MVIS®
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INDEX GUIDE

MVIS® GLOBAL BOND INDICES

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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 Bond Index family (the "Indices").
MV Index Solutions GmbH (the "Index Owner") makes no warranties or representations as to the accuracy and/or completeness of the Indices and does not guarantee the results obtained by persons using the Indices in connection with trading funds or securities. The Index Owner makes no representations regarding the advisability of investing in any fund or security.
The Index Owner reserves the right to update the rules in this Index Guide at any time. The Index Owner also reserves the right to make, in exceptional cases or in temporary situations, exceptions to the rules in this Index Guide. The Indices are the property of MV Index Solutions GmbH. The Index Owner has selected an index calculator to calculate the Indices.
MVIS® is a registered trademark of Van Eck Associates Corporation and therefore protected globally against unlawful usage. The use of MVIS Indices in connection with any financial products or for benchmarking purposes requires a license. Please contact MV Index Solutions GmbH for more details.

1.1 Approval of Index Methodologies

The Index Owner has established the Indices 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 Owner'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 transparence of the underlying market for each methodology has been tested and particular circumstances for each relevant market have been taken 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 Owner for final approval.

1.2 Review of this Index Guide

According to Art. 13 No. 1 (b) of the Benchmark Regulation, the Index Owner 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 Owner. If changes to this Index Guide are considered necessary, the process described in Section 4.3 applies.

2 General Definitions

2.1 Liquidity

Constituents of the indices must be priced and have sufficient liquidity.
In analysing liquidity of securities for inclusion in the indices, the Index Owner utilizes analytics published by various data providers. Factors to be considered in analysing liquidity may include, but are not limited to, recent trading volume, number of trades, frequency of trades or trading activity of related securities.
If there is insufficient trading volume in a constituent or proposed security to obtain accurate pricing during the immediately preceding month, the security in question will be removed at the next monthly rebalancing.
Liquidity will be tested monthly and rebalancing will occur on each Monthly Rebalancing Date (except in the event of an Event Driven Rebalancing).

2.2 Coupon Payments

The total return gross indices (TR) include all coupon payments (on a gross basis). No tax is deducted.

2.3 Review Schedule

All Indices are rebalanced monthly (the "Monthly Rebalance Date").
The reviews for all indices are based on the (adjusted) closing data on the fifth but 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 after close of trading.

Indices are rebalanced after close of business of the last trading day in each month.

The Index Owner can, in exceptional cases, add securities to the index and also remove securities from the indices.

2.4 Dissemination

The end-of-day index values are calculated and disseminated at the end of each Trading Day.
The indices are disseminated on days when either the US bond market is open for trading or at least one of the index components of the index is available for trading.

2.5 Pricing Source

Bond prices are sourced from ICE Data Services, LLC.

2.6 Index Currency

The indices are calculated with the constituent prices converted to USD, if necessary. Dissemination is in USD.
Currency pricing is as of 4pm EST with fixed 16:00 GMT exchange rates from WM company (please see Reuters page WMRSPOT01 or Bloomberg pages WMCO).

3 Indices

The following sections define all relevant index parameters, this includes

- Universe: eligible securities,
- Review: selection and weightings,
- Dissemination: times, currencies and identifiers.

3 INDICES

3.1 MVIS® Emerging Markets Aggregate Bond Index

The MVIS EM Aggregate Bond Index is designed to track the performance of the Emerging Market sovereign bonds and corporate bonds denominated in USD, Euro or local emerging markets currencies (either the home currency of an emerging country (as defined below) or any other currency from an emerging country (as defined below)).
The index includes investment-grade and below investment-grade bonds in these four buckets:

- Sovereign bonds - either USD-denominated or EURO-denominated,
- Sovereign bonds - local-currency-denominated,
- Corporate bonds and quasi-sovereign bonds - either USD-denominated or EURO-denominated,
- Corporate bonds and quasi-sovereign bonds - local-currency-denominated.

