportionally to the remaining index constituents.

Merger Approach 3.0: If an index constituent merges or is taken over by a component stock, the action taken is dependent on the deal terms:

All Cash - its index weight will be redistributed proportionally to the remaining index constituents.
All Stock - Its index weight will be transferred to the surviving stock.
Cash and Stock – The percentage of weight represented by the stock portion will be transferred to the surviving stock's weight and the percentage represented by the cash portion will be redistributed proportionally to the remaining index constituents.

Approach 1.0 is the default merger approach for market cap weighted indexes and Approach 2.0 is the default approach for non-market cap weighted indexes. Indexes adopting Approach 3.0 are listed in the Appendix.

2.2 By non-component stocks

If an index constituent merges or is taken over by a non-component stock, its index weight will be removed from the index, and the weight will be redistributed proportionally to the remaining index constituents.

3. Spin-Offs

3.1 Market Cap weighted indexes

In the event of a spin-off, the price of the parent company will be adjusted downward based on the value of the spin-off. The parent company shall remain in the index, the spun-off company shall be dropped from the index and the weight of the spun-off company shall be redistributed proportionately to the remaining index constituents.

If the value of the spin-off cannot be determined the day prior to the ex-date then the spin-off will be added to the index based on the terms with a value of zero. The spin-off will then be removed from the index after two days of trading.

3.2 Non-Market Cap weighted indexes

In the event of a spin-off, the price of the parent company will be adjusted downward based on the value of the spin-off. The index shares of the parent company will be adjusted upward to offset the price adjustment so that the weight is not changed as a result of the action.

If the value of the spin-off cannot be determined the day prior to the ex-date then the spin-off will be added to the index based on the terms with a value of zero. The spin-off will then be removed from the index after two days of trading and its weight will be transferred to the parent company.

4. Share Offerings, Tenders, and Share Buy-Backs

All Share Offerings, Tenders. and Buybacks that result in an increase or decrease of a constituent stock’s shares outstanding will be implemented at the rebalancing.

5. Rights Offerings

5.1 Market Cap weighted indexes

Rights Offerings will be exercised, provided the subscription price is less than the closing price the day prior to the ex-date (in-the-money). The price of the security will be adjusted downward based on the value of the rights. The index shares will be adjusted upwards based on the full terms of the offering. The costs associated with exercising the rights will be derived proportionately from the remaining constituents in the index.

5.2 Non-Market Cap weighted indexes

Rights Offerings will be exercised, provided the subscription price is less than the closing price the day prior to the ex-date (in-the-money). The price of the security will be adjusted downward based on the value of the rights. The index shares will be adjusted upwards to offset the price decrease so that the weight is not changed as a result of the action.

6. Stock Splits and Stock Dividends

Stock splits and stock dividends result in the index shares increasing and the security price decreasing by a proportionate amount based on the terms of the action. The security's weight is not changed as a result of the action.

7. Reverse Stock Splits

   Reverse stock splits result in the index shares decreasing and the security price increasing by a proportionate amount based on the terms of the action. The security's weight is not changed as a result of the action.

8. Treatment of Distributions in midstream and MLP indexes
   Cash distributions and dividends from all constituents are applied on the ex-date to total return index variants. No adjustments are implemented to the price return indexes.

9. Regular Cash Dividends
   Regular dividends are applied on the ex-date to the total return and net total return variants. No adjustments are implemented to the price return index.

10. Dividend Adjustments for Japanese and Korean Dividends that are finalized post ex-date are covered in the VettaFi Japanese and Korean Dividend Adjustment Methodology.

11. Special Cash Dividend

11.1 Market Cap weighted indexes

A special dividend will result in the price of the security being adjusted downward by the dividend amount. The proceeds of the dividend will be redistributed proportionally to the remaining index constituents. A special dividend will be applied to the price return index in addition to the total return and net total return variants.

11.2 Non-Market Cap weighted indexes

A special dividend will result in the price of the security being adjusted downward by the dividend amount. The proceeds of the dividend will be reinvested into the paying company by adjusting the index shares upward so that the weight is not changed as a result of the action. A special dividend will be applied to the price return index in addition to the total return and net total return variants.

