



# EXCHANGE REVIEW

## FEBRUARY 2019



## Abstract

CryptoCompare's Exchange Review aims to capture the key developments within the cryptocurrency exchange market, as well as any changes to the constituent exchanges that make up CryptoCompare's CCCAGG price indices. Our review focuses on analyses that relate to exchange volumes, and includes an analysis of the highest volume producing jurisdictions, as well as market segmentation by exchange fee model.

We also evaluate how spot volumes vs futures volumes have developed historically to date, including both crypto exchange (BitMEX and BitflyerFX) and traditional exchange (CBOE and CME) futures volumes. Finally, we conduct an analysis of bitcoin trading into various fiats and stablecoins, as well as an overview of how exchange web traffic has changed over the previous few months.

We provide an additional overview of top crypto exchange rankings by spot trading volume, as well as a focus on how volumes have developed historically for the top trans-fee mining and decentralised exchanges.

CryptoCompare's Exchange Review is conducted on a monthly basis and caters to both the crypto-enthusiast interested in a broad overview of the crypto exchange market, as well as investors, analysts and regulators interested in more specific analyses.

For questions related to our research or any potential requests, feel free to contact our research department at [research@cryptocompare.com](mailto:research@cryptocompare.com)

For those interested in accessing CryptoCompare's data for their own purposes, whether it be cryptocurrency trade data, order book data, blockchain data, social data or historical data across thousands of cryptocurrencies and 200+ exchanges, please take a look at CryptoCompare's API here: <https://min-api.cryptocompare.com>

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# Executive Summary

## Macro Analysis and Market Segmentation

- 1 **Country Analysis** - Malta-registered exchanges represented the majority of trading volume, followed by those legally registered in Hong Kong and South Korea. Monthly trading volumes from Malta-registered exchanges increased 8% since January, while those of Hong Kong and South Korea-registered exchanges increased 12% and 6% respectively.
- 2 **Predominant Fee Type** - Exchanges that charge taker fees represented 84% of total exchange volume in February, while those that implement trans-fee mining (TFM) represented 14%. Fee-charging exchanges traded a total of 186 billion USD in February, while those that implement TFM traded 31.4 billion USD. The remaining volume represented trading by exchanges that charge no trading fees, at 3.1 billion USD.
- 3 **Futures Trading** – Total futures trading volume from exchanges bitFlyerFX and BitMEX totalled 54.8 billion USD in February, while volume from spot exchanges totalled 220 billion USD. Meanwhile, CME's average Bitcoin futures contract trading volumes increased from 79.9 million USD in January to 98.9 million USD in February while those of CBOE decreased from a daily average of 8.1 million USD to 5.6 million USD in February.

According to a mid-March volume snapshot, OKEx traded the highest daily derivatives volume (swaps and futures) at 1.76 billion USD, followed by BitflyerFX (1.15 billion USD) and BitMEX (708 million USD). Exchanges Deribit (67 million USD), CryptoFacilities (27 million USD), CME (61 million USD) and CBOE (13 million USD) still represented only a small proportion of this.

- 4 **Fiat Capabilities** – Trading volume from exchanges that offer fiat pairs did not change from January to February (63 billion USD), however that of crypto to crypto exchanges increased by 20% to 157 billion USD. Following this increase in crypto to crypto trading volume, fiat to crypto trading volume represented 29% of total spot volume, down from 33% in January.
- 5 **Web Traffic** - Total exchange web traffic continues its downward trend dropping 10%, while total monthly spot volumes increased 13% in February. According to calculations based on Alexa traffic data, total monthly unique visitors decreased from 10.4 million in January to 9.9 million in February.
- 6 **Bitcoin to Fiat Volumes** - In February, 46% of all Bitcoin trading into fiat was made up of the US Dollar, down from 48% in January. BTC to USD volumes decreased from 1.47 million BTC to 1.24 million BTC in February (-15.3%). Bitcoin trading into JPY formed 33% of Bitcoin into Fiat in February, up from 30% in January; volumes remained stable at ~0.9 million BTC. Meanwhile, BTC trading into EUR and KRW decreased by 22% and 14.6% respectively. In February, USD, JPY, EUR and KRW made up 95% of total trading from Bitcoin into fiat.
- 7 **Bitcoin to Stablecoin Volumes** - In February, BTC trading into USDT represented 70% of total volume (fiat or stable coin), totalling 6.24 million BTC. USDT continues to be the most popular stable coin followed by PAX, USDC and GUSD. USDT represents 98% of the total Bitcoin trading into these stablecoins.
- 8 **February Trade Snapshot Analysis** – Among a selection of top exchanges that trade BTC to USD, Coinbase traded the most at the end of February with over 40,000 trades in a day followed by Bitfinex (23,000) and Bitstamp (11,800). Among the above exchanges, Coinbase also traded the lowest average trade size at 600 USD while other exchanges (Bitfinex, Bitstamp, Kraken, itBit) traded between 1500-2600 USD.

On the other hand, top exchanges that trade BTC to USDT are far more active in terms of trades per day with OKEx handling over 227,000 trades, followed by Binance (209,000) and Bibox (112,000). Average trade sizes for these three exchanges ranged from 600-1000 USD, which is nearly 1000 USD lower than those of exchanges trading BTC to USD.

## Exchange Volumes

1. **Top Exchange Volumes** - Bithumb was the top exchange by total volume in February, followed by Binance and ZB. Bithumb's total trading volume in February was 26.8 billion USD (up 2.8% since January). Meanwhile, Binance traded a total of 18.9 billion USD (up 8%), followed by ZB at 18.1 billion USD (down 7.8%).

**Trading Competitions, Margin Trading and Trans-Fee Mining.** It can be seen that among the top exchanges by total volume, most exchanges have implemented some form of trading competition within the last 3 months. Many others offer margin trading, which allows users to trade with leveraged positions and thus higher trade quantities. Other exchanges, such as CoinBene and ZBG implement trans-fee mining structures.

