

# INPUT DATA POLICY

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## 1 PURPOSE

The quality of an Index and the accuracy and reliability of its calculation depend, among other factors, on precise and correct Input Data. The BMR requires Solactive, in its capacity as an administrator of Indices serving as benchmarks, to have in place robust procedures for the control of Input Data.

This policy defines 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 that the Input Data is sufficient to represent accurately and reliably the market or economic reality that an Index is intended to measure, as well as the compliance of the Input Data with the relevant Index methodology.

Furthermore, the policy establishes measures to monitor, where feasible, Input Data prior to the publication of an Index and to validate Input Data after publication, including, where applicable, comparing data against historical patterns to ensure the integrity and accuracy of the Index.

Finally, the policy contains rules for the case Solactive considers that the Input Data does not represent the market or economic reality that the relevant Index is intended to measure, as well as the potential measures to take to address such an event. These measures include, but are not limited to, changing the Input Data or the methodology in order to ensure that the Input Data does represent such market or economic reality, or ceasing to provide the relevant Index.

## 2 SCOPE

This policy applies globally to all Indices administered by Solactive.

This policy does not apply to factors that do not measure the underlying market or economic reality the relevant Index intends to measure, such as data used to determine the composition of the Index and its regular review. In general, such factors are embedded in the methodology and represent elements that improve the reliability and representativeness of an Index. Changes of such factors are not taken into account every time the level of an Index is determined, but only in instances that are pre-defined in the methodology (e.g. selection dates and adjustment dates). In contrast, changes to the values of Input Data are taken into account by the methodology every time the level of an Index is determined because they reflect changes in the underlying market or economic reality the relevant Index intends to measure.

## 3 GENERAL PRINCIPLES

All Indices administered by Solactive are calculated using, in principle:

- readily available Transaction Data sourced via vendors from stock exchanges and/or the closing level of the applicable underlying Index; or
- readily available data determined by providers, based on rule-based procedures using a combination of valuation models and available transaction data, e.g. Evaluated Bond Prices.



The methodology of an Index may require that the data used directly for the determination of the level of an Index is first calculated by Solactive on the basis of rule-based calculation models. Such models comply with market standards and are verified at implementation. For the calculation, however, only data that meet the aforementioned requirements and are readily available are used.

Solactive does not use contributed Input Data.

The Input Data shall meet the following requirements:

- it shall be sufficient and appropriate to represent accurately and reliably the market or economic reality that the relevant Index is intended to measure;
- it shall be Transaction Data or Evaluated Bond Prices, if available and appropriate; and
- it shall be verifiable.

In accordance with the procedure described below, Solactive shall ensure that:

- it has the necessary information to ensure the appropriateness and verifiability of the Input Data;
- it takes into consideration the characteristics of the underlying market or economic reality as well as the applicable methodology when deciding on the relevant Input Data and the vendor for such data; and
- it monitors Input Data on a regular basis, reflecting the vulnerability of its specific type.

## 4 APPROPRIATENESS OF INPUT DATA

### 4.1 DETERMINATION OF DATA SOURCE

As part of the process of determining the Index methodology of a new Index, the Product Development Team decides on the respective data sources that will be used for the sourcing of the necessary Input Data. As a general principle, Solactive will prefer readily available Transaction Data or Evaluated Bond Prices as Input Data for Indices. Such data are usually consumed by a broad public (e.g. for valuations or investment decisions), and are therefore highly transparent, reflect the market for publicly traded asset classes, and are less susceptible to manipulations of any kind.

Only to the extent that such Transaction Data or Evaluated Bond Prices are not sufficiently available, or where they are inappropriate as a reflection of the specific economic reality the Index intends to measure, non-Transaction Data may be considered.

Such assessment of non-Transaction Data will be documented and retained in accordance with Solactive's Record Keeping Policy.

### 4.2 MONITORING OF INPUT DATA

Readily available Transaction Data or Evaluated Bond Prices for Index constituents are an expression of the valuation of instruments by the market and thus represent that market or economic reality accurately and reliably. It should be noted that the question of whether the Index methodology is still suitable for



achieving the index's goal must be considered independently. This assessment is carried out within the framework of the regular review of the Index methodology.

## 5 SUITABILITY OF DATA VENDOR

Solactive makes use of a wide range of financial data vendors commonly used by financial market participants to ensure access to a large variety of Input Data, including Transaction as well as non-Transaction Data. Under certain circumstances, however, access to non-Transaction Data is only possible via specialized data vendors.

In selecting new data vendors and regularly reviewing existing data vendors, Solactive applies a set of transparent criteria and follows a clearly defined process.

### 5.1 SELECTION OF NEW DATA VENDORS

Before a data vendor is selected, the team within Solactive responsible for the initial set-up of the index carries out an assessment based on the following criteria, which serve as an overarching benchmark:

- accuracy and integrity of data provided;
- availability of historical records;
- high service levels; and
- general reputation and market acceptance of the data vendor.

In some cases, the initial set-up of the index may be performed by the Operations Team, while in others, the Product Development Team may perform the initial set-up.

The key factor in assessing potential data vendors is the quality of Input Data they can offer. The accuracy, reliability and integrity of the used Input Data is of paramount importance. This is further supplemented by the need for historical records, if possible, covering large periods of time and in sufficient detail.

