CoinDesk Market Index (CMI) Methodology

April 2023
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Introduction

Index Objective

The CoinDesk Market Index ("CMI" or the "Index") and its subindices (collectively, "Indices") are a family of broad-based digital asset indices designed to measure the performance of the digital asset market. The family includes indices that reflect sectors defined in CoinDesk's Digital Asset Classification Standard ("DACS"). Constituents must have readily available prices and trade on eligible exchanges as further detailed in Eligibility Criteria below. The CMI Indices are generally weighted by market capitalization unless otherwise specified in Index Construction.

Additional details

CMI is a broad representation of the performance of the digital asset market excluding stablecoins. Additional subindices are available that measure the performance of digital asset sectors and other market segments. CMI may include digital assets that are relatively illiquid or otherwise difficult to access, own, trade or custody. Digital assets that meet all eligibility criteria will be included regardless of their designation as a security by a government agency.

The CMI family is derived from the Digital Asset Classification Standard (DACS). Constituents must be included in DACS to be eligible for the Index. For more information on DACS, please refer to the DACS Glossary and DACS Methodology.

This methodology was created by CDI to achieve the above Index Objective. There may be circumstances or market events which require CDI, in its sole discretion, to deviate from certain rules to ensure each Index continues to meet its objective. This document should be read in conjunction with the CoinDesk Digital Asset Indices Policy Methodology.

Table 1: List of Indices

<table>
<thead>
<tr>
<th>Index Name</th>
<th>Ticker</th>
<th>Launch Date</th>
<th>Base Date</th>
<th>Base Value</th>
<th>First Value Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>CoinDesk Market Index</td>
<td>CMI</td>
<td>9/9/2022</td>
<td>8/29/2022</td>
<td>1000.00</td>
<td>12/29/2017</td>
</tr>
<tr>
<td>CoinDesk Market Plus Stablecoin Index</td>
<td>CMIP</td>
<td>9/9/2022</td>
<td>8/29/2022</td>
<td>1000.00</td>
<td>12/29/2017</td>
</tr>
<tr>
<td>CoinDesk Computing Index</td>
<td>CPU</td>
<td>9/9/2022</td>
<td>8/29/2022</td>
<td>1000.00</td>
<td>12/29/2017</td>
</tr>
<tr>
<td>CoinDesk Culture &amp; Entertainment Index</td>
<td>CNE</td>
<td>9/9/2022</td>
<td>8/29/2022</td>
<td>1000.00</td>
<td>2/2/2018</td>
</tr>
<tr>
<td>CoinDesk Currency Index</td>
<td>CCY</td>
<td>9/9/2022</td>
<td>8/29/2022</td>
<td>1000.00</td>
<td>12/29/2017</td>
</tr>
<tr>
<td>CoinDesk DeFi Index</td>
<td>DCF</td>
<td>9/9/2022</td>
<td>8/29/2022</td>
<td>1000.00</td>
<td>6/4/2018</td>
</tr>
<tr>
<td>CoinDesk Digitization Index</td>
<td>DTZ</td>
<td>9/9/2022</td>
<td>8/29/2022</td>
<td>1000.00</td>
<td>10/4/2021</td>
</tr>
<tr>
<td>CoinDesk Smart Contract Platform Index</td>
<td>SMT</td>
<td>9/9/2022</td>
<td>8/29/2022</td>
<td>1000.00</td>
<td>12/29/2017</td>
</tr>
<tr>
<td>CoinDesk Stablecoin Index</td>
<td>CSC</td>
<td>12/21/2022</td>
<td>8/29/2022</td>
<td>1000.00</td>
<td>2/4/2019</td>
</tr>
<tr>
<td>CoinDesk USD Stablecoin Equal Weight Index</td>
<td>USCE</td>
<td>12/21/2022</td>
<td>8/29/2022</td>
<td>1000.00</td>
<td>8/29/2022</td>
</tr>
</tbody>
</table>

¹ data prior to 8/29/2022 is backcasted history. See Backcast Methodology Appendix.
Eligibility Criteria

Universe eligibility for CMI Index Family

To be included in the Index Universe, a digital asset must meet the following criteria as of the Reconstitution Reference Date:

1. The digital asset must be included in the latest published DACS.
2. The digital asset must have been listed and trading on an Eligible Exchange for a minimum of 30 days leading up to the Reconstitution Reference Date. For details on Eligible Exchanges, refer to the CoinDesk Digital Asset Indices Policy Methodology.
3. The digital asset must be listed on at least two Eligible Exchanges as of the Reconstitution Reference Date.
4. A CoinDesk reference rate (“Reference Rate”) must exist for the digital asset with a minimum of two contributing exchanges (refer to the CoinDesk Reference Rate Methodology for more details).
5. See Table 2 for additional eligibility requirements for each individual CMI Index.

CMI sector and subindices are determined based on DACS screens from the constituents of CMI as defined in Table 2.