2. **Trans-Fee Mining Exchanges** - CoinBene was the largest TFM exchange in February, followed by ZBG and EXX. CoinBene traded 11.4 billion USD in total volume in February, up 13% since January. ZBG traded 8.5 billion USD and EXX traded 4.2 billion USD, up 40% and down 23% since January respectively. CoinBene, ZBG, EXX and FCoin represented 90% of volume among the top 8 TFM exchanges.
3. **Decentralised Exchanges** - Ethereum was the largest DEX in February, followed by WavesDEX and OpenLedger. DEXs continue to represent only a small fraction of global spot exchange volume (0.17%), trading a monthly total of 365 million USD.

## February Exchange News

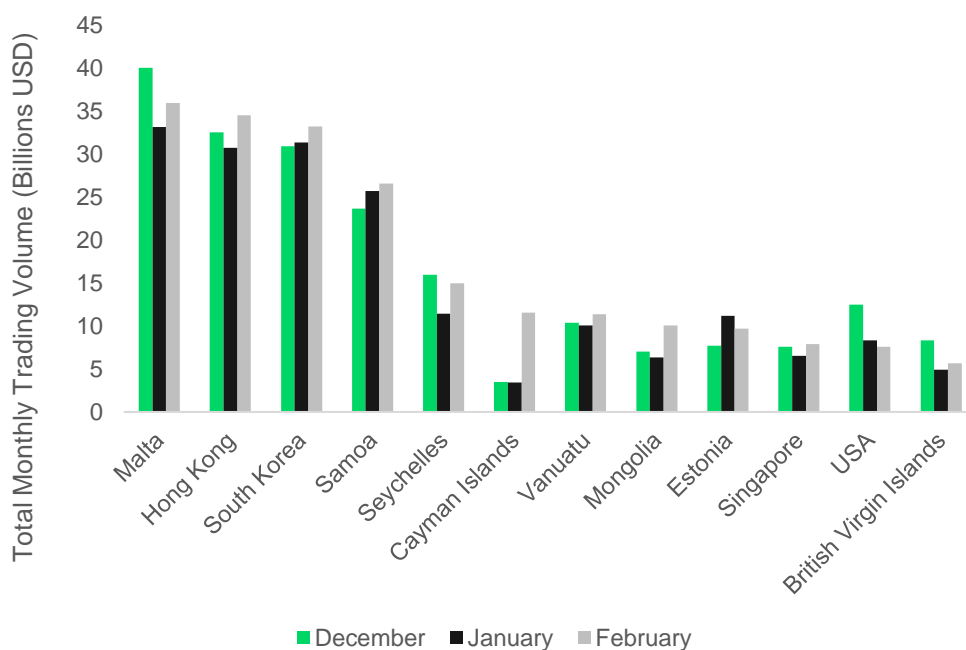
| EXCHANGE             | STORY   | DATE      |
|----------------------|---|-----------|
| BitMEX               | <a href="#">BitMEX Defends Insurance War Chest in Latest Research</a>   | 11-Feb-19 |
| Cryptopia            | <a href="#">Cryptopia: Authorities Allow Hacked Exchange to Reopen, but It's Still Down</a>                   | 13-Feb-19 |
| QuadrigoCX           | <a href="#">QuadrigoCX Runs out of Funds as Lawyers Pitch to Represent Its Creditors</a>                      | 15-Feb-19 |
| QuadrigoCX           | <a href="#">QuadrigoCX's Founder Could've Stored Users' Funds in Paper Wallets, Report Suggests</a>           | 16-Feb-19 |
| Coinsquare, StellarX | <a href="#">Digital Asset Marketplace StellarX Acquired by Leading Canadian Exchange Coinsquare</a>           | 16-Feb-19 |
| Kucoin               | <a href="#">KuCoin Shares Token Surges 13% as Exchange Announces 2.0 Upgrade</a>                              | 17-Feb-19 |
| Binance              | <a href="#">Binance Launches Public Testnet for Binance DEX, BNB Surges Over 12%</a>                          | 20-Feb-19 |
| Kucoin               | <a href="#">KuCoin Has Allegedly Given Tokens 'Volume-Boosting' Offers</a>                                    | 21-Feb-19 |
| QuadrigoCX           | <a href="#">QuadrigoCX Has Sent Its Remaining Crypto to 'Big Four' Ernst &amp; Young</a>                      | 22-Feb-19 |
| Coinbase             | <a href="#">XRP Finally Launching on Coinbase Pro with Three Trading Pairs: XRP/USD, XRP/EUR, and XRP/BTC</a> | 25-Feb-19 |
| Binance              | <a href="#">Binance Launchpad's Fetch.AI Token (FET) Sale Was Over in 'About 10 Seconds'</a>                  | 26-Feb-19 |

## Macro Analysis and Market Segmentation

This section aims to provide a macro view of the global cryptocurrency exchange market, with a focus on analyses that relate to exchange volumes. This will include an analysis of the highest volume producing jurisdictions, as well as market segmentation by exchange fee model. We also evaluate how spot volumes vs futures volumes have developed historically to date, including both crypto exchange (BitMEX and BitflyerFX) and traditional exchange (CBOE and CME) futures volumes. Finally, we conduct an analysis of bitcoin trading into various fiats and stablecoins, as well as an overview of how exchange web traffic has changed over the previous few months.