For a provider of customized financial Indices, such as Solactive, flexible support is also very important. An additional indicator, albeit to be considered with reservation, is the general reputation and acceptance of a data vendor in the financial services industry. With the exception of specialized data vendors, an analysis of a data vendor at the most granular level is not feasible in most cases. The prevalence, market position and market acceptance of a data vendor is regarded as an indicator for acceptable quality standards.

The first step of the assessment of potential data vendors is initiated by the relevant Operations Team or Product Development Team by providing the data vendor with an exhaustive questionnaire. This subsequently serves as basis for an evaluation of the data vendor by the relevant Operations Team or Product Development Team. The data vendor's answers and statements are checked against the general criteria set out above and the requirements of the specific Index and/or the type of Input Data. The results are documented by the relevant Operations Team or Product Development Team in an evaluation report.



This questionnaire as well as the evaluation report are retained in accordance with Solactive's Record Keeping Policy.

## 5.2 REVIEW OF EXISTING DATA VENDORS

Existing data vendors will be reassessed on a regular basis or whenever considered necessary by Solactive. The overall responsibility for the regular review and evaluation of data vendors lies with the CIO.

## 6 VERIFICATION OF INPUT DATA

The verification of Input Data is relevant on an ongoing basis during the lifetime of an Index. Solactive has implemented effective technical processes to ensure the continuous quality of end-of-day Input Data used for the calculation of its Indices. These processes are designed differently depending on the type of asset class of the financial instrument for which the Input Data is required to determine the Index level, and entail automated assessments at the level of individual Input Data values as well as further plausibility checks of the aggregated Index levels.

For Input Data relating to equity instruments, the processes include:

- as far as possible, taking into account the calculations to be made to determine the Index level, a verification of end-of-day Input Data against data from a second data vendor before the end-of-day Index level is determined and published;
- if there is a discrepancy between the data of the two data vendors, a comparison is made with the data of the primary source (usually the stock exchange on which the relevant financial instrument is traded);
- in addition, the Input Data used is continuously monitored so that any subsequent changes to this data, for example as a result of a subsequent correction of the data by the trading venue, can be identified, and the Index levels, if necessary, can be corrected promptly in accordance with the Solactive Correction Policy.

For Input Data relating to fixed income/bond instruments, the processes include:

- a comparison of bond prices used for the end-of-day Index level determination against the prices for the same instrument on the immediately preceding Index level determination day;
- a comparison of Index levels with the index levels of similar third-party indices to identify any deviation that could require further investigation;
- a comparison of the daily return of the relevant Index with historical daily returns of this Index to identify unusual deviations that may require further investigation.

For Indices containing instruments from both of the above asset classes, comparable measures are taken.

In order to ensure the reliability of the intra-day determination of the Index level, these levels are subjected to a plausibility check prior to their publication. If the intra-day Index level exceeds a defined deviation



(usually +3% and -3% from its closing level on the immediately preceding calculation day), a plausibility check is triggered. The plausibility check includes an investigation of the reason(s) for the deviation. For instance, the check could be triggered because one of the prices in the Input Data deviates substantially. This process allows Solactive to recognize any errors in the Input Data. If, after the investigation, it has been deemed that there is an error in the Input Data, Solactive will not publish the Index level.

A supplementary quality control is the in-depth analysis of selected data samples in longer intervals. This measure is intended to provide an even greater level of scrutiny and to detect potential conduct indicating manipulation of the data.

Solactive maintains long-term records of the Input Data used for each Index determination, and is able to verify a determination retrospectively.

## 7 DEFINITIONS

For the purpose of this document, the defined terms used herein shall have the following meaning:

'BMR' means Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 on Indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds.

'CIO' means the Chief Indexing Officer.

'Correction Policy' means Solactive's policy governing the process to be applied where errors in the Index determination and calculation process occur.

'Evaluated Bond Prices' means readily available data for prices of bonds and other comparable debt instruments. The prices are determined by specialized providers based on rule-based procedures using a combination of valuation models and available transaction data.

'Index' (or 'Indices') refers to an index as defined in Article 3(1)(1) of the BMR.

'Input Data' means the data in respect of the value of one or more underlying assets, or prices, including estimated prices, quotes, committed quotes or other values, used by an administrator to determine an Index. FX rates are also considered Input Data, provided that such FX rates are used every time the level of an Index is determined.

'Operations Team' means the team within Solactive that is responsible for the day-to-day maintenance of an Index, including determination and distribution of Index levels, as well as ordinary and extraordinary adjustments, for example, after the occurrence of corporate actions with regard to the constituents of an Index or in the course of the regular rebalancing of an Index.

'Product Development Team' means the team within Solactive that is responsible for the development of the methodology for determining an Index.

'Record Keeping Policy' means Solactive's policy governing the processes to meet the record keeping requirements under Article 8 of the BMR.

'Solactive' means Solactive AG and its subsidiaries.

'Termination Policy' means Solactive's policy governing the processes for termination of an Index.



'Transaction Data' means observable prices, rates, indices or values representing transactions between unaffiliated counterparties in an active market subject to competitive supply and demand forces.



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