



# Compass Stablecoin Reference Indices

## Methodology

December 4<sup>th</sup>, 2024

## Version History

Readers can access versions of the methodology for the Compass Stablecoin Reference Indices online when they become available on Compass Financial Technologies website ([www.compass-ft.com](http://www.compass-ft.com)).

Date	Version	Change
29/08/2022	1.0	Methodology Publication
10/05/2024	1.1	Change of Data Source - Effective on May 10th 2024
04/12/2024	1.2	Add fallback process when there is no trade - Effective on December 6th 2024 for PAXG

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# 1 Introduction

The Compass Stablecoin Reference Indices (the *CSRI*, the *Indices* or the *Index*) measure hourly crypto exchange rates against US Dollars for the main cryptocurrencies considered as 'stablecoins'.

Stablecoins are cryptocurrencies that are pegged to another asset. It could be a fiat currency like EUR or US dollar, commodities like Gold or digital asset (mainly for blockchains interactions).

The Compass Stablecoin Reference Indices will be split into different categories representing each one a different type of asset.

Indices are computed hourly, every day of the year. They are calculated at the end of every hour and are published around 5 minutes after the end of the hour.

CSRI Indices can be accessed online on the Compass Financial Technologies website ([www.compass-ft.com](http://www.compass-ft.com)) or on Bloomberg or Refinitiv.

The Compass Stablecoin Reference Indices have been designed to provide institutional investors with independent and robust stablecoin reference prices. Based on a resilient and BMR compliant methodology, they serve as independent and transparent reference prices to value stablecoin portfolio or as benchmarks for investors willing to issue investment products tracking stablecoin prices.

Compass Stablecoin Reference Indices are owned by Compass Financial Technologies SA. The Index Administrator and Calculation Agent is Compass Financial Technologies (France).

As of December 4<sup>th</sup> 2024, Compass Stablecoin Reference Indices are provided for the following categories:

## **Compass Stablecoin Currency Reference Indices**

Compass Stablecoin Currency Reference Indices (the *CSCRI*) are part of a category of the Compass Stablecoin Reference Indices family that focuses on cryptocurrencies pegged to 'fiat currencies' (government-issued currencies).

## **Compass Stablecoin Commodity Reference Indices**

Compass Stablecoin Commodity Reference Indices (the *CSCRI*) are part of a category of the Compass Stablecoin Reference Indices family that focuses on cryptocurrencies pegged to commodities.

*CSRI* available as of December 4<sup>th</sup> 2024 are listed in the several tables of section 11.

## 2 Data Source

### 2.1 Data Provider

The daily price levels of the CSRI Indices are based on the historical tick-by-tick trades sourced directly from eligible exchanges.

### 2.2 Eligible Exchanges

The CSRI pricing methodology is performed through tracking a subset of exchanges. Eligible Exchanges must offer CryptoCurrency against USD markets and be approved by the Compass Stablecoin Reference Indices Steering Committee.

The current list of Eligible Exchanges used in CSRI calculations is composed of the following exchanges:

Eligible Exchanges
Bitstamp
Bitfinex
Coinbase
Gemini
Kraken
Lmax

Table 1: Compass Stablecoin Reference Indices Eligible Exchanges

### 3 Index Calculation

#### 3.1 Trading venues selection process

For each Compass Stablecoin Reference Index, a dynamic fully systematic algorithm selects among the list of eligible exchanges the trading venues which will contribute to the computation of the CSRI for the coming month.

On the last day of each month, for each stablecoin cryptocurrency  $c$ , the algorithm computes the last 60 days average volume for each eligible exchange where stablecoin cryptocurrency  $c$  is traded against USD. (For the avoidance of doubt, the last data used in the computation refer to the day preceding the last business day of the month).

The process keeps exchanges with a corresponding average volume representing at least 5% of the total aggregated volume over all eligible exchanges for  $c$ .

Only trades from the selected exchanges (the "Selected Exchanges") will be considered in the CSRI computation for the coming month.

#### 3.2 Calculation formula

Each day, Compass Stablecoin Reference Indices are calculated based on the collection of all observable transactions of all respective Selected Exchanges. The calculation methodology of the Compass Stablecoin Reference Index level for stablecoin cryptocurrency  $c$  on date  $t$  for the hour  $h_i$  follow the steps below:

1. For each Selected Exchange  $k_c$ , we create a dataset of all USD denominated trades occurring during the hourly time-period  $[h_{i-1}, h_i]$ .
2. Each dataset is divided in 12 time-equally sized partitions of trade records.
3. Volume-weighted median of trade prices are calculated for each partition and each Selected Exchange.
4. For each partition  $l$ , if the absolute percentage deviation of the Volume-weighted median price of a Selected Exchange from the median price computed on all Eligible Exchanges is above 5%, the data of that exchange is considered anomalous. The exchange is then excluded from the Selected Exchanges for this partition.
5. For each partition  $l$ , a Partition Reference Price  $P_{c,t,h_i,l}$  is computed as the exchange volume weighted average over partition  $l$  of the volume-weighted median prices computed in step above.
6. The final Compass Stablecoin Reference Index level is given by the arithmetic average of the computed Partition Reference Prices.