### 1 Country Analysis

Figure 1 - Historical Monthly Trading Volume by Jurisdiction - Top 10



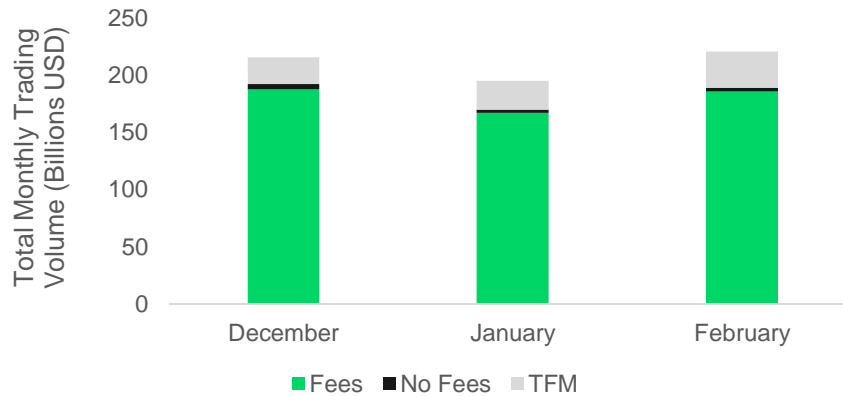
**Monthly trading volume from Malta-registered exchanges increased 8% since January, while that of Hong Kong and South Korea-registered exchanges increased 12% and 6% respectively.**

Maltese-registered exchanges represented the majority of trading volume in February (35.9 billion USD) as in previous months, followed closely by those legally registered in Hong Kong (34.5 billion USD) and South Korea (33.2 billion USD).

The increase in volume from exchanges registered in the Cayman Islands (239%) is accounted for by trans-fee mining exchange Bgogo (after its integration with CryptoCompare) and a significant increase in volume from crypto to crypto exchange BitMart.

## 2 Segmentation by Fee-Type

Figure 2 - Total Monthly Trading Volume by Predominant Fee Type

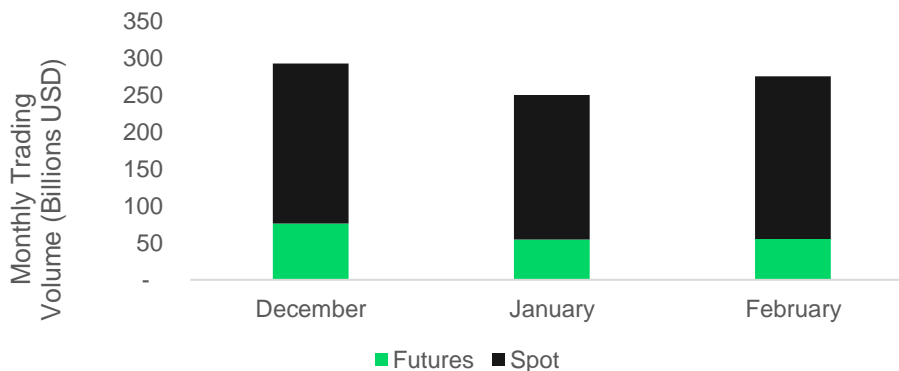


**Exchanges that charge taker fees represented 84% of total exchange volume in February, while those that implement trans-fee mining (TFM) represented 14%.**

Fee-charging exchanges traded a total of 186 billion USD in February, while those that implement TFM traded 31.4 billion USD. The remaining volume represented trading by exchanges that charge no trading fees, at 3.1 billion USD.

## 3 Segmentation by Product Type

Figure 3 - Historical Spot vs Futures Monthly Trading Volume



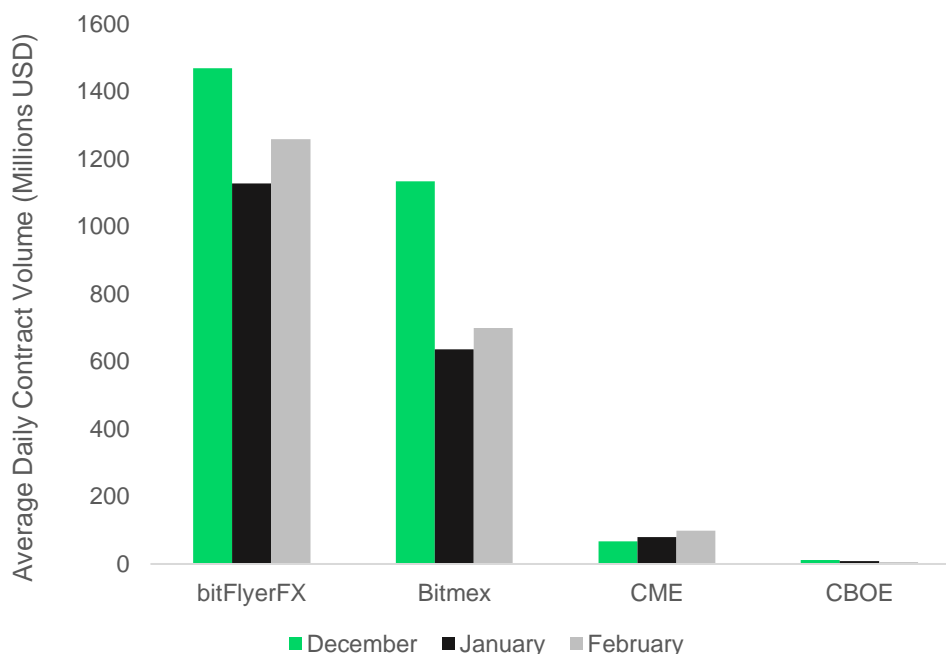
**Total futures trading volume<sup>1</sup> from exchanges bitFlyerFX and BitMEX totalled 54.8 billion USD in February, while volume from spot exchanges totalled 220 billion USD.**

Spot volumes increased 13%, from 195 billion USD in January to 220 billion USD in February. Meanwhile, futures volumes from bitFlyerFX and BitMEX combined remained similar to the previous month.