12. Removal of Stocks Due to Delisting, Bankruptcy or Extreme Financial Distress

12.1 If an index constituent is de-listed from all eligible exchanges, it will be removed from the index and its weight will be reallocated.

12.2 If an index constituent enters bankruptcy proceedings, it will be removed from the index and will remain ineligible for re-inclusion until it has emerged from bankruptcy. However, the Committee may, following a review of the bankrupt company and the issues involved in the filing, decide to keep the stock in the index.

12.3 Expert judgement may be used to remove a stock determined to be in extreme financial distress if its removal is deemed necessary to protect the integrity of the index and the interests of investors in products linked to the Index.

13. Pricing of Stocks in Extreme Financial Distress

13.1 When a stock is suspended from trading due to financial distress and subsequently de-listed by its primary market prior to resumption of trading, the Calculation Agent will use the best-available alternate pricing source to determine the value at which the stock should be removed from the index.

13.2 If the stock's primary market price is no longer available due to its suspension or de-listing, a current price from another exchange, such as a regional or electronic marketplace, may be used. In the absence of those prices in the case of U.S. securities, OTC Bulletin Board, OTC Equity (non-OTCBB stocks), and Pink Sheet traded prices could be applied in that order.

13.3 If neither a traded price nor a bid/asked range is available, the Committee will evaluate the status of the suspended stock. The Committee may consult with managers of portfolios linked to indexes in which the stock is a constituent in determining the value of the stock. It will use its expert judgement to value the stock. If the Committee concludes that the security has become worthless or is likely to remain too illiquid to be traded, it will be removed from the Indexes at .01 local currency of the stock.

II. Index Calculations

1. Index Formula

The index is calculated using a Laspeyres formula. This formula is used for the calculation of the return index and the price index. The only difference is that the divisor Dt is different for the two indexes (return index and price index).

The index is computed as follows:

$$Index_t = \frac{\sum_{i=1}^{n}(p_{it} * q_{it})}{(C_t \sum_{i=1}^{n}(p_{iO} * q_{iO}))} * Base\ Index\ Value = \frac{M_t}{B_t} * Base\ Index\ Value$$

The above-mentioned formula can be simplified as: $\text{Index}_t = \frac{M_t}{D_t}$

Where:

D_t	=	B_t/base index value = divisor at time (*t*)
n	=	the number of stocks in the index
p_{i0}	=	the closing price of stock *i* at the base date
q_{i0}	=	the number of shares of stock i at the base date
p_{it}	=	the price of stock *i* at time (*t*)
q_{it}	=	the number of shares of stock *i* at time (*t*)
C_t	=	the adjustment factor for the base date market capitalization
t	=	the time the index is computed
M_t	=	market capitalization of the index at time (*t*)
B_t	=	adjusted base date market capitalization of the index at time (*t*)

Dividend payments are not included in the price indexes, whereas dividend payments are reinvested in the index constituents of the total return index on a proportional basis.

2. Divisor Adjustments

Changes in the index's market capitalization due to changes in the composition (additions, deletions, or replacements), weighting (following quarterly reviews, corporate actions (mergers, or special cash or stock distributions of other stocks) result in a divisor change to maintain the index's continuity. By adjusting the divisor, the index value retains its continuity before and after the event.

For rights offerings, the Calculation Agent will price the rights during the subscription period, not before or after. Alternatively, the Calculation Agent may start pricing the rights after the ex-date and before the subscription period, under the condition that the rights are priced daily.

Formulae for Divisor Adjustment. The following formulae will be used for divisor adjustments. (Note: No divisor adjustments are necessary for stock splits, since market capitalization does not change, and the share number and share price are adjusted prior to the opening of trading on the split's ex-date.)

$$D_{t+1} = D_t * (\frac{\sum(p_{it} * q_{it}) \mp \Delta MC_{t+1}}{\sum(p_{it} * q_{it})})$$

Where:

D_t	=	divisor at time (*t*)

D_{t+1}	=	divisor at time (*t+1*)
p_{it}	=	stock price of stock *i* at time (*t*)
q_{it}	=	the number of shares of stock *i* at time (*t*)
ΔMC_{t+1}	=	add new components' market capitalization and adjusted market capitalization (calculated with adjusted closing prices and shares effective at time *t+1* and/or minus market capitalization of stocks to be deleted (calculated with closing prices and shares at time *t*)

Note: If the current trading price of an issue is unavailable, the previous trading session's closing price is used. However, if the issue is affected by any corporate action that requires an adjustment, then the adjusted price is used.

