

# A Primer: EBR and BBR

**MarketVector™ Bitcoin Benchmark Rate (BBR) and  
MarketVector™ Ethereum Benchmark Rate (EBR)**

## Contents

|  |   |
|--|---|
| A Primer: MarketVector™ Bitcoin Benchmark Rate (BBR) and MarketVector™ Ethereum Benchmark Rate (EBR) ..... | 3 |
| Case Study: Why a Single Token Index is Needed in the Digital Asset Universe.....                          | 4 |
| Contact.....   | 6 |
| IMPORTANT DEFINITIONS AND DISCLOSURES.....   | 7 |

## A Primer: MarketVector™ Bitcoin Benchmark Rate (BBR) and MarketVector™ Ethereum Benchmark Rate (EBR)

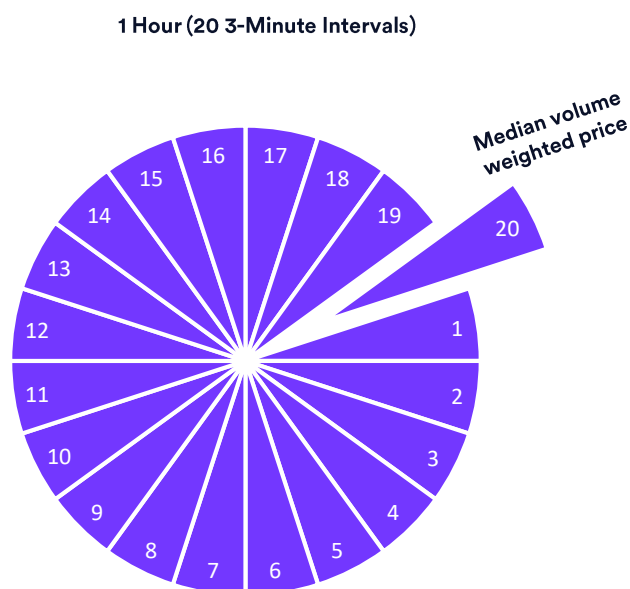
The MarketVector™ Bitcoin Benchmark Rate (BBR) and the MarketVector™ Ethereum Benchmark Rate (EBR) serve as a reference rate for funds, asset managers and exchanges who wish to build financial products, such as derivatives, funds and ETPs, on Ethereum and Bitcoin. The indexes aggregate transaction prices from the top five exchanges, selected via the CryptoCompare Exchange Benchmark, and disseminates in real-time.

The indexes use prices from top-tier ranked exchanges based on qualitative and quantitative metrics. Exchanges are ranked on the basis of their operational transparency, security, operational quality, regulatory standing, data provision, management team and ability to monitor trades and illicit activity effectively. Focusing on the top five ensures investor safety is at the forefront, and that only prices from platforms that behave in a manner conducive to maintaining efficient and fair markets are considered.

The indexes are based on an average of quantity-weighted median prices. To be precise, trade data from all eligible exchanges is aggregated and categorized via timestamp from twenty 3-minute partitions of equal length. A volume weighted median is calculated for each 3-minute partition and the benchmark reference rate is the average of the 20 volume weighted medians. This procedure is calculated every 15 seconds for the last rolling 1-hour window.

### Exhibit 1: Pricing Methodology

- Establish 3 minutes interval median volume weighted prices based on data from the top 5 rated exchanges.
  - Calculate the average of the last 20 3-minute intervals.
  - Index-price is calculated & disseminated every 15 seconds on a rolling basis.
- Source: MarketVector Indexes™



A series of safeguards are also employed to remove any potential outliers to ensure the BBR/EBR remains robust and resilient. There could be a full exchange exclusion when the weighted median price of an exchange within the total index window deviates more than 10% from the median of the rest of the exchanges' median. Other parameters such as non-numerical price, volume or timestamp, late/delayed transactions are also monitored and excluded from the calculation process.