<sup>1</sup> bitFlyerFX (BTC-FX/JPY) and BitMEX (XBT/USD) contracts.

#### 4 Bitcoin Futures Trading: Cryptocurrency Exchanges Compared to Traditional Regulated Exchanges (CME and CBOE)

Figure 4 - Average Daily Bitcoin Futures Volumes



bitFlyerFX traded the highest amount of BTC futures volume<sup>2</sup> in February with a daily average transactional value of 1.26 billion USD (up 11% since January), followed by BitMEX perpetual futures<sup>3</sup> at 699 million USD (up 10% since January)

Meanwhile, the XBTUSD futures of traditional regulated exchanges CME and CBOE increased by 23% and fell by 32% respectively.

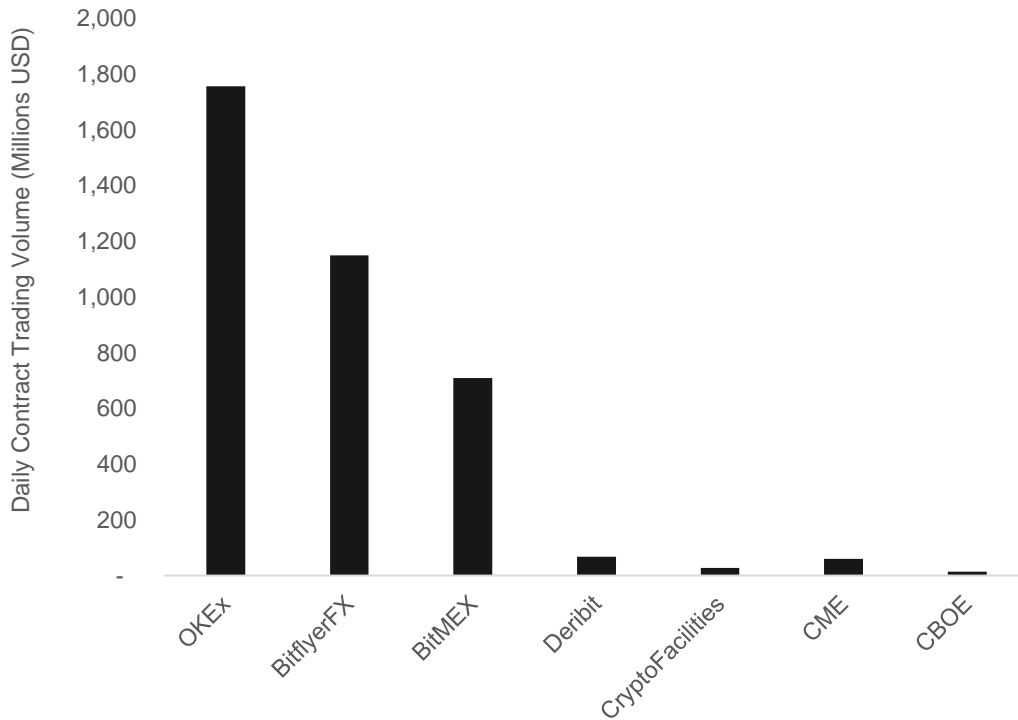
CME's average daily Bitcoin futures contract trading volumes increased from 79.9 million USD in January to 98.9 million USD in February. CBOE's Bitcoin futures volumes decreased from a daily average of 8.1 million USD to 5.6 million USD in February.

<sup>2</sup> BTC-FX/JPY perpetual futures

<sup>3</sup> XBT USD perpetual futures



Figure 5 – 24-Hour Snapshot of Derivatives Volumes (Mid-March 2019)

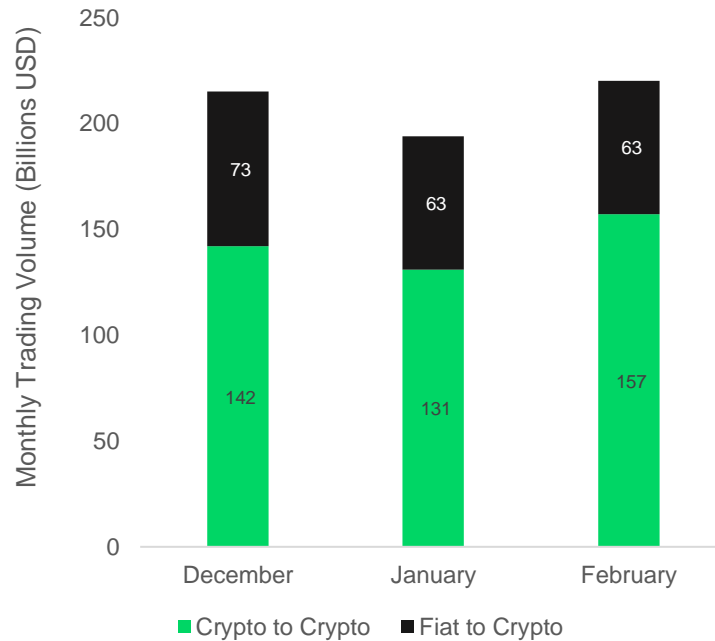


**According to a mid-March volume snapshot, OKEx traded the highest derivatives volume (swaps and futures) at 1.76 billion USD, followed by BitflyerFX (1.15 billion USD) and BitMEX (708 million USD).**

Exchanges Deribit (67 million USD), CryptoFacilities (27 million USD), CME (61 million USD) and CBOE (13 million USD) still represented only a small proportion of this.