Table 2: Additional Eligibility Requirements

<table>
<thead>
<tr>
<th>Index Name</th>
<th>Additional Index Eligibility Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>CoinDesk Market Index</td>
<td>Digital assets not classified in the Stablecoin Sector</td>
</tr>
<tr>
<td>CoinDesk Market Plus Stablecoin Index</td>
<td>No additional eligibility requirements</td>
</tr>
<tr>
<td>CoinDesk Computing Index</td>
<td>Digital assets classified in the Computing Sector.</td>
</tr>
<tr>
<td>CoinDesk Culture &amp; Entertainment Index</td>
<td>Digital assets classified in the Culture &amp; Entertainment Sector</td>
</tr>
<tr>
<td>CoinDesk Currency Index</td>
<td>Digital assets classified in the Currency Sector.</td>
</tr>
<tr>
<td>CoinDesk DeFi Index</td>
<td>Digital assets classified in the DeFi Sector</td>
</tr>
<tr>
<td>CoinDesk Digitization Index</td>
<td>Digital assets classified in the Digitization Sector</td>
</tr>
<tr>
<td>CoinDesk Smart Contract Platform Index</td>
<td>Digital assets classified in the Smart Contract Platform Sector</td>
</tr>
<tr>
<td>CoinDesk Stablecoin Index</td>
<td>Digital assets classified in the Stablecoin Sector</td>
</tr>
<tr>
<td>CoinDesk USD Stablecoin Equal Weight Index</td>
<td>Digital assets classified in the Stablecoin Sector and pegged to the USD</td>
</tr>
</tbody>
</table>
Index Construction

Constituent selection

All digital assets that pass the Eligibility Criteria are selected for index inclusion.

Constituent weighting

With the exception of the CoinDesk USD Stablecoin Equal Weight Index, all indices are weighted by market capitalization. The CoinDesk USD Stablecoin Equal Weight Index is equal weighted at each reconstitution.

Circulating supply

At each reconstitution, the circulating supply for each constituent is determined based on the latest circulating supply on the Weighting Reference Date (see Index Maintenance). The circulating supply is not updated between reconstitutions.

For equal weighted indices, an index supply is calculated on the Weighting Reference Date to achieve equal weights for each constituent. Since the index supply is calculated using prices on the Weighting Reference Date, the actual weight of the constituents will fluctuate based on prices movements of the digital asset constituents.

Index calculation

The indices are calculated in real-time using Reference Rates for each underlying constituent as described below.

Constituent pricing

Real-time Reference Rates for digital asset constituents are calculated approximately every 5 seconds by CDI using a volume weighted average price (VWAP). Please refer to the CoinDesk Reference Rate Pricing Methodology for more details.

Calculation formula

\[
Index_t = Index_{PR} \times (1 + \sum_{i=1}^{N} W_{i,PR} \times \left( \frac{Constituent \ Price_{i,t}}{Constituent \ Price_{i,PR}} - 1 \right))
\]

where:
\[
Index_t = \text{Index Value at time } t
\]
\[
Index_{PR} = \text{Index Value as of prior reconstitution}
\]
\[
W_{i,PR} = \text{Weight of constituent } i \text{ as of prior reconstitution}
\]
\[
N = \text{number of constituents}
\]
Constituent Price\(_{i,t}\) = Reference Rate for constituent \(i\) at time \(t\)

Constituent Price\(_{i,PR}\) = Reference Rate for constituent \(i\) as of prior reconstitution

**Index Maintenance**

**Index reconstitution**

Each Index is reviewed each month based on the rules described above. Any Index changes resulting from the monthly review are announced one week prior to the effective date and implemented on the second business day of the following month.

**Table 4: Reconstitution Timing**

<table>
<thead>
<tr>
<th>Activity Description</th>
<th>Timing</th>
<th>Example Reconstitution Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reconstitution Reference Date</td>
<td>Announcement Date minus 7 business days</td>
<td>10/17/2022</td>
</tr>
<tr>
<td>Announcement Date</td>
<td>Effective Date minus 7 calendar days (following business day if this is a holiday)</td>
<td>10/26/2022</td>
</tr>
<tr>
<td>Lockdown Circulating Supply (Weighting Reference Date)</td>
<td>Effective Date minus 7 calendar days (following business day if this is a holiday)</td>
<td>10/26/2022</td>
</tr>
<tr>
<td>Effective Date</td>
<td>4PM on the 2(^{nd}) business day of the month</td>
<td>11/02/2022</td>
</tr>
</tbody>
</table>

In addition to the monthly process, constituents are monitored for potential anomalies and trading disruptions. Out-of-review monitoring, which would require an Index modification, only applies in extraordinary circumstances. Incident types that would require one or more Index modifications are outlined in the CoinDesk Digital Asset Indices Policy Methodology.

**Deletions**

If a constituent is removed from an Index outside of the scheduled reconstitution process, its weight will be set to zero on the effective date of removal and it will no longer contribute to Index returns. The impacted constituent will be considered for inclusion at future reconstitutions if it meets the Eligibility and Selection Criteria.

**Additions**

There will be no additions to the Index between reconstitutions.
DACS reclassifications

In the event a constituent’s DACS classification is modified between reconstitutions, no changes will be made to its Index membership until the next reconstitution.

