Bloomberg Cash Deposit Indices Methodology

June 2024

Bloomberg

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Introduction

This methodology (the "Methodology") has been made available by Bloomberg Index Services Limited ("BISL") and sets out the rules, criteria, risk factors and other information application to the Bloomberg Cash Deposit Indices (the "Indices" and each, an "Index"). Capitalized terms used in this Methodology but not otherwise defined have the meanings set forth in Appendix I (Glossary).

Objectives and Key Features

The Bloomberg Cash Deposit Indices aim to reflect the performance of investing a cash instrument at a specified Cash Rate.

Section 1: Calculation

Index Value

With respect to each Index, the Closing Index Value on the Index Base Date shall be the Index Base Value. Thereafter, the Index Value with respect to each subsequent Index Business Day, t, and Fixing, f, shall be calculated in accordance with the following formula, subject to Section 1 ("Rounding"):

$$I_{\langle t,f \rangle} = I_{\langle t-1,close \rangle} + UnitsReturn_{\langle t,f \rangle} + ActionsReturn_{\langle t,f \rangle} + EventsReturn_{\langle t,f \rangle} \tag{1}$$

Where:

$t-1$ means the Index Business Day immediately preceding t;

$close$ means the Closing Fixing;

$I_{\langle t,f \rangle}$ and $I_{\langle t-1,close \rangle}$ mean the Index Values for Fixing f on Index Business Day t and the Closing Fixing on Index Business Day $t-1$ respectively;

$UnitsReturn_{\langle t,f \rangle}$ means the return attributed to the Units at Fixing f on Index Business Day t, calculated in accordance with the following formula:

$$UnitsReturn_{\langle t,f \rangle} = U_t^c \times \left(P_{\langle t,f \rangle}^c \times FX_{\langle t,f \rangle}^c - P_{\langle t-1,close \rangle}^c \times FX_{\langle t-1,close \rangle}^c \right) \tag{2}$$

Where:

c means the Cash Constituent;

U_t^c means the Units for the Cash Constituent c on Index Business Day t;

$P_{\langle t,f \rangle}^c$ means the Price of the Cash Constituent c at Fixing f on Index Business Day t;

$P_{\langle t-1,close \rangle}^c$ means the Price of the Cash Constituent c at the Closing Fixing on Index Business Day $t-1$;

$FX_{\langle t,f \rangle}^c$ means the Spot Exchange Rate to convert one unit of the Constituent Currency of the Cash Constituent c to the Index Currency at Fixing f on Index Business Day t;

$FX_{\langle t-1,close \rangle}^c$ means the Spot Exchange Rate to convert one unit of the Constituent Currency of the Cash Constituent c to the Index Currency at the Closing Fixing on Index Business Day $t-1$;

$ActionsReturn_{\langle t,f \rangle}$ means the return attributed to the Actions at Fixing f on Index Business Day t, calculated in accordance with the following formula:

$$ActionsReturn_{\langle t,f \rangle} = \sum_{a \in Actions_{\langle t,f \rangle}^c} IU_t^{c,a} \times \left(P_{\langle t,f \rangle}^c \times FX_{\langle t,f \rangle}^c - P_{\langle t,f(a) \rangle}^c \times FX_{\langle t,f(a) \rangle}^c \right) \tag{3}$$

Where:

$Actions_{\langle t,f \rangle}^c$ means the set of Actions for the Cash Constituent c on Index Business Day t with Fixings up to and including Fixing f;

a means an Action;

$IU_t^{c,a}$ means the Incremental Units for the Cash Constituent c and Action a on Index Business Day t;

$f(a)$ means the Fixing of Action a;

$P^c_{(t,f(a))}$ means the Price of the Cash Constituent c at Fixings $f(a)$ on Index Business Day t;

$FX^c_{(t,f(a))}$ means the Spot Exchange Rate to convert one unit of the Constituent Currency of the Cash Constituent c to the Index Currency at Fixing $f(a)$ on Index Business Day t;