## 5 Segmentation by Fiat Pair Trading Capability

Figure 6 - Monthly Total Volume: Crypto to Crypto vs Fiat to Crypto Exchanges

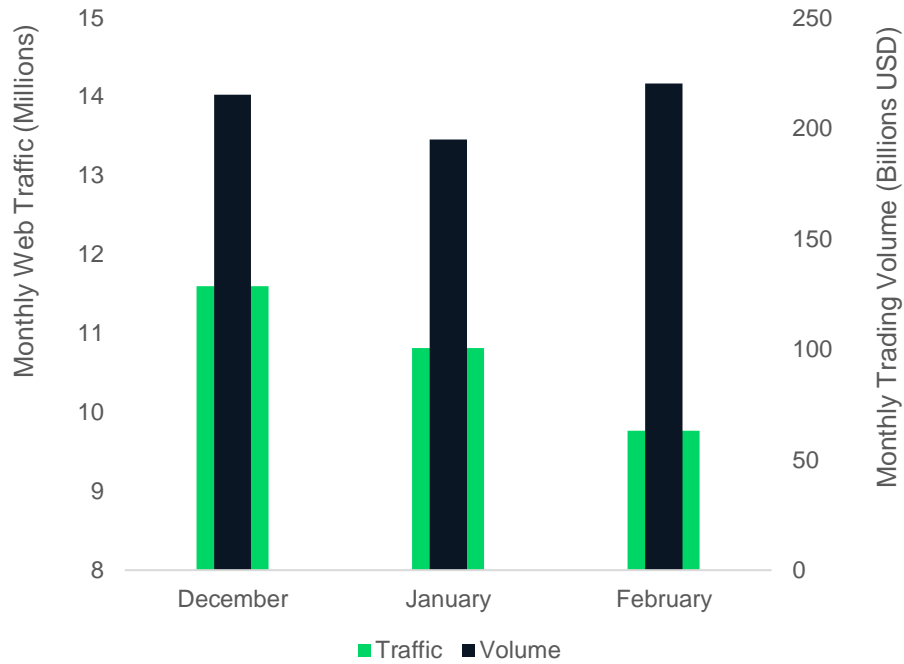


**Trading volume from exchanges that offer fiat pairs did not change significantly from January to February (63 billion USD), however that of crypto to crypto exchanges increased by 20% to 157 billion USD.**

Following this increase in crypto to crypto trading volume, fiat to crypto trading volume represented 29% of total spot volume, down from 33% in January.

## 6 Macro Web Traffic Statistics

Figure 7 - Historical Monthly Exchange Market Web Traffic vs Volume

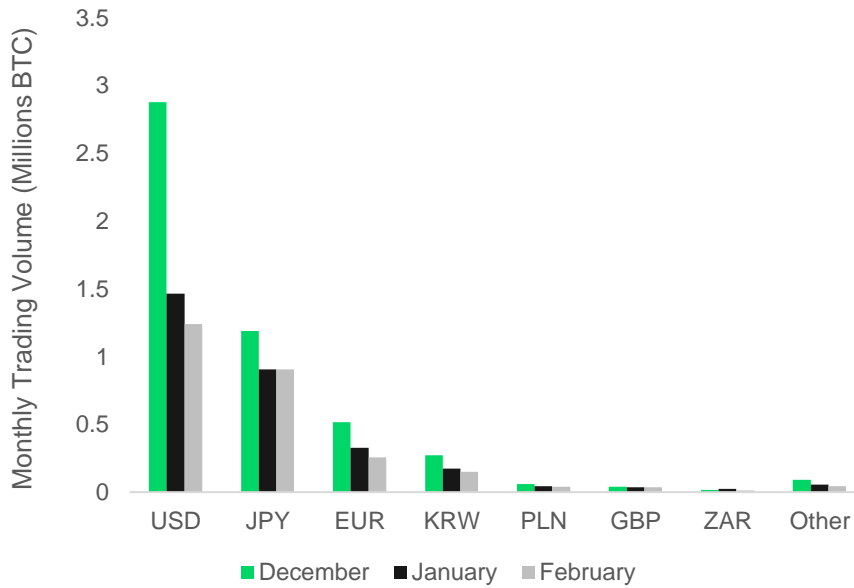


**Total exchange web traffic continues its downward trend dropping 10%, while total monthly spot volumes increased 13% in February.**

According to calculations based on Alexa traffic data, total monthly unique visitors decreased from 10.4 million in January to 9.9 million in February.

## 7 Bitcoin to Fiat Volumes

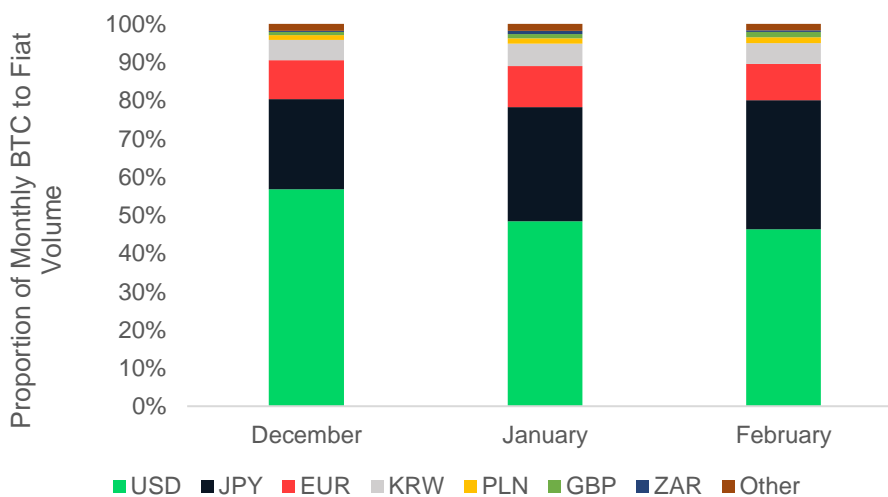
Figure 8 - Historical Monthly Bitcoin Trading Volume into Fiat



**In February, 46% of all Bitcoin trading into fiat was made up of the US Dollar, down from 48% in January. BTC to USD volumes decreased from 1.47 million BTC to 1.24 million BTC in February (-15.3%).**

Bitcoin trading into JPY formed 33% of Bitcoin into Fiat in February, up from 30% in January. Volumes remained stable at ~0.9 million BTC. Meanwhile, BTC trading into EUR and KRW decreased by 22% and 14.6% respectively.