Issuer Criteria

In order to be included in the index, the bonds must be issued by

- an emerging markets sovereign or quasi-sovereign issuer, or
- a corporate issuer whose primary "country of risk" is deemed to be an emerging market country.

Country Criteria

The "country of risk" is used as the identifier for a country of a bond. If the "country of risk" of a bond is classified as "supranational", then this bond is not eligible.
The criteria for a country to be deemed an emerging market country include but are not limited to:

- a country's GNI per capita and
- the World Bank and International Monetary Fund (IMF) country classifications, geography, and historical classification.

Emerging market countries are determined and reviewed on an on-going basis. As of September 2013, eligible countries include:

- Africa (15 countries): Angola, Côte d'Ivoire, Egypt, Gabon, Ghana, Kenya, Malawi, Morocco, Namibia, Nigeria, Senegal, South Africa, Tanzania, Tunisia, Zambia
- Americas (20 countries): Argentina, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guatemala, Honduras, Jamaica, Mexico, Panama, Paraguay, Peru, El Salvador, Uruguay, Venezuela
- Asia (16 countries): Bangladesh, China, Hong Kong, India, Indonesia, Iraq, Israel, Jordan, Lebanon, Malaysia, Mongolia, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam
- Eastern Europe (17 countries): Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Latvia, Lithuania, Poland, Romania, Russia, Serbia, Turkey, Ukraine
- Middle East (6 countries): Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates

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Instrument Types

Securities eligible for the index are amongst others: fixed-rate securities, fixed-to-floating rate securities qualify provided they are callable within the fixed rate period and are at least one year from the last call prior to the date the bond transitions from a fixed to a floating rate security, callable perpetual securities qualify provided they are at least one year from the first call date; dim sum bonds, sukuks, original issue zero coupon bonds, bonds with step-up coupons, dual-currency bonds, sinkable bonds and puttable bonds.
Securities not eligible for the index are for example: repackaged securities linked to a security, a basket of securities or an index, swaps, ETFs, preferred securities, convertible securities, certificates of deposit, notes with options or warrants attached, bearer bonds, floating rate bonds, extendible bonds, asset-backed or other structured securities, defaulted bonds and inflation linked bonds, GDNs (Global Depositary Notes). Bonds whose cash flow streams are uncertain, including but not limited to certain variable rate securities whose coupon rate can be reset one or more times by the issuer, whether or not those securities are putable at the time of the coupon reset. As a general principle, if the index provider believes that uncertainty of scheduled cash flows on certain bonds can lead to degradation of the robustness of calculations on those bonds, and therefore on the index, he may choose to exclude such bonds.
Bonds already included in the index must have a minimum of 12 months remaining to maturity. Bonds to be included must have a minimum of 24 months to maturity.
Local currency bonds that are subject to regulatory constraints, registration requirements, tax constraints, explicit capital controls that make it infeasible and/or uneconomical for foreign investors to purchase may not be eligible for the index. Bonds that are "domestically" issued from the following countries are excluded: Argentina, China and India.
The Index Owner can, in exceptional cases, include or exclude certain bonds or issuers to improve the quality of the index or the tradability.

Amount Outstanding

Bonds are included in the index if the amount outstanding is greater than or equal to

- sovereign bonds - either USD-denominated or EURO-denominated: 500 million USD,
- sovereign bonds - local-currency-denominated: 1,000 million USD,
- corporate bonds and quasi-sovereign bonds - either USD-denominated or EURO-denominated: 300 million USD,
- corporate bonds and quasi-sovereign bonds - local-currency-denominated: 300 million USD,

(based on amount outstanding and USD exchange rates of the monthly review dates).
Bonds already in the index must have amount outstanding that is greater than or equal to 900 million USD for local currency sovereign bonds, 450 million USD for sovereign external bonds and 270 million USD for all others.

Weighting Methodology

The index uses a modified market cap weighting methodology.