$EventsReturn_{(t,f)}$ means the return attributed to Events at Fixing f on Index Business Day t, calculated in accordance with the following formula:

$$EventsReturn_{(t,f)} = \sum_{e \in Events^c_{(t,f)}} IU^{c,e}_t \times \left(P^c_{(t,f)} \times FX^c_{(t,f)} - P^c_{(t,f(e))} \times FX^c_{(t,f(e))} \right) \tag{4}$$

Where:

$Events^c_{(t,f)}$ means the set of Events for the Cash Constituent c on Index Business Day t with Fixings up to and including Fixing f;

e means an Event;

$IU^{c,e}_t$ means the Incremental Units for the Cash Constituent c and Event e on Index Business Day t;

$f(e)$ means the Fixing of Event e;

$P^c_{(t,f(e))}$ means the Price of the Cash Constituent c at Fixing $f(e)$ on Index Business Day t; and

$FX^c_{(t,f(e))}$ means the Spot Exchange Rate to convert one unit of the Constituent Currency of the Cash Constituent c to the Index Currency at Fixing $f(e)$ on Index Business Day t.

Units

With respect to the Cash Constituent, the Units on the Index Base Date shall be 0 (zero). Thereafter, the Units with respect to the Cash Constituent, c, and subsequent Index Business Day, t, shall be calculated in accordance with the following formula:

$$U^c_t = U^c_{t-1} + \sum_{a \in Actions^c_{t-1}} IU^{c,l}_{t-1} + \sum_{e \in Events^c_{t-1}} IU^{c,e}_{t-1} \tag{5}$$

Where:

$t - 1$ means the Index Business Day immediately preceding t;

U^c_t and U^c_{t-1} mean the Units for the Cash Constituent c on Index Business Days t and $t - 1$ respectively;

$Actions^c_{t-1}$ means the set of Actions for the Cash Constituent c on Index Business Day $t - 1$;

a means an Action;

$IU^{c,a}_{t-1}$ means the Incremental Units for the Cash Constituent c and Action a on Index Business Day $t - 1$;

$Events^c_{t-1}$ means the set of Events for the Cash Constituent c on Index Business Day $t - 1$;

e means an Event; and

$IU^{c,e}_{t-1}$ means the Incremental Units for the Cash Constituent c and Event e on Index Business Day $t - 1$.

Actions and Events

An 'Initial Deposit' Action occurs for the Cash Constituent on the Index Base Date.

An 'Interest Payment' Event occurs for the Cash Constituent on each Index Business Day that is also an Interest Reset Day.

Incremental Units

With respect to the Cash Constituent, c, and Index Business Day, t, the Incremental Units generated by each Action, a, on such day shall be calculated in accordance with the following formulae:

If the Action Type is 'Initial Deposit':

$$IU_t^{c,a} = I_0 \tag{6}$$

Where:

$IU_t^{c,a}$ means the Incremental Units generated by Action a for the Cash Constituent c on Index Business Day t; and

I_0 means the Index Base Value.

With respect to the Cash Constituent, c, and Index Business Day, t, the Incremental Units generated by each Event, e, on such day shall be calculated in accordance with the following formulae:

If the Event Type is 'Interest Payment':

$$IU_t^{c,e} = U_t^c \times \left(\left[\prod_{r \in ResetDays(t-1,t)} \left(1 + Rate_{r-1} \times \frac{Act(r-1,r)}{DPY} \right) \right] - 1 \right) \tag{7}$$

Where:

$IU_t^{c,e}$ means the Incremental Units generated by Event e for the Cash Constituent c on Index Business Day t;

U_t^c means the Units for the Cash Constituent c on Index Business Day t;

$ResetDays(t-1,t)$ means the set of days from, and excluding, Index Business Day $t-1$ to, and including, Index Business Day t, that are Interest Reset Days;

r means an Interest Reset Day;

$r-1$ means the Interest Reset Day immediately preceding Interest Reset Day r;

$Rate_{r-1}$ means the Cash Rate on Interest Reset Day $r-1$;

$Act(r-1,r)$ means the number of calendar days from, and excluding, Interest Reset Day $r-1$ to, and including, Interest Reset Day r; and

DPY means the Days Per Year.

