

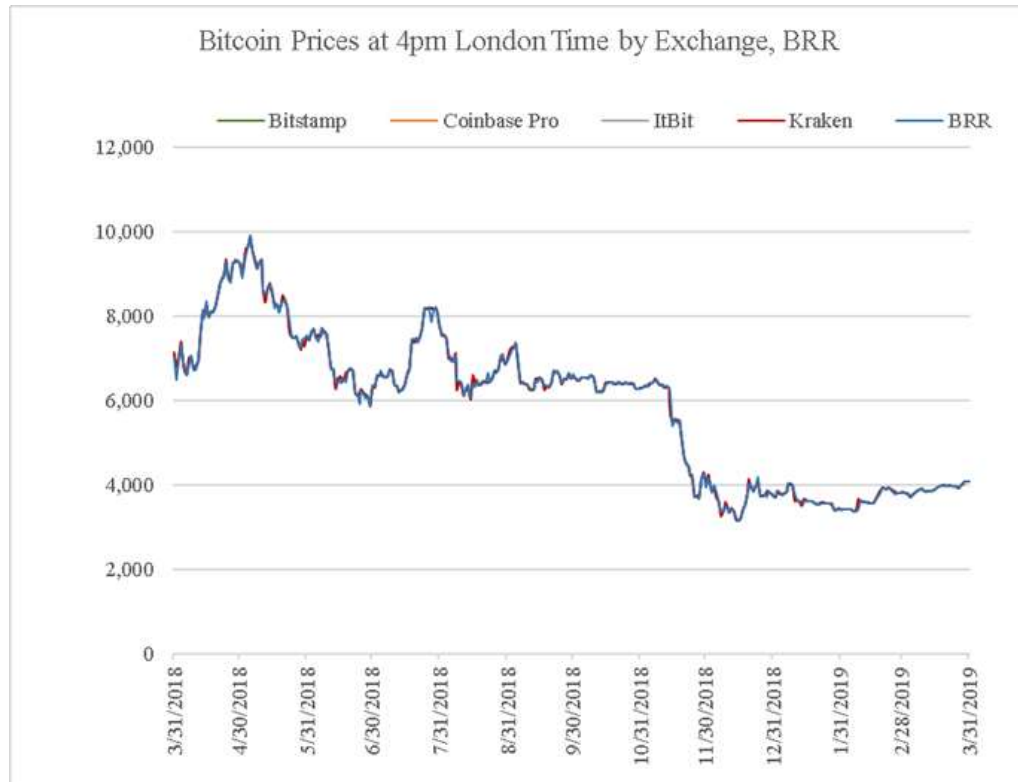
The Mathematical Representation of the CME CF BRR Methodology is represented below:

Symbol	Name	Description
T	Effective Time	Time at which the BRR is calculated
T	TWAP Period Length	Length of the Time Weighted Average Price (TWAP) period for which trade data is observed (60 minutes)
\hat{T}	Partition Length	Length of each partition (5 minutes)
x_i	Partition Trade	i^{th} price/size trade pair in partition
P_i	Partition Trade Price	i^{th} trade price in partition
s_i	Partition Trade Size	i^{th} trade size in partition
K	Number of Partitions	number of partitions – given by T/\hat{T}
k	Partition Number	k^{th} partition
WM_k	Weighted Median	Size-weighted median for the k^{th} partition
BRR_T	Bitcoin Reference Rate	BRR at time T

Figure 1: Calculation used to determine the CME CF BRR

$$\begin{aligned}
 WM_k = p_j \text{ where } x_j \text{ satisfies } \sum_{i=1}^{j-1} s_i < \frac{\sum_{i=1}^{I_k} s_i}{2} \text{ and } \sum_{i=j+1}^{I_k} s_i \leq \frac{\sum_{i=1}^{I_k} s_i}{2} \\
 \text{If } \sum_{i=j+1}^{I_k} s_i = \frac{\sum_{i=1}^{I_k} s_i}{2} \text{ then } WM_k = \frac{p_j + p_{j+1}}{2} \tag{1} \\
 BRR_T = \frac{\sum_{k=1}^K WM_k}{K}
 \end{aligned}$$

WM_k is thus calculated as the price (P_j) of the j^{th} trade where the j^{th} trade is the trade that lies at 50% of the cumulative size for the partition k . WM_k is calculated for each partition in T and the BRR is found to be the mean WM_k of all the K partitions.

Figure 2¹

¹ Analysis performed by the Sponsor using data provided by Kaiko//Challenger Deep.