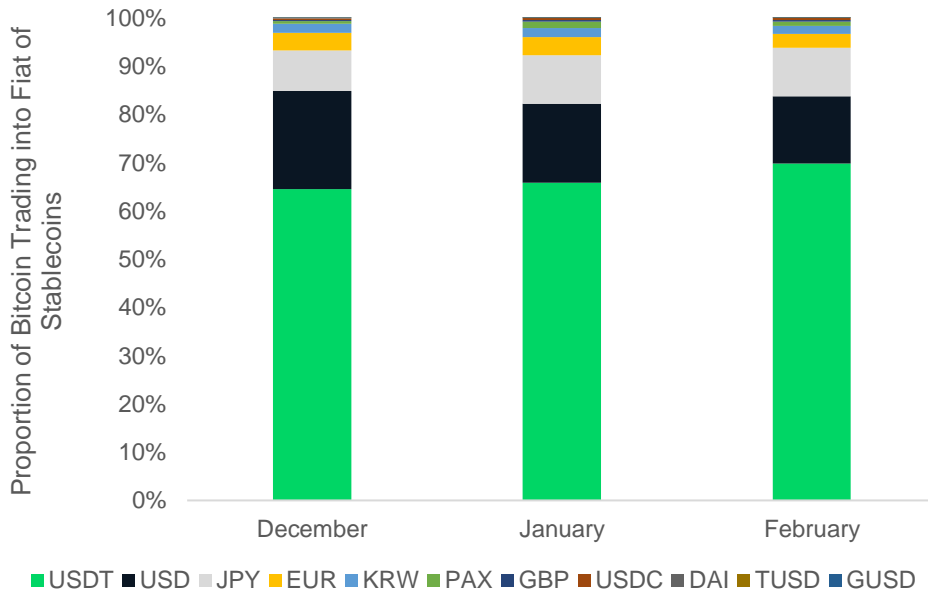
Figure 9 - Monthly Proportion of Bitcoin Trading into Fiat



In February, USD, JPY, EUR and KRW made up 95% of total trading from Bitcoin into fiat.

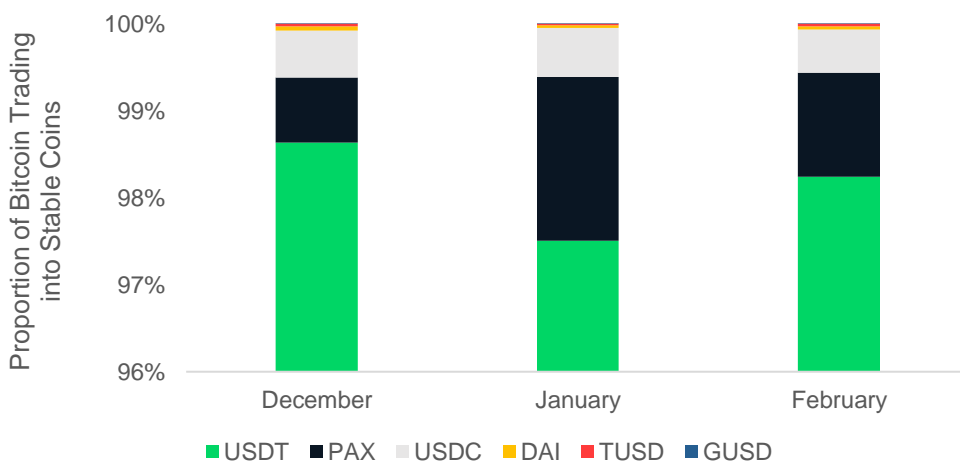
## 8 Bitcoin to Stable Coin Volumes

Figure 10 - Proportion of Bitcoin trading into Fiat or Stablecoins (USDT)



**In February, BTC trading into USDT represented 70% of total volume (fiat or stable coin), totalling 6.24 million BTC.**

Figure 11 - Proportion of BTC Trading into Top Stablecoins

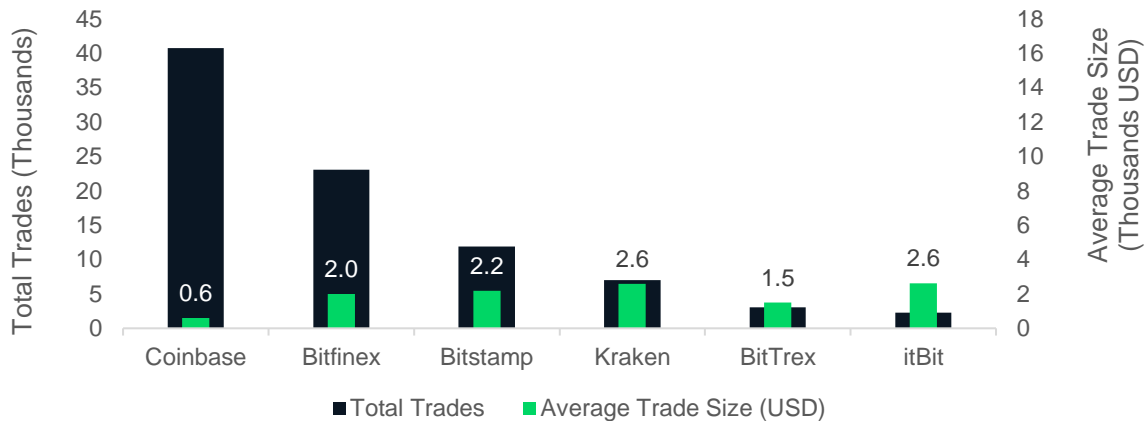


**USDT continues to be the most popular stable coin for trading with Bitcoin, followed by PAX, USDC and GUSD**

USDT represents 98% of the total Bitcoin trading into these four coins.