Given date  $t$ , stablecoin cryptocurrency  $c$ , partition  $l$  and time-period  $[h_{i-1}, h_i]$ , the Partition Reference Price  $P_{c,t,h_i,l}$  is expressed as:

$$P_{c,t,h_i,l} = \frac{\sum_{k=1}^{n_{c,t}} Volume_{c,t,h_i,l,k} \times vwmp_{c,t,h_i,l,k}}{\sum_{k=1}^{n_{c,t}} Volume_{c,t,h_i,l,k}} \quad (1)$$

Where,

- $n_{c,t}$  is the number of Selected Exchanges for stablecoin cryptocurrency  $c$  on date  $t$
- $Volume_{c,t,h_i,l,k}$  is the total volume traded of stablecoin cryptocurrency  $c$  against USD on date  $t$  during partition  $l$  on the Selected Exchange  $k$
- $vwmp_{c,t,h_i,l,k}$  is the volume-weighted median price of partition  $l$  on  $t$  for stablecoin cryptocurrency  $c$ , using all the trades on Selected Exchange  $k$ . It is equal to the price of trade pair  $m$  in partition  $l$ ,  $P_{c,t,h_i,l,k}$ , that satisfies:

$$\sum_{j=1}^{m-1} Volume_{c,t,h_i,k,j} \leq \frac{\sum_{j=1}^{N_l} Volume_{c,t,h_i,k,j}}{2} \quad \text{and} \quad \sum_{j=m+1}^{N_l} Volume_{c,t,h_i,k,j} < \frac{\sum_{j=1}^{N_l} Volume_{c,t,h_i,k,j}}{2} \quad (2)$$

- $N_l$  in (2) is the number of executed trades in partition  $l$

Then the Compass Stablecoin Reference Index level for stablecoin cryptocurrency  $c$  for fixing  $h_i$  on  $t$  is computed as:

$$CSRI_{t,h_i,c} = \frac{\sum_{l=1}^{12} P_{c,t,h_i,l}}{12} \quad (3)$$

***Fallback in case of no trade during a partition***

If there are no trades during a partition on all Selected Exchanges, the relevant Partition Reference Price will be computed as the average of all Selected Exchanges latest mid price in this interval. Each mid price is computed using the average of the best bid and best ask price from the last orderbook snapshot during the partition for the relevant Selected Exchange.<sup>1</sup>

### 3.3 Data Filters - Clean Data

Data is identified as erroneous and therefore discarded when reported in the wrong format (trade price or trade size that are non-numeric, non-positive, or in a format that deviates from the expected one).

### 3.4 Delayed and Missing Data

The transactions that cannot be retrieved by the Index calculation time are disregarded. If, for any stablecoin cryptocurrency, no transactions occur or can be retrieved for any exchange on a specific partition, this exchange is disregarded for the calculation of the affected Indices on that day for the specific hour. Any delay or absence of trade data is reported to the Compass Stablecoin Reference Indices Steering Committee and the selected course of action is formally announced.

### 3.5 Exceptional Circumstances

The calculation of the Compass Stablecoin Reference Indices is obstructed when there are no reported transactions or all transactions are rejected as suspicious on all of the Selected Exchanges, or when no data is provided from the data provider, or due to any other unforeseen events.

In the event of failure of the data provider to deliver relevant data, the Compass Stablecoin Reference Indices Steering Committee will do its best effort to determine relevant stablecoin cryptocurrency prices from alternative providers that are readily available.

In this scenario, Indices levels will be based on the stablecoin cryptocurrency price determined by the Compass Stablecoin Reference Indices Steering Committee.

If, for any stablecoin cryptocurrency, no transactions occur or can be retrieved for more than 3 consecutive business days, a Compass Stablecoin Reference Indices Steering Committee meeting will be called to determine the most appropriate action.

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<sup>1</sup>As of December 6th, the fallback process is only used for CSCRI-PAXG

### **3.6 Rounding of Data**

Indices values are computed with all decimals available and are published according to rounding policy defined in tables of section 11.

### **3.7 Calculation Frequency and Dissemination**

The Compass Stablecoin Reference Indices are computed hourly, every day of the year. They are calculated at the end of every hour and are published 15 minutes after the end of the hour.

Indices levels are published on the Compass Financial Technologies website ([www.compass-ft.com](http://www.compass-ft.com)) and are distributed to Bloomberg and Refinitiv under the ticker symbols listed in tables of section 11.