Prices

With respect to each Index Business Day t and the Closing Fixing, the Price of the Cash Constituent c is calculated in accordance with the following formula:

If Index Business Day t is an Index Base Date or Interest Reset Day:

$$P_{\langle t,close \rangle}^c = 1 \tag{8}$$

Else:

$$P_{\langle t,close \rangle}^c = 1 + Rate_r \times \frac{Act(r,t)}{DPY} \tag{9}$$

Where:

$P_{\langle t,close \rangle}^c$ means the Price of the Cash Constituent c at the Closing Fixing on Index Business Day t;

$Rate_r$ means the Cash Rate on Interest Reset Day r;

$Act(r,t)$ means the number of calendar days from, and excluding, Interest Reset Day r to, and including, Index Business Day t; and

DPY means the Days Per Year.

With respect to each Index Business Day t and the Fixing of an Event $f(e)$, the Price of the Cash Constituent c is calculated in accordance with the following formula:

$$P^c_{\langle t,f(e)\rangle} = 0 \tag{10}$$

Where:

$P^c_{\langle t,f(e)\rangle}$ means the Price of the Cash Constituent c at Fixing $f(e)$ on Index Business Day t.

Rounding

The Index Values shall be calculated without rounding and published to 4 decimal places.

Section 2: Backtest assumptions

The rules outlined above are applied historically, however the following assumptions have been made:

The Index Base Date aims to start on the first Interest Reset Day for which Price of a Cash Constituent is available.

Section 3: Stakeholder engagement, risk, and limitations

Limitations of the index

Though the Index is designed to be representative of the markets it measures or otherwise aligns with its stated objective, it may not be representative in every case or achieve its stated objective in all instances. It is designed and calculated strictly to follow the rules of this Methodology, and any Index level or other output is limited in its usefulness to such design and calculation.

Markets can be volatile, including those market interests that the Index measures or upon which the Index is dependent to achieve its stated objective. For example, illiquidity can have an impact on the quality or amount of data available to the administrator for calculation and may cause the Index to produce unpredictable or unanticipated results.

In addition, changes to the availability and/or accuracy of Cash Rates data, may render the objective of the Index unachievable or to become impractical to replicate by investors. They are for the indicative purpose.

In particular, the Index measures the performance of cash. As with all investing, the Index is exposed to market risk. The Cash Rate used may fluctuate with the changes in economic forecasts, interest rate policies established by central banks and perceived geo-political risk. The Index does not take into account the cost of replication and as a result, a tracking portfolio's returns will underperform the Index with all else equal. As the Index is designed to measure those markets, it could be materially impacted by market movements, thus significantly impacting the use or usefulness of the fixings for some or all users.

Section 4: Benchmark oversight and governance

Benchmark governance, audit, and review structure

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

Index and Methodology Changes

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

Expert judgement and Discretion

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

Conflicts of interest

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

Restatement policy

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

Cessation Policy

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

Appendix I: Glossary

Action	An action of the Index strategy that may give rise to a change in units.
Action Type	The type of Incremental Unit calculation for an Action.
Cash Constituent	A cash instrument.
Cash Rate	The rate used in the Index calculation.
Closing Fixing	The Fixing corresponding to the end of day valuation.
Closing Index Value	The value of the Index on any given Index Business Day at the Closing Fixing.
Constituent Currency	The currency in which a given Cash Constituent is represented.
Days Per Year	The number of days assumed to be in a year.
Event	An occurrence that may give rise to a change in units.
Event Type	The type of Incremental Unit calculation for an Event.
Fixing	A given time, specified with respect to a location or time zone.
FX Data Source	The source of FX data for a Fixing.
Incremental Units	The difference in Units attributed to an action or activity on a Fixing.
Index	Has the meaning set forth in the Introduction.
Index Base Date	The first date on which an Index publishes a value.
Index Base Value	The value of an Index on and prior to the Index Base Date.
Index Business Day	The days on which the Index is calculated.
Index Commencement Date	The date on which an index is first published.
Index Currency	The currency in which an index is published.
Index Value	The value of the Index at a given Fixing on an Index Business Day.
Interest Reset Day	The day on which the interest is realized for the period ending on such day, and the Cash Rate is set for the period starting on such day.
Price	If the Cash Constituent is not a Timezone Lagged Constituent and the date for which the Price is with respect to is a Pricing Day, the value of a Cash Constituent as determined from the Price Source with respect to the Fixing. Otherwise, the value of such Cash Constituent as determined from the Price Source with respect to the Closing Fixing on the immediately preceding Pricing Day.
Pricing Day	The days on which Price of the Cash Constituent is quoted.
Price Source	The source of pricing to be used for the Cash Constituent and Fixing.
Spot Exchange Rate	The rate used to convert one unit of a given currency into another currency at a given Fixing on an Index Business Day as determined from the FX Data Source.
Timezone Lagged Constituent	A Cash Constituent for which a lag is applied to account for the notional location of the Cash Constituent relative to that of the Index.
Units	The number of units of each Cash Constituent held on opening of an Index Business Day.