1. Weightings are capped at 3% per issuer of corporate bonds (either USD-denominated, EURO-denominated or local-currency denominated) on MVEMAG index level and the excess weight shall be redistributed proportionally across all other uncapped corporate bonds (either USD-denominated, EURO-denominated or local-currency denominated).

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2. Weightings per country (of risk) are capped at 10% within each of the buckets and the excess weight shall be redistributed proportionally across all other uncapped countries in the same bucket. Within each country, the excess weight is distributed proportionally across all other uncapped bonds (after step 1) within this country in this bucket.
3. Weightings are capped at 50% per bucket and the excess weight shall be redistributed proportionally across all other uncapped buckets. Within each bucket, the excess weight is distributed proportionally only across all other uncapped countries (after step 2) within this bucket. Within each bucket and each country, the excess weight is distributed proportionally only across all other uncapped bonds (after step 1) within this bucket and this country.

The steps 1-3 are repeated until final weightings are capped at 3% maximum per issuer of corporate bonds, 10% maximum - or equal weight if less than 10 countries - per country (of risk) within each bucket and 50% maximum per bucket.

The index is rebalanced monthly as of the close of business on the final trading day of each month. There is no minimum number of securities required to comprise the index.

The MVIS Emerging Markets Aggregate Bond Index is calculated as a total return gross index in USD and has the following identifiers:

Index Type	ISIN	SEDOL	WKN	Bloomberg	Reuters
Total Return Gross Index	DE000SLA2EM6	B8YQ2Y7	SLA2EM	MVEMAG	.MVEMAG

From the MVIS Emerging Markets Aggregate Bond Index four sub-indices are calculated as a total return index in USD with the following identifiers:

MVIS Emerging Markets Sovereign Bond Index (USD&EUR)

Index Type	ISIN	SEDOL	WKN	Bloomberg	Reuters
Total Return Gross Index	DE000SLA4EM2	BD4TM41	SLA4EM	MVEMSD	.MVEMSD

MVIS Emerging Markets Sovereign Bond Index (local FX)

Index Type	ISIN	SEDOL	WKN	Bloomberg	Reuters
Total Return Gross Index	DE000SLA4EN0	BD4TM52	SLA4EN	MVEMSL	.MVEMSL

MVIS Emerging Markets Corporate Bond Index (USD&EUR)

Index Type	ISIN	SEDOL	WKN	Bloomberg	Reuters
Total Return Gross Index	DE000SLA4EP5	BD4TM63	SLA4EP	MVEMCD	.MVEMCD

MVIS Emerging Markets Corporate Bond Index (local FX)

Index Type	ISIN	SEDOL	WKN	Bloomberg	Reuters
Total Return Gross Index	DE000SLA4EQ3	BD4TM74	SLA4EQ	MVEMCL	.MVEMCL

The indices were launched on 19 September 2013 with a base index value of 1000.00 as of 30 June 2010. Historical data has been extended to 30 June 2008.

3.2 MVIS® US Investment Grade Floating Rate Index

The MVIS US Investment Grade Floating Rate Index is designed to track the performance of US investment grade floating rate notes with an amount outstanding of greater than or equal to 500 million USD.