Computes index values are rounded to twelve decimal places but are generally published, based on the standards of the publisher, with greater rounding.

3. Liquidity Calculations

R-Score = 90-day ADTV (thousands USD) / Float Market Capitalization (millions USD)

4. Currency Hedging Calculations

The Hedged Index Formula tracks a portfolio of monthly FX Forwards of each currency represented in the index against the home currency of the hedged index in proportion to the currency weights represented in the Unhedged Index as of the adjusted close of the day before the FX Forward rebalancing date[1]. If the FX Forward Rebalance Date corresponds with an Index Rebalance Date, the pro-forma weights are used. The weights of each currency are kept constant throughout the month regardless of changes and/or corporate actions of the underlying unhedged index.

$$HIL_t = HIL_{reb} * \frac{UI_t}{UI_{reb}} + HIL_{reb-1} * HI_t$$

Where:
HIL_t = Hedged Index Level
UI_t = Unhedged Index Level in same home currency as Hedged Index Level
reb = Previous Forward rebalancing day.
HI_t = Hedge Impact

$$HI_t = \frac{\sum_{i=1}^{n} Mktcap_{i,reb-1} * CHI_{i,t}}{\sum_{i=1}^{n} Mktcap_{i,reb-1}}$$

Where:
$Mktcap_{i,reb-1}$ = Total Market Cap for equities denominated in currency i as of the adjusted close of the day before the previous rebalancing day.
$CHI_{i,t}$ = Currency Hedge Impact for currency i on business day t.

$$CHI_{i,t} = \frac{S_{i,reb-1}}{F_{i,reb}} - \frac{S_{i,reb-1}}{FV_{i,t}}$$

[1] Indexes can be configured to hedge monthly on the last business day of the month or to correspond to the rebalancing of the index, ie: 3rd Friday of the month.

Where:
$S_{i,reb-1}$ = Spot FX Rate for currency i against the home currency on the day before the previous rebalancing day.
$F_{i,reb}$ = 1M Forward FX Rate as of the previous rebalancing day.
$FV_{i,t}$ = The interpolated forward rate for currency i against the home currency on day t.

$$FV_{i,t} = S_{i,t} + \frac{(F_{i,t} - S_{i,t}) * n}{T}$$

Where:
$S_{i,t}$ = Spot FX Rate for currency i against the home currency on the day t
$F_{i,t}$ = 1M Forward FX Rate for currency i against the home currency on the day t
n = number of calendar days left before the next forward rebalancing day.
T = number of days between the Spot settlement date and the maturity date of a 1M Forward contract on day t.

5. Multi-Constraint Capped Weight Smoothing Process:

VettaFi employs a tailored process to address a common multi-factor concentration constraint. For example, the aggregate weight of constituents with weights greater than 5% should not exceed 45%. The smoothing process is designed to maintain the higher weights of the constituents with higher caps while reducing their weights in a proportionate manner.

The process segments weights into overweight, static, and underweight ranges. These ranges help maintain the original large/small cap ranges.

The smoothing process identifies three sets of constituents:

Overweight: Constituents that contribute to excess concentration. (e.g. Constituents that weigh over 5% and have a combined weight greater than 45%).

Static Weight: A fixed weight segment is defined between the overweight and underweight segments whose member, if any, weights are not adjusted. The highest weight within this segment serves as the floor for constituent weights within the Overweight segment and the lowest weight within this segment serves as the ceiling for the Underweight segment. A default floor or ceiling is assigned in the absence of constituents within the Static weight segment that can serve as a floor or ceiling.