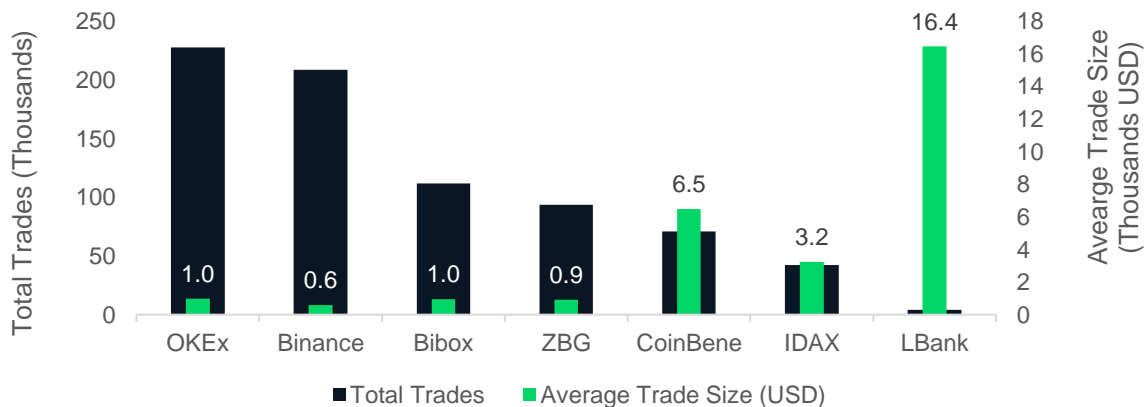
## February Trade Data Snapshot Analysis

Figure 12 - End of February 24-Hour Trade Snapshot – BTC to USD Markets



Among the top exchanges that trade BTC to USD, Coinbase traded the most at the end of February with over 40,000 trades in a day followed by Bitfinex (23,000) and Bitstamp (11,800). Among the above exchanges, Coinbase also traded the lowest average trade size at 600 USD while other exchanges trades between 1500-2600 USD.

Figure 13 - End of February 24-Hour Trade Snapshot – BTC to USDT markets

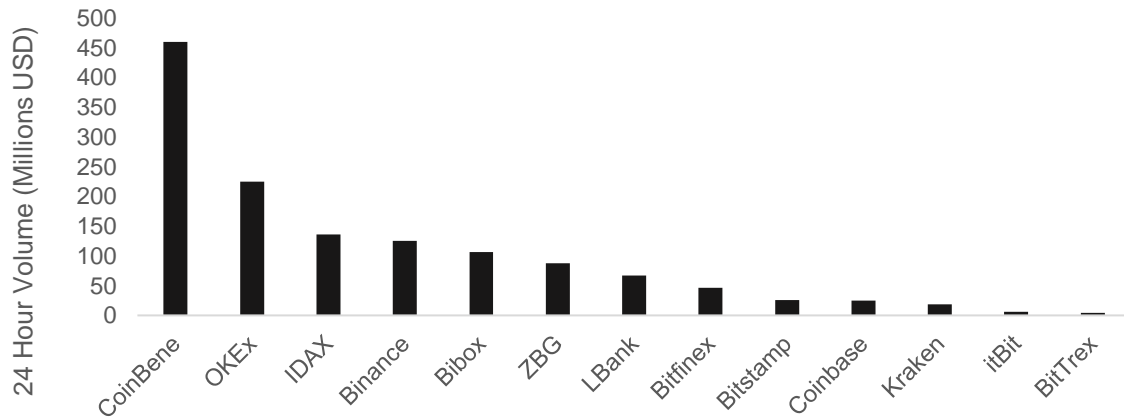


On the other hand, top exchanges that trade BTC to USDT are far more active in terms of trades per day with OKEx handling over 227,000 trades, followed by Binance (209,000) and Bibox (112,000). Average trade sizes for these three exchanges ranged from 600-1000 USD, which is nearly 1000 USD lower than those of exchanges trading BTC to USD.

Other crypto to crypto exchanges CoinBene, IDAX and LBank traded significantly higher average trade values at 6500, 3200 and 16400 USD respectively. The most notable exchange is LBank, who handled much lower number of trades (~4000) combined with a markedly higher average trade size (\$16400). More analysis moving forward is necessary to declare whether this is suspicious activity.

In general, higher average trade sizes on fiat exchanges might reflect the characteristics of the clientele that the exchange attracts, such as professional and institutional traders, whereas exchanges such as OKEx, Binance and Bibox may be more retail focused.

Figure 14 - Total 24-Hour Volume (BTC to USD or USDT markets) - End of February



## Exchange Volume Rankings

Table 1 - Top 10 Crypto to Crypto Exchanges by Average Daily Volume in February

|          | AVG DAILY VOLUME (USD) | TOTAL MONTHLY VOLUME (USD) | PAIRS | COINS | MONTHLY WEB TRAFFIC | LEGAL JURISDICTION |
|----------|------------------------|----------------------------|-------|-------|---------------------|--------------------|
| Binance  | 676,989,129            | 18,955,695,609             | 484   | 171   | 1,756,190           | Malta              |
| ZB       | 646,123,786            | 18,091,465,999             | 170   | 58    | 26,832              | Samoa              |
| OKEX     | 601,233,210            | 16,834,529,867             | 575   | 198   | 331,307             | Malta              |
| LBank    | 424,432,937            | 11,884,122,240             | 133   | 91    | 114,758             | Hong Kong          |
| CoinBene | 406,639,905            | 11,385,917,326             | 216   | 184   | 41,785              | Vanuatu            |
| IDAX     | 358,942,733            | 10,050,396,524             | 165   | 96    | 841                 | Mongolia           |
| HitBTC   | 328,160,264            | 9,188,487,385              | 978   | 474   | 259,055             | Hong Kong          |
| Bibox    | 317,452,048            | 8,888,657,356              | 234   | 96    | 346,707             | Estonia            |
| ZBG      | 303,381,994            | 8,494,695,834              | 15    | 15    | 210,229             | Samoa              |
| HuobiPro | 280,266,778            | 7,847,469,777              | 331   | 143   | 103,230             | Seychelles         |