## 4 Index Governance

### 4.1 Index Administrator

Compass Financial Technologies (France) is the Administrator of the Index ("the Index Administrator"). The Index Administrator is responsible for the day-to-day management of the Index and is also responsible for decisions regarding the interpretation of these rules.

### 4.2 Index Calculation Agent

Compass Financial Technologies (France) is the Calculation Agent of the Compass Stablecoin Reference Indices. It is responsible for the day-to-day management of Indices computation according to this methodology.

### 4.3 Index Committees – Supervisor

Compass Financial Technologies has established governance functions to review and provide challenges on all aspects of the Indices determination process. Governance functions are managed by the Compass Oversight Committee and by the Compass Stablecoin Reference Indices Steering Committee.

#### **Compass Oversight Committee:**

The Compass Oversight Committee oversees all areas of the benchmark determination processes. It is responsible for supervising and controlling the Index operations team on all Compass Indices. It is also responsible for:

1. Periodic review of incidents
2. Making final decisions in case the Index operations team are not capable or allowed to take decisions
3. Defining and implementing organisation procedures for the Index operations team
4. Defining and overseeing measures that allow for mitigation of operational risks
5. Supervising internal or external audit results
6. The implementation and supervision of the potential codes of conduct that have to be implemented

The Committee is comprised of senior representatives of Compass Financial Technologies and external industry experts.

#### **Compass Stablecoin Reference Indices Steering Committee:**

The Compass Stablecoin Reference Indices Steering Committee is responsible for:

1. Determining the calculation methodology and the rules governing the publication of the Compass Stablecoin Reference Indices
2. Making periodic reviews of the Compass Stablecoin Reference Indices to validate the robustness of the methodology and to analyse the impact of methodology changes
3. Organising consultation with Compass Stablecoin Reference Indices stakeholders if necessary
4. Ensuring that Compass Stablecoin Reference Indices offers a reliable and representative view of the market

The Compass Stablecoin Reference Indices Steering Committee is composed of members from Compass and may include individuals or representatives of companies, academics, external counsels, or market participants. The Compass Stablecoin Reference Indices Steering Committee assembles once a year in April. However, at the request of a member of the committee, the Committee may meet on any other day of the year to discuss potential "market emergency" and "force majeure" events or any other situation, which makes an extraordinary meeting necessary.

All Committee decisions will be published without delay following the Committee decision.

The Compass Stablecoin Reference Indices Steering Committee members as of August 2022 are:

- Edouard Mouton, Compass Financial Technologies
- Guillaume Le Fur, Compass Financial Technologies
- Laurence Black, The Index Standard
- Michael Petch, Independent

As of May 10<sup>th</sup>, 2024, Edouard Mouton chairs the Compass Stablecoin Reference Indices Steering Committee.

## 5 Methodology Changes - Maintenance

This methodology may be supplemented, amended in whole or in part, revised or withdrawn at any time. Supplements, amendments, revisions and withdrawals may also lead to changes in the way the Index is compiled or calculated or affect the Index in another way.

In the absence of exceptional circumstances affecting the Index calculation or methodology, this Methodology is reviewed annually. The review will include, inter alia, the following points:

1. Verify if the methodology and computation are still in line with the original purpose of the Indices
2. Make sure the quality and quantity of the input data remain sufficient

Changes made to this methodology are published after the review date and implemented on a reasonable time horizon.

Compass Financial Technologies may terminate a Compass Stablecoin Reference Index due to certain extraordinary market circumstances. These circumstances include, but are not limited to:

1. The liquidity in one of the underlying cryptocurrencies of a Compass Stablecoin Reference Index declines and becomes not sufficient enough to provide an efficient market
2. The underlying cryptocurrency of a Compass Stablecoin Reference Index experiences a contentious hard fork in which both forks survive

Changes or termination will be subject to the review and approval of the Compass Stablecoin Reference Indices Steering Committee which will receive all the information related to the change or termination. In case of material changes, a notice will be provided at least two weeks in advance.

The results of the Compass Stablecoin Reference Indices Steering Committee will be published in a press release on Compass Financial Technologies website and distributed timely to data vendors and major news sources.

## 6 Expert Judgment

The Compass Stablecoin Reference Indices are based on written and transparent rules and procedures with the purpose of minimising as much as possible the exercise of discretion and expert judgment.

The Compass Stablecoin Reference Indices are built from input data that are not interpolated, extrapolated or adjusted. In case of lack of data, the last available data is employed.

Nevertheless, the exercise of expert judgment may become necessary in case of errors and Index restatements, delayed and missing data, hard forks, airdrops, or unexpected situations arising from market stress.