Underweight: Constituents with weights below the Static Weight segment whose constituents proportionately receive the excess weight removed by the smoothing of the Overweight segment.
Constituent weights in the overweight category are proportionally reduced by a small factor until the excess concentration is removed. Constituents in the overweight category are only reduced in weight until they reach the defined floor.

This process allows the securities with excess weight to stay in their natural range, adjusting them all in a proportional manner, and maintaining their higher allocation.

Excess weight removed from the overweight group is proportionally added to the Underweight group constituents while respecting the defined ceiling.

Example of multi-constraint smoothing:

		Aggregate Weights over 5%			
			Original	Smoothed	
		Target	45.00%	45.00%	
		Actual	52.68%	45.00%	
Overweight		Static Weight			Underweight	
Original	Smoothed		Original	Smoothed	Original	Smoothed
7.09%	6.70%	Floor	4.80%	4.80%	3.85%	4.15%
6.45%	6.10%	Ceiling	4.72%	4.72%	2.84%	3.06%
5.99%	5.66%				2.73%	2.94%
5.70%	5.39%				2.56%	2.75%
5.67%	5.36%				1.81%	1.95%
5.61%	5.30%				:	:
5.56%	5.26%				1.21%	1.30%
5.54%	5.24%				1.06%	1.15%
5.07%	4.80%				:	:
					0.14%	0.15%
					0.08%	0.09%

III. Adjustments for Corporate Actions

An index divisor may decrease (▼) or increase (▲) or keep constant (■) when corporate actions occur for a component stock. Assuming shareholders receive “B” new shares for every “A” share held for the following corporate actions:

1. ▼ CASH DIVIDEND (applied for return index only)
adjusted price = closing price - dividend announced by the stock

2. ▼ SPECIAL CASH DIVIDEND (applied for price and return index)
adjusted price = closing price - dividend announced by the stock

3. ▼ SPIN-OFF
adjusted price per share = closing price per share – spinoff value

4. ■ SPLIT AND REVERSE SPLIT
adjusted price = closing price * A / B
new number of shares = old number of shares * B / A

5. ▲ RIGHTS OFFERING
adjusted price = (closing price * A + subscription price * B) / (A + B)
new number of shares = old number of shares * (A + B) / A

6. ■ STOCK DIVIDEND
adjusted price = closing price * A / (A + B)

new number of shares = old number of shares * (A + B) / A

7. ▼ STOCK DIVIDEND OF A DIFFERENT STOCK SECURITY
adjusted price = (closing price * A - price of the different stock security * B)/A

8. ▲ COMBINATION STOCK DISTRIBUTION (DIVIDEND OR SPLIT) AND RIGHTS OFFERING
Shareholders receive B new shares from the distribution and C new shares from the rights offering for every A share held:

8.1 If rights are applicable after stock distribution (one action applicable to other).
adjusted price = [closing price * A + subscription price * C * (1 + B / A)] / [(A + B) * (1 + C / A)]
new number of shares = old number of shares * [(A + B) * (1 + C / A)] / A

8.2 If stock distribution is applicable after rights (one action applicable to other).
adjusted price = [closing price * A + subscription price * C] / [(A + C) * (1 + B / A)]
new number of shares = old number of shares * [(A + C) * (1 + B / A)]

9. ▲STOCK DISTRIBUTION AND RIGHTS (NEITHER ACTION IS APPLICABLE TO THE OTHER)
adjusted price = [closing price * A + subscription price * C] / [A + B + C]
new number of shares = old number of shares * [A + B + C]

IV. Input Data Sources [2]

1. Stock prices, derivative prices, and Closed End Fund prices are obtained from relevant major exchanges via leading market data providers. The most recent closing prices of constituent stocks are used for index calculation.

2. The number of shares is determined separately for each class of stock. This information is obtained from regulatory filings and a variety of data vendors. The data also may be sourced from the constituent stocks themselves.

3. Corporate actions are sourced from public news services, regulatory filings, and data vendors. The constituent stocks themselves may be used as an additional source.