Appendix II: Market Disruptions

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

Appendix III: ESG Disclosures

<table>
<tr>
<td colspan="2">EXPLANATION OF HOW ESG FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY</td>
</tr>
<tr>
<td>1. Name of the benchmark administrator.</td>
<td>Bloomberg Index Services Limited ("BISL")</td>
</tr>
<tr>
<td>2. Type of benchmark</td>
<td>Other Benchmark</td>
</tr>
<tr>
<td>3. Name of the benchmark or family of benchmarks.</td>
<td>Bloomberg Cash Deposit Indices</td>
</tr>
<tr>
<td>4. Does the benchmark methodology for the benchmark or family of benchmarks take into account ESG factors?</td>
<td>No</td>
</tr>
<tr>
<td colspan="2">5. Where the response to Item 4 is positive, please list below, for each family of benchmarks, those ESG factors that are taken into account in the benchmark methodology, taking into account the ESG factors listed in Annex II to Delegated Regulation (EU) 2020/1816.

Please explain how those ESG factors are used for the selection, weighting or exclusion of underlying assets.

The ESG factors shall be disclosed at an aggregated weighted average value at the level of the family of benchmarks.</td>
</tr>
<tr>
<td>a) List of environmental factors considered:</td>
<td>Selection, weighting or exclusion:

N/A</td>
</tr>
<tr>
<td>b) List of social factors considered:</td>
<td>Selection, weighting or exclusion:

N/A</td>
</tr>
<tr>
<td>c) List of governance factors considered:</td>
<td>Selection, weighting or exclusion:

N/A</td>
</tr>
<tr>
<td colspan="2">6. Where the response to Item 4 is positive, please list below, for each benchmark, those ESG factors that are taken into account in the benchmark methodology, taking into account the ESG factors listed in Annex II to Delegated Regulation (EU) 2020/1816, depending on the relevant underlying asset concerned.

Please explain how those ESG factors are used for the selection, weighting or exclusion of underlying assets.

The ESG factors shall not be disclosed for each constituent of the benchmark, but shall be disclosed at an aggregated weighted average value of the benchmark.

Alternatively, all of this information may be provided in the form of a hyperlink to a website of the benchmark administrator included in this explanation. The information on the website shall be easily available and accessible. Benchmark administrators shall ensure that information published on their website remains available for five years</td>
</tr>
<tr>
<td>a) List of environmental factors considered:</td>
<td>Selection, weighting or exclusion:

N/A</td>
</tr>
<tr>
<td>b) List of social factors considered:</td>
<td>Selection, weighting or exclusion:

N/A</td>
</tr>
<tr>
<td>c) List of governance factors considered:</td>
<td>Selection, weighting or exclusion:

N/A</td>
</tr>
</table>

7. Data and standards used.	
a) Data input. *(i) Describe whether the data are reported, modelled or, sourced internally or externally.* *(ii) Where the data are reported, modelled or sourced externally, please name the third party data provider.*	N/A
b) Verification of data and guaranteeing the quality of those data. *Describe how data are verified and how the quality of those data is ensured.*	N/A
c) Reference standards *Describe the international standards used in the benchmark methodology.*	N/A
Date on which information has been last updated and reason for the update:	12 March 2024

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