In the event that expert judgment is exercised, this will be done by resorting to the written procedures reported in the methodology and by communicating the decisions taken to the Compass Stablecoin Reference Indices Steering Committee and the Internal Compliance Function in order to prevent conflicts of interest and to protect the integrity and the independence of the Index determinations. In addition, the interest of the Index users and the market integrity will be taken into account.

## 7 Errors and Recalculations

Even though the process of Index calculation is completely automated and pre-defined, an error can be discovered after the publication of the Index.

In case of a material error the Index will be redetermined, and the Index clients will be notified about the error and the date of the publication of the redetermined Index. An error is considered material on the basis of its size, the dates of its discovery and of its occurrence, and the impact of the Index redetermination on the users. The discovery of any error is reported to Compass Stablecoin Reference Indices Steering Committee.

In case a material error is discovered and the Administrator recognises a manipulation or an attempted manipulation of the Index level or the input data it will be reported to the regulator.

## 8 Potential Limitations

The issues presented in the following non-exhaustive list may limit the ability of some of the Indices to represent the market they are intended to measure, the ease of replication by investors, and more generally the usefulness of the Indices to users.

- The market the Index is meant to measure is volatile. In particular, cryptocurrencies may be subject to market movements much more than traditional asset classes such as stocks and bonds as a consequence of illiquidity, market trends and changes to market structure.
- The input data provider may fail to provide accurate and timely data.
- Cryptocurrency prices are derived from several trading venues, each of which is characterised by a different market structure and the price of a cryptocurrency may sometimes be different across different trading venues. In addition, cryptocurrency exchanges may suffer problems that usually do not affect regulated asset exchanges, such as distributed denial-of-service, trading halt, hacking of private keys, lack of standards comparable to those of regulated exchanges, rapidly evolving technology and uncertain legal frameworks. Finally, the publication of the Indices may cease. Should this occur, the regulation regarding user transitions will be followed, but the existence of a suitable substitute is not assured.

## 9 Cases not covered in rules

In cases which are not expressly covered in these rules, operational adjustments will take place along the lines of the aim of the index. Operational adjustments may also take place if, in the opinion of the Index Administrator, it is desirable to do so to maintain a fair and orderly market in derivatives on this index and/or this is in the best interests of the investors in products based on the Index and/or the proper functioning of the markets. The Index Administrator will report to the Supervisor if it took a decision about a case which is not specifically covered in the rules for comments and review.

## 10 Liability

The Index Administrator and the Supervisor are not liable for any losses resulting from supplementing, amending, revising or withdrawing the rules for the index. The Administrator will do everything within its power to ensure the accuracy of the composition, calculation, publication and adjustment of the Index in accordance with relevant rules. However, neither the Index Administrator, nor the Supervisor are liable for any inaccuracy in index composition, calculation and the publication of the Index, the information used for making adjustments to the Index and the actual adjustments. Furthermore, the Index Administrator and the Supervisor do not guarantee the continuity of the composition of the Index, the continuity of the method of calculation of the Index, the continuity of the dissemination of the index levels, and the continuity of the calculation of the Index.

## 11 Compass Stablecoin Reference Indices - Codes - Rounding

Compass Stablecoin Currency Reference Indices				
Index	Compass API Code	Bloomberg Code	Refinitiv Code	Round
Compass Stablecoin Currency Reference Index USD Coin	CSCRIUSDC	Coming Soon	.CSCRIUSDC	5
Compass Stablecoin Currency Reference Index USD Tether	CSCRIUSDT	Coming Soon	.CSCRIUSDT	5

Table 2: Compass Stablecoin Currency Reference Indices - Publication Codes and Rounding policy

Compass Stablecoin Commodity Reference Indices				
Index	Compass API Code	Bloomberg Code	Refinitiv Code	Round
Compass Stablecoin Commodity Reference Index PAX Gold	CSCRIPAXG	Coming Soon	.CSCRIPAXG	2

Table 3: Compass Stablecoin Commodity Reference Indices - Publication Codes and Rounding policy

## 12 Disclaimer

Nothing contained herein shall constitute or shall be deemed to constitute a financial, legal, tax or other advice of any kind, or a solicitation to purchase, sell or invest in any financial products or to engage in any financial strategy. Compass Financial Technologies SA or any of its affiliates (“Compass”) (i) does not guarantee the adequacy, the accuracy, the timeliness, the completeness, the evolution and/or the movements of its indices or any data included therein (the “Indices” or the “Index”), (ii) shall not have any liability for any errors, omissions, delays or interruptions therein and (iii) makes no warranty, express or implied, as to results to be obtained by owners of any securities, or by any other person or entity from the use of the Indices. Compass does not make any express or implied warranties, and expressly disclaims, all warranties of merchantability or fitness for a particular purpose or use with respect to the Indices. Without limiting any of the foregoing, in no event shall Compass have any liability for any lost profits or indirect, punitive, special or consequential damages or losses, even if notified of the possibility thereof.



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