4. Prices and rates used are based on arms lengths observable transactions. In the event a security is not priced, VettaFi will rely on a major independent data provider to supply valuation and disclose its data source. When alternative pricing is required due to liquidity, volatility, or other market conditions VettaFi will follow the process used for delisted stocks (See Pricing of Stocks in Extreme Financial Distress).

5. FX Rates –See FX pricing appendix for details.

V. Rebalance/Reconstitution

1. Data used to evaluate securities for inclusion are as the Snapshot or Record Date.
2. Index Shares are assigned based on prices at the Weight Date. Since index shares are assigned based on prices at the Weight Date, the weight of each constituent on the Rebalance/Reconstitution dates may differ from its target weight due to market movements between the two dates.
3. Indexes whose universe are based on other indexes and reconstitute at the same time will use pro-forma values when available.

[2] Schedule of third parties used in Index calculation and reconstitution are available upon request by emailing indexgovernance@vettafi.com.

VI. Calculation and Dissemination of Index Values

Index values are calculated based on closing prices as reported by the relevant exchanges.

The following index files are posted to VettaFi's FTP site for dissemination. Postings will generally be posted by 7:00 PM EST each day index files are created.

Closing Index File - Index constituents, closing prices, weights, share weights and related data as of the day's close.

Adjusted Closing Index File - Index constituents, closing prices, weights, share weights and related data as of the next trading day's open.

Corporate Action File - Data related to upcoming corporate actions for the Indexes' constituent stocks.

Index Values File — Closing values for the index return and currency variants, including divisors.

Reconstitution and Rebalance changes:
Pro-forma files are posted and distributed to clients via VettaFi's FTP site within 2 business days following US market closure on the respective weight dates.

Alerian indexes have changes emailed directly to clients on the morning of the 2nd Friday of the rebalance month.

Corporate action changes:
Changes are announced via Corporate Action file at least two business days prior to the effective date when possible.

VII. Data Correction Policy

To maintain a high standard of data integrity, a series of procedures have been implemented to ensure accuracy, timeliness, and consistency. Input prices are monitored using a variety of computerized range-check warning systems. Fault tolerant methods are employed in the collection of market and corporate action data. Various verification and audit tasks are performed to ensure the quality of the data feeds and related market data. While every effort is taken to ensure the accuracy of the information used for the index calculation, an index error may occur due to incorrect or missing data, including trading prices, exchange rates, shares outstanding and corporate actions, due to operational errors or other reasons. When corrections of EOD values are made, licensee's are notified within a day's time.

1. Intraday Corrections. Reasonable efforts are employed to prevent erroneous data from affecting the indexes. Corrections will be made for bad prices and incorrect or missing corporate actions as soon as possible after detection.

2. Index-Related Data and Divisor Corrections. Incorrect pricing and corporate action data for individual issues in the database will be corrected upon detection. In addition, an incorrect divisor of an index, if discovered within five days of its occurrence, will always be fixed on the day it is discovered to prevent an error from being carried forward.

3. If a divisor error is discovered more than five days after occurrence, the adjustment will depend upon how significant the error is, how far back the error occurred and the feasibility of performing the adjustment.

4. An error may not be corrected if it is assessed to be non-material to index stakeholders.

VIII. Index Construction Policies

1. Multiple Listings and Share Classes: In cases of multiple listings or share classes, that meet index requirements, the most liquid issue, measured by 3 Month ADTV, will be chosen. This issue will not be replaced unless it ceases to be the most liquid issue for 3 quarters. If there is a reconstitution at the 3rd quarter, it will be replaced by the most liquid issue. Otherwise, the most liquid issue will be selected at the next reconstitution.
2. 10,000 USD Share rule: If the most liquid constituent is part of a US benchmark, has a price of 10,000 USD or greater, and an alternative share class exists that can take the place of that share class, the lower priced alternative share class will be chosen.