Instrument Types

The index is composed of USD denominated floating rate notes, issued by corporate entities or similar commercial entities that are public reporting companies in the United States, with at least one investment grade rating. The Index Owner may include new types of floating rate instruments that satisfy the eligibility criteria but, as of the date of this publication, have not yet been created or brought to market in the index. Investment grade floating rate notes must be issued by issuers that are formed as corporations, limited liability companies and similar types of entities that are engaged in a financial or commercial enterprise. Notes issued by governments, sovereigns, quasi-sovereigns, not-for-profit entities and government backed entities are not eligible.
For purposes of selecting securities, the Index Owner does not distinguish between affiliated and non-affiliated holders. Accordingly, securities would be deemed to be outstanding even if held entirely by affiliates of the issuer. Securities included in the index may not be reportable via FINRA's Trade Reporting and Compliance Engine® (TRACE®). Eligible notes may, but are not required to be, listed on a US securities exchange.
Securities must provide for payment in the regular course of business of interest or dividends for inclusion although interest or dividends must be paid at floating rates. Instruments that provide for the ability to defer payment of dividends or coupons are eligible, even if the deferral right is pre-established.
Securities must be USD denominated. Issuers may be either US based or foreign. Issuers or their guarantors must be public reporting companies under Sections 13 or 15(d) of the Securities Exchange Act of 1934.
Securities may be publicly registered, exempt from registration under Section 3(a)(2) of the Securities Act of 1933 (the "Act"), distributed to persons who are qualified institutional buyers under Rule 144A of the Act or issued only on a private placement basis.
Securities must be rated "investment grade" or above by one of three rating agencies. "Investment grade" means a rating of Baa3/BBB- or above, as applicable, by these agencies. To be eligible, Securities may not be rated "below investment grade" by one of the three. "Below investment grade" means Ba1/BB+ or below, as applicable, by these agencies.
Repackaged securities linked to a security, a basket of securities or an index, swaps, ETFs, preferred securities, convertible securities, notes with options or warrants attached, bearer bonds, sukuk bonds, fixed to floating rate bonds, dual currency bonds and asset-backed or other structured securities are not eligible.
Securities included in the index must have a minimum of 6 months remaining to maturity.

Weighting Methodology

The index uses a modified market cap weighting methodology that groups securities into 3 maturity buckets (longest one-third, middle one-third and shortest one-third by maturity). It targets a weight of 66%, 22% and 12% for the longest one-third, middle one-third, and shortest one-third maturity bucket, respectively. The weight of any single constituent is capped at 2%. If constituents exceed the maximum weight, then the weight will be reduced to the maximum weight and the excess weight shall be redistributed proportionally across all other index constituents. This process is repeated until no securities have weights exceeding the respective maximum weight.

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1. Calculate the original weight for each of n constituents (C_i)

$$Weight\ C_i = \frac{(3:00pm\ Bid\ C_i + Accrued\ Interest\ C_i) * Amount\ Outstanding\ C_i}{\sum_{i=1}^{n}[(3:00pm\ Bid\ C_i + Accrued\ Interest\ C_i) * Amount\ Outstanding\ C_i]}$$

2. Scale the Original Weight
   - Sort constituents (C_i) by Maturity Date
   - Group them into three buckets (longest third, middle third and shortest third)
   - Assign the Target Weight of the bucket as follows:
     - Weight of longest maturity bucket = 66%
     - Weight of middle maturity bucket = 22%
     - Weight of shortest maturity bucket = 12%
   - Calculate $Scale1$ for each bucket:

$$Scale1 = \frac{Target\ Weight}{\sum_{i=1}^{n}(Original\ Weight\ in\ each\ bucket)}.$$

3. Calculate New Weight

$New\ Weight = Original\ Weight * Scale1$ of the corresponding bucket.

4. The weight of any constituent floating rate note may not account for more than 2% of the value of the index.
   - Constituents exceeding 2% weightings in the index are capped at 2% and remaining weight is redistributed proportionately across the remaining constituents that represent less than 2% of the index. The redistribution is repeated accordingly until no class of notes included in the index has a weighting in excess of 2%.
   - Note: The asset diversification rules and 2% weight limit described above applies only to individual floating rate notes. More than one floating rate note of a single issuer or guarantor may be eligible for inclusion in the index, and different floating rate notes issued by the same issuer or guaranteed by the same guarantor will not be aggregated in order to calculate the 2% weight limit. As a result, an issuer or guarantor may represent more than 2% of the index.

The index is rebalanced monthly as of the close of business on the final trading day of each month. There is no minimum number of securities required to comprise the index.

The MVIS US Investment Grade Floating Rate Index is calculated as a total return gross index and has the following identifiers:

Index Type	ISIN	SEDOL	WKN	Bloomberg	Reuters
Total Return Gross index	US57062N1046	B9FKZS0	A1RRU1	MVFLTR	.MVFLTR

The index was launched on 10 February 2011 with a base index value of 1000.00 as of 10 February 2011.