Data Distribution

Real-time Index values are calculated 24x7 at 5 second intervals and are available publicly at https://coindesk.com/indices/ and are also available to subscribers via REST, WebSocket APIs, and scheduled email updates.

Index Governance

The CoinDesk Index Committee provides ongoing oversight of the Index and its Methodology. For more details on the Index Committee, please refer to the Index Governance section of the CoinDesk Digital Asset Indices Policy Methodology.
Appendix 1: Data sources

This section describes data sources used to maintain, reconstitute, and calculate the Indices since the initial base date. For details of data sources prior to the base date, please see the CMI Family Backcast Appendix. If data is not available for any reason from the sources described in this appendix, other data sources may be used.

Reconstitution data

Market capitalization and circulating supply data are provided by CoinMarketCap.com. Notional volume is sourced from Eligible Exchanges.
Appendix 2: CMI Family Backcast Methodology

Overview

In April 2023, CDI completed a backcast of the CoinDesk Market Index family to extend history prior to the launch date of August 29, 2022 for all indices except USCE. History for the indices was extended as far back as December 29, 2017 if constituents were available. Table 1 provides the first value date for each index that was backcasted. The sections below provide a summary of the methodology used to backcast the indices.

Eligibility Requirements

To be eligible for the backcast, a digital asset must meet the following requirements:
Be a constituent of CMIP as of August 29, 2022.

Have readily available prices in Amberdata's historical spot price endpoint for the USD pair endpoint as of the reconstitution reference date.

Have circulating supply available from Amberdata’s historical supply endpoints of the reconstitution reference rate.

See Table 2 for additional eligibility requirements for each individual CMI Index.

Selection

Digital assets that meet all eligibility requirements were included in the index.

Constituent Pricing

Digital asset pricing was sourced from Amberdata’s historical spot price pairs endpoint. For more information on Amberdata’s pricing methodology, please visit https://www.amberdata.io/.

Circulating Supply

Circulating Supply was sourced from Amberdata’s historical supply endpoint and updated monthly. Supplies were pulled from the last calendar day of each month and implemented in the following month’s reconstitution. For more information on Amberdata’s circulating supply methodology, please visit https://www.amberdata.io/.

Reconstitution

Indices were reconstituted each month and implemented at 4p.m. Eastern Time on the 2nd business day of the month. The reference date for data is the last calendar day of the prior month.
Minimum constituent count

An index will be calculated for any period where one or more constituents were selected.

Calculation Frequency

Index levels during the backcast were calculated on an hourly basis.

Data Integrity

Historical supply and pricing data from Amberdata were reviewed by CDI’s research and operations teams to identify and resolve gaps or inconsistencies in circulating supply and price data.

Initial Inclusion Date

For each eligible digital asset, CDI assigned an initial inclusion date for the backcast based on the following steps:

  Step 1: Determine the latest date during the backcast period where the digital asset experienced no extended gaps in pricing and had a valid circulating supply.
  Step 2: Assign the initial inclusion date for the digital asset as the reconstitution date immediately following the date in Step 1 assuming it met all other eligibility and selection requirements.
Appendix 3: Methodology Changes

The table below provides a summary of methodology changes, if any, to this Index Methodology.

<table>
<thead>
<tr>
<th>Effective Date</th>
<th>Prior Treatment</th>
<th>Updated Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/21/2022</td>
<td>CoinDesk Market and CoinDesk Currency indices include stablecoins.</td>
<td>CoinDesk Market (CMI) and CoinDesk Currency (CCY) Indices exclude stablecoins. This was achieved via ticker and names changes: Old Ticker: CMI New Ticker: CMIP Old Name: CoinDesk Market Index New Name: CoinDesk Market Plus Stablecoin Index Old Ticker: CMIX New Ticker: CMI Old Name: CoinDesk Market Ex Stablecoin Index New Name: CoinDesk Market Index Old Ticker: CCX New Ticker: CCY Old Name: CoinDesk Currency Ex Stablecoin Index New Name: CoinDesk Currency Index Legacy CCY index is discontinued, and users can point to CCY new as a replacement.</td>
</tr>
<tr>
<td>11/02/2022</td>
<td>Weighting reference date used to determine circulating supply is two business days prior to the reconstitution effective date.</td>
<td>Weighing reference date used to determine circulating supply is seven calendar days prior to the reconstitution effective date.</td>
</tr>
</tbody>
</table>
# Appendix 4: Document Revision History

<table>
<thead>
<tr>
<th>Timing</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/5/2023</td>
<td>CMI Backcast completed and CMI Family Backcast Methodology Appendix inserted. Included first value dates in the Table of Indices.</td>
</tr>
<tr>
<td>12/19/2022</td>
<td>Updates to names and ticker - see Methodology Change Table</td>
</tr>
<tr>
<td></td>
<td>Addition of new indices: CSC and USCE</td>
</tr>
<tr>
<td>10/25/2022</td>
<td>Update to reconstitution weighting date</td>
</tr>
<tr>
<td>10/9/2022</td>
<td>Minor edits</td>
</tr>
<tr>
<td>9/23/2022</td>
<td>Initial Version</td>
</tr>
</tbody>
</table>
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