3. Depository Receipt Inclusion – see appendix.

Contact Information

For any questions regarding an index, please contact: indexgovernance@vettafi.com

Disclaimer

Review:

Version	1.0.2
Reviewed by	Index Governance and Index Committee
Review Date	June 2023
Next Review	June 2024
Review Date	July 2024
Next Review	June 2025

Changes:

Version	Date	Author/Editor	Summary of Change
1.0.0	June 2023	Moshe Greenberg	Policy Creation
1.0.1	June 2023	Moshe Greenberg	Minor Edits
1.0.2	June 2023	Moshe Greenberg	Moved Expert Judgement to Index Policies document

1.03	July 2023	Moshe Greenberg	“Equal or fixed weighted” changed to “non-market cap weighted”
1.1.0	October 2023	Moshe Greenberg	Added Market Cap Weighted Index Merger Approach 2.0:and clarified prices used.
1.1.0	October 2023	Moshe Greenberg	Added Currency Hedge Calculations
1.1.1	November 2023	Moshe Greenberg	Added clarification on weight determination for rebalances and reconstitutions.
1.1.1	November 2023	Moshe Greenberg	Added Depository Receipt Inclusion Appendix
1.1.1	November 2023	Moshe Greenberg	Added Treatment of Distributions in midstream and MLP indexes
1.1.1	November 2023	Moshe Greenberg	Use of pro-forma constituents in universes detailed.
1.1.2	March 2024	Moshe Greenberg	Added Multi-Constraint Capped Weight Smoothing Process
1.1.2	March 2024	Moshe Greenberg	Added 10,000 USD Share rule for multiple share classes.
1.1.3	May 2024	Moshe Greenberg	Clarified data correction policy.
1.1.4	July 2024	Moshe Greenberg	Annual Review

FX Pricing Appendix

Unless otherwise specified, FX priced are as of 4 PM GMT pricing. The following table is a list of indexes with other pricing times:

Index	Base Ticker	Pricing Time
Alerian Midstream Energy Dividend Weighted Index	AEDW	4 PM EST
Alerian Midstream Energy Corporation Index	AMCC	4 PM EST
Alerian Midstream Energy Select Index	AMEI	4 PM EST
Alerian Midstream Energy Index	AMNA	4 PM EST
Alerian US Midstream Energy Index	AMUS	4 PM EST
Alerian MLP Index	AMZ	4 PM EST
Alerian MLP Equal Weight Index	AMZE	4 PM EST
Alerian MLP Infrastructure Index	AMZI	4 PM EST
S-Network Emerging Sector Dividend Dogs	EDOGX	4 PM EST
S-Network International Sector Dividend Dogs	IDOGX	4 PM EST
O'Shares Europe Quality Dividend Index	OEURX	4 PM EST
O'Shares Global Internet Giants	OGIGX	4 PM EST
O'Shares U.S. Quality Dividend Index	OUSAX	4 PM EST
O'Shares U.S. Small-Cap Quality Dividend Index	OUSMX	4 PM EST
S-Network Global Travel Index	TRAVEL	4 PM EST

Depository Receipt Inclusion Appendix

Unless specified, starting Mar 2024, depository Receipts will only be included in the following VettaFi country universes:

Universe	Effective Date
Argentina	1/1/2000
Brazil	1/1/2000
China	3/1/2016
Netherlands	1/1/2000
Peru	1/1/2000
Russia	1/1/2000
Singapore	1/1/2000
South Africa	1/1/2000
Thailand	1/1/2000

Appendix - Indexes not employing default merger approaches

Index or Family	Effective Date	Approach
VettaFi Developed World Equity Index Family	inception	3.0
VettaFi Canada Extended Market Index Family	inception	3.0
EQM Emerging Markets FinTech Index	05/01/2024	3.0
EQM Global Cannabis Index	05/01/2024	3.0
EQM Global Online Retail Growth Index	05/01/2024	3.0
EQM Global Solar Energy Index	05/01/2024	3.0
EQM Lithium & Battery Technology Index	05/01/2024	3.0
EQM Natural Resources Dividend Income Index	05/01/2024	3.0
EQM Online Retail Index	05/01/2024	3.0
XOUT U.S. Large Cap Index	05/01/2024	3.0
EQM Future of Defence Index	05/01/2024	3.0
EQM High Income Pass-Through Securities Index	05/01/2024	3.0
MUSQ Global Music Industry Index	05/01/2024	3.0
VettaFi Weight Loss Drug Index	inception	3.0