4 Ongoing Maintenance

"Event Driven Rebalancing" will only occur following an event which changes the principal amount outstanding (e.g., due to a partial redemption by the issuer, a call or similar event) or changes the pay-out or other fundamental characteristics of the securities, such as a default, including as a result of a bankruptcy or similar event affecting the issuer or a third party guarantor. The Index Owner will consider a security to be in default if it is rated "D" by any one of the three rating agencies mentioned above.
An "Event Driven Rebalancing" may result in the removal of a non-compliant security, or portion thereof, and/or a re-weighting of the index. The Index Owner is responsible for determining if an Event Driven Rebalancing has occurred.
If a Rebalancing Event has occurred after the close of trading on a trading date that is not subject to a recommended early US closing time by SIFMA or, if such day is a trading day but is subject to a recommended early closing time, as published by SIFMA for the US market or on a day that is not a trading day, the index will be adjusted and rebalanced as of the close of business on the next trading day.

4.1 Special Events - MVEMAG

- For Full Tender, Early Redemption or Full Call, the bond will be treated as cash in all calculations. For the avoidance of doubt a tender must be mandatory, the pure offer to tender a bond will not lead to an adaption of the index.

- A Partial Tender or Partial Redemption will be considered by treating the redemption amount as cash that will be reinvested into the index on the effective redemption date. The bond will still be included in the index. but with a smaller amount outstanding (i.e. a smaller weight) regardless of whether the remaining amount outstanding satisfies the amount outstanding requirements. This bond will then be reviewed for eligibility at the next monthly review.

- Partial Redemptions or Partial Calls that are not scheduled partial redemptions will not be considered in the index until the next rebalancing, taking into account a smaller amount outstanding.

- Distressed Debt Exchange Offers: in case more than 90% of the Amount Outstanding is exchanged in a Distressed Debt Exchange with the new bond having different characteristics (maturity, coupon or Amount Outstanding) or trading at a substantially different price, the old bond will be redeemed at the latest available price with the proceeds held as "Paid Cash" and reinvested into the index on the following Adjustment Day.

- A bond is identified as trading flat, i.e. the issuer is not able to meet his interest rates payment obligations. Accrued interests and coupons will be set to 0 in the return calculation.

- A debt increase will not be taken into account until the next monthly review.

- If the rating of a bond is set to D from one rating agency, the bond will be kept in the index until the next monthly review.

- In Other Material Events, the Index Owner will review all material changes made to constituents in order to determine whether the constituent continues to satisfy eligibility criteria. In the event of a possible or pending bankruptcy, conservatorship or similar event involving the issuer, the parent of the issuer or the guarantor of the constituent, the Index Owner may, but is not required to remove such constituent. Upon a bankruptcy filing of an issuer, the parent of the issuer or the guarantor of the constituent, the Index Owner may remove the constituent of such issuer at the time of such event even if the security continues to satisfy reporting and other eligibility criteria. In addition, the Index Owner may, but is not required to, remove the constituent upon the occurrence of a material event that could adversely impact the tax treatment to a US tax payer holder or the ability of the index calculator to value the security. For example, to the extent that an issuer of a security is merged with another entity and that merger would result in an adverse change to the holders, the Index Owner may, but would not be required to, remove the security at the next rebalancing, even though the security continues to satisfy reporting and other eligibility criteria.