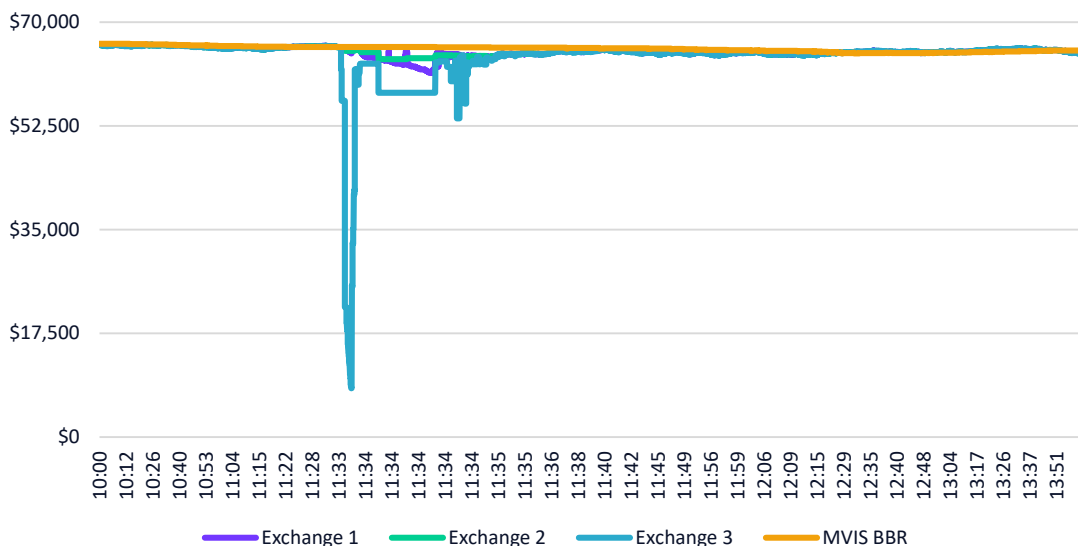
Its unique regulated status and the substantial liquidity makes it the ideal reference price for regulated financial products.

## Case Study: Why a Single Token Index is Needed in the Digital Asset Universe

While the cryptocurrency market infrastructure dramatically improved over the years, we find that prices are still strongly influenced by a small number of market events.

On Oct 21, 2021, a flash crash on one large exchange caused Bitcoin's price to plunge from 66k to 8k and bouncing back to 65k within seconds. This reportedly occurred due to a bug in the trading algorithm of a large institutional investor.

**Exhibit 2: Intraday Comparison of BBR vs. Large Cryptocurrency Exchanges**



Source: CryptoCompare, MarketVector Indexes™. Data as of October 21, 2021.

Our Index is a liquidity weighted tape. In this example, BBR is calculated as an average of 1-hour quantity weighted median prices, which are calculated for twenty 3-minute intervals. As you can see from Exhibit 2, the flash crash from Exchange 3 rippled throughout other Bitcoin markets, demonstrating how an exchange-specific glitch is never an isolated event. However, BBR wasn't affected at all. A few minutes later, all exchanges traded again in line with the BBR Index.

Indexes incorporating the BBR or EBR are specifically designed for highly regulated products. Especially if you need to value net asset values or provide pricing data for derivatives, a sound pricing methodology is critical.

The full methodology is available at [marketvector.com](https://www.marketvector.com)

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Martin Leinweber works as a Digital Asset Product Strategist at MarketVector Indexes™ providing thought leadership in an emerging asset class. His role encompasses product development, research and the communication with the client base of MarketVector Indexes™. Prior to joining MarketVector Indexes™, he worked as a portfolio manager for equities, fixed income and alternative investments for almost two decades. He was responsible for the management of active funds for institutional investors such as insurance companies, pension funds and sovereign wealth funds at the leading German quantitative asset manager Quoniam. Previously, he held various positions at one of Germany's largest asset managers, MEAG, the asset manager of Munich Re and ERGO. Among other things, he contributed his expertise and international experience to the establishment of a joint venture with the largest Chinese insurance company PICC in Shanghai and Beijing. Martin Leinweber is co-author of "Asset-Allokation mit Kryptoassets. Das Handbuch (Wiley Finance, 2021)". It's the first handbook about integrating digital assets into traditional portfolios. He has a Master in Economics from the University of Hohenheim and is a CFA Charter holder.

## IMPORTANT DEFINITIONS AND DISCLOSURES

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