4.2 Special Events - MVFLTR

- In case of a Full Tender, Redemption, Call or Forced Conversion, the constituent is kept in the index with its last available price.
- In case of a Partial Tender, Redemption, Call or Forced Conversion, the constituent is kept in the index with its full weight. The amount outstanding is not adjusted.
- If conversions occur as a result of holder exercises and not as a result of a forced conversion by the issuer, then the resulting rebalancing will not be treated as an Event Driven Rebalancing but, instead, will be reflected in the course of the ordinary monthly rebalancing.
- A bond is identified as trading flat, i.e. the issuer is not able to meet his interest rates payment obligations. Accrued interests and coupons will be set to 0 in the return calculation.
- A debt increase will not be taken into account until the next monthly review.
- If the rating of a bond is set to D from one rating agency, the bond will be kept in the index until the next monthly review.
- In Other Material Events, the Index Owner will review all material changes made to constituents in order to determine whether the constituent continues to satisfy eligibility criteria. In the event of a possible or pending bankruptcy, conservatorship or similar event involving the issuer, the parent of the issuer or the guarantor of the constituent, the Index Owner may, but is not required to remove such constituent. Upon a bankruptcy filing of an issuer, the parent of the issuer or the guarantor of the constituent, the Index Owner may remove the constituent of such issuer at the time of such event even if the security continues to satisfy reporting and other eligibility criteria. In addition, the Index Owner may, but is not required to, remove the constituent upon the occurrence of a material event that could adversely impact the tax treatment to a US tax payer holder or the ability of the index calculator to value the security. For example, to the extent that an issuer of a security is merged with another entity and that merger would result in an adverse change to the holders, the Index Owner may, but would not be required to, remove the security at the next rebalancing, even though the security continues to satisfy reporting and other eligibility criteria.

4.3 Changes to the Index Guide

Any changes to the Index Guide will be reviewed and approved by the 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. MVIS will generally disseminate a notification related to an Index Guide change 60 days prior to the change. A shorter period of time may be applied at MVIS's 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 MVIS's response to those comments will be made publicly accessible after any consultation, except where confidentiality has been requested by the originator of the comments.

4.4 Discretion regarding the Use of Input Data

Pursuant to Art. 12 No.1. (b), MVIS 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, MVIS may use or change the data at its own discretion according to the following discretion policy after a plausibility check. This may include

- Liquidity and size data,
- Country, sector, issuer and type classification,
- Event information,
- Coupons and other secondary data.

Any changes to input data that MVIS intends to apply because of missing data, different data from different sources or other information concluding the inappropriateness or incorrectness of data 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. MVIS 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 on the use of data in similar cased for the future an update of the index rules can be taken into consideration if applicable. 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 MVIS and will include the reasoning for said judgement or discretion.

4.5 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, MVIS 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, MVIS 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;
- 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.

MVIS 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

5.1 Index Formula - MVEMAG

The index is calculated as

$$Index_t = Index_R * \frac{MV_t + Cash_t}{BV_R}$$

with

$Index_t$	= Index Value at time (t),
MV_t	= Market value of bonds at time (t),
$Cash_t$	= Cash amount at time (t),
BV_t	= Base value at time (t),
R	= previous rebalancing date.

For the market value, the base value and the cash amount, the following relationships hold:

$$\begin{aligned} BV_t &= \sum_{i=1}^{n}(p_{i,R} + AI_{i,R} + CAP_{i,R} + CP_{i,R}^{adj})/100 * SF_{i,R} * A_{i,R} * CF_{i,R} * FX_{i,R}, \\ MV_t &= \sum_{i=1}^{n}(p_{i,t} + AI_{i,t} + CAP_{i,t} + CP_{i,t}^{adj})/100 * SF_{i,t} * A_{i,t} * CF_{i,R} * FX_{i,t}, \\ Cash_t &= CC_t + CS_t + CE_t. \end{aligned}$$

with

$p_{i,t}$	= 4pm EST mid price of bond (i) at time (t),
$AI_{i,t}$	= Accrued Interest of bond (i) at time (t),
$CAP_{i,t}$	= Capitalization of coupons of bond (i) at time (t),
$CP_{i,t}^{adj}$	= Negative accruals (ex-coupon period) of bond (i) at time (t),
$SF_{i,t}$	= Sink Factor of bond (i) at time (t),
$A_{i,t}$	= Amount outstanding of bond (i) at time (t),
$CF_{i,t}$	= Cap/weighting factor of bond (i) at time (t),
$FX_{i,t}$	= Exchange rate of bond (i) at time (t),
CC_t	= Aggregated, weighted coupon payments at time (t), set to 0 at each rebalancing date,
CS_t	= Aggregated, weighted sinking payments at time (t), set to 0 at each rebalancing date,
CE_t	= Aggregated, weighted extraordinary payments (special event) at time (t), set to 0 at each rebalancing date,
n	= Number of securities in index.

For the cash amount, the following relationships hold:

$$
\begin{aligned}
CC_t &= CC_{t-1} + \sum_{i=1}^{n} \frac{Coupon_{i,t}}{100} * SF_{i,t-1} * A_{i,t} * CF_{i,R} * FX_{i,t}, \\
CS_t &= CS_{t-1} + \sum_{i=1}^{n} \frac{SP_{i,t}}{100} * A_{i,t} * CF_{i,R} * FX_{i,t}, \\
CE_t &= \begin{cases} CE_{t-1} + \sum_{i=1}^{n} \frac{EP_{i,t} + AI_{i,t} + CAP_{i,t} + CP_{i,t}^{adj}}{100} * SF_{i,t-1} * A_{i,t} * CF_{i,R} * FX_{i,t}, & \text{if } EP_{i,t} \neq 0 \\ CE_{t-1}, & \text{if } EP_{i,t} = 0 \end{cases}
\end{aligned}
$$

with
$Coupon_{i,t}$ = Coupon rate of bond (i) at time (t),
$SP_{i,t}$ = Sinking payment of rate bond (i) at time (t),
$EP_{i,t}$ = Extraordinary payment of bond (i) at time (t),) where EP can be any payment derived from a corporate action.

5.2 Index Formula - MVFLTR

The index is calculated as

$$Index_t = Index_{t-1} * \frac{MV_t \pm \Delta MV_R}{MV_{t-1}}$$

with
$Index_t$ = Index Value at time (t),
MV_t = Market value of bonds at time (t),
ΔMV_R = Difference between closing and adjusted closing market value of the index on review date.

For the market value and the base value, the following relationships hold:

$$
\begin{aligned}
MV_t &= \sum_{i=1}^{n} (p_{i,t} + AI_{i,t} + CAP_{i,t} + CP_{i,t}^{adj} + Cash_{i,t})/100 * SF_{i,t} * A_{i,t} * CF_{i,R} * FX_{i,t}, \\
Cash_{i,t} &= CC_{i,t} + CS_{i,t} + CE_{i,t}.
\end{aligned}
$$

with

$p_{i,t}$ = 4pm EST price of bond (i) at time (t) - bid for MVFLTR, mid for MVTHHY,
R = previous rebalancing date,
$AI_{i,t}$ = Accrued Interest of bond (i) at time (t),
$CAP_{i,t}$ = Capitalisation of coupons of bond (i) at time (t),
$CP^{adj}_{i,t}$ = Negative accruals (ex-coupon period) of bond (i) at time (t),
$SF_{i,t}$ = Sink Factor of bond (i) at time (t),
$A_{i,t}$ = Amount outstanding of bond (i) at time (t),
$CF_{i,t}$ = Cap/weighting factor of bond (i) at time (t),
$FX_{i,t}$ = Exchange rate of bond (i) at time (t),
$Cash_{i,t}$ = Aggregated cash of bond (i) amount at time (t),
$CC_{i,t}$ = Aggregated coupon payments of bond (i) at time (t), set to 0 at each rebalancing date,
$CS_{i,t}$ = Aggregated sinking payments of bond (i) at time (t), set to 0 at each rebalancing date,
$CE_{i,t}$ = Aggregated extraordinary payments of bond (i) (special event) at time (t), set to 0 at each rebalancing date,
n = Number of securities in index.

For the cash amount, the following relationships hold:

$$\begin{aligned} CC_{i,t} &= CC_{i,t-1} + Coupon_{i,t}, \\ CS_{i,t} &= CS_{i,t-1} + SP_{i,t}, \\ CE_{i,t} &= CE_{i,t-1} + RP_{i,t} + RA_{i,t}. \end{aligned}$$

with

$Coupon_{i,t}$ = Coupon rate of bond (i) at time (t),
$SP_{i,t}$ = Sinking payment of rate bond (i) at time (t),
$RP_{i,t}$ = Redemption price (incl. accruals and capitalizations) of bond (i) at time (t),
$RA_{i,t}$ = Reinvest Amount of bond (i) at time (t).

5.3 Input Data

The following rounding procedures are used for the index calculation:

- Rounding to 2 decimal places:
  - index values.

All other parameters are not rounded.

5.4 Data Correction and Disruptions

MVIS will usually receive information about errors or disruption from calculation agent, 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.
- MVIS 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 MVIS 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 MVIS 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.
- MVIS prompts calculation agent to make all efforts to restart index calculation.
- MVIS prompts Dissemination agent to make all efforts to restart index dissemination.
- MVIS 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 MVIS 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 MVIS will try use another calculation and/or dissemination agent.

6 Appendix

6.1 MVIS Bond Indices

MVIS® Emerging Markets Aggregate Bond Index	MVIS® Emerging Markets Corporate Bond Index (USD&EUR)
MVIS® Emerging Markets Corporate Bond Index (local FX)	MVIS® Emerging Markets Sovereign Bond Index (USD&EUR)
MVIS® Emerging Markets Sovereign Bond Index (local FX)	MVIS® US Investment Grade Floating Rate Index

6.2 Names and Tickers

Long Name	Short Name	Symbol
MVIS® Emerging Markets Aggregate Bond Index (TR)	MV EM Agg. Bond Idx (TR)	MVEMAG
MVIS® Emerging Markets Sovereign Bond Index (USD&EUR) (TR)	MV EM Sov. Bond Idx (USD&EUR) (TR)	MVEMSD
MVIS® Emerging Markets Sovereign Bond Index (local FX) (TR)	MV EM Sov. Bond Idx (local FX) (TR)	MVEMSL
MVIS® Emerging Markets Corporate Bond Index (USD&EUR) (TR)	MV EM Corp. Bond Idx (USD&EUR) (TR)	MVEMCD
MVIS® Emerging Markets Corporate Bond Index (local FX) (TR)	MV EM Corp. Bond Idx (local FX) (TR)	MVEMCL
MVIS® US Investment Grade Floating Rate Index (TR)	MV US Inv. Grade Fl. Rate Idx (TR)	MVFLTR

6.3 Launch Dates and Base Values

Name	Launch Date	Base Value	Base Date
MVIS® Emerging Markets Aggregate Bond Index (TR)	19 September 2013	1000.00	30 June 2010
MVIS® Emerging Markets Sovereign Bond Index (USD&EUR) (TR)	19 September 2013	1000.00	30 June 2010
MVIS® Emerging Markets Sovereign Bond Index (local FX) (TR)	19 September 2013	1000.00	30 June 2010
MVIS® Emerging Markets Corporate Bond Index (USD&EUR) (TR)	19 September 2013	1000.00	30 June 2010
MVIS® Emerging Markets Corporate Bond Index (USD&EUR) (TR)	19 September 2013	1000.00	30 June 2010
MVIS® US Investment Grade Floating Rate Index (TR)	10 February 2011	1000.00	10 February 2011

6.4 Changes to the Index Guide

This table contains all changes to the index guide after 1 January 2018, when the European Benchmark Regulation became effective.

Date	IG Version	Change
2 July 2018	2.3	MVEMAG/MVRCOV: Addition of distressed debt exchange offers
12 September 2018	2.4	Inclusion of additional chapters to comply with BMR
30 November 2018	2.5	MVEMAG: Inclusion of government sukuk bonds
1 May 2019	2.6	Removal of MVRCOV, MVRCDE and MVRCDI

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