Table 2 - Top 10 Fiat to Crypto Exchanges by Average Daily Volume in February

|          | AVG DAILY VOLUME (USD) | TOTAL MONTHLY VOLUME (USD) | PAIRS | COINS | MONTHLY WEB TRAFFIC | DOMINANT FIAT CURRENCY | LEGAL JURISDICTION |
|----------|------------------------|----------------------------|-------|-------|---------------------|------------------------|--------------------|
| Bithumb  | 957,623,629            | 26,813,461,616             | 57    | 57    | 155,617             | KRW                    | South Korea        |
| Upbit    | 204,371,943            | 5,722,414,393              | 341   | 182   | 254,773             | KRW                    | South Korea        |
| Bitfinex | 156,009,949            | 4,368,278,566              | 324   | 118   | 261,017             | USD                    | BVI                |
| Liquid   | 104,642,268            | 2,929,983,492              | 274   | 94    | 73,163              | JPY                    | Singapore          |
| Kraken   | 78,219,061             | 2,190,133,721              | 98    | 26    | 181,020             | USD                    | USA                |
| Coinbase | 74,029,721             | 2,072,832,193              | 40    | 16    | 1,405,321           | USD                    | USA                |
| Simex    | 59,327,509             | 1,661,170,254              | 26    | 17    | 6,130               | USD                    | USA                |
| Bitstamp | 52,775,044             | 1,477,701,222              | 18    | 7     | 139,785             | USD                    | Luxembourg         |
| STEX     | 23,735,488             | 664,593,676                | 155   | 99    | 2,482               | USD                    | UK                 |
| BitBank  | 19,639,209             | 549,897,854                | 8     | 6     | 202,462             | JPY                    | Japan              |

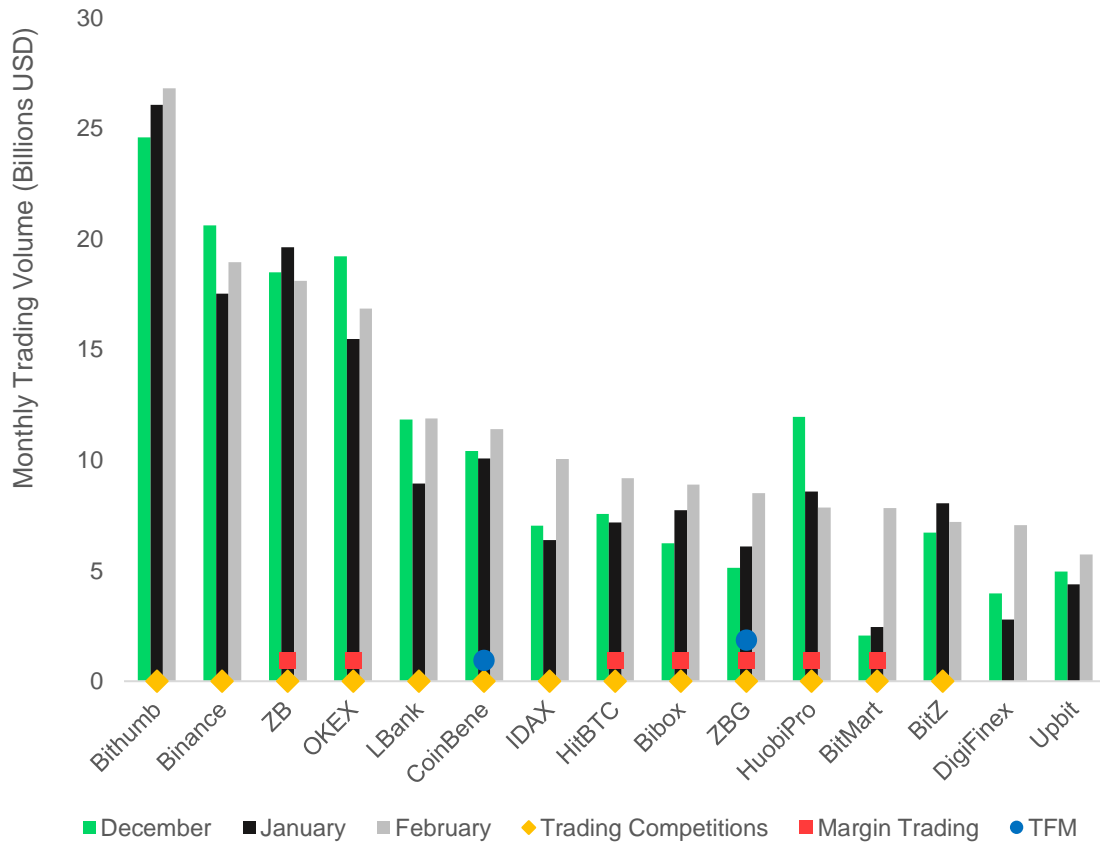
Table 3 - Top 10 Exchanges by Number of Historical Pairs in February

|              | AVG DAILY VOLUME (USD) | TOTAL MONTHLY VOLUME (USD) | PAIRS | COINS | MONTHLY WEB TRAFFIC |
|--------------|------------------------|----------------------------|-------|-------|---------------------|
| Yobit        | 10,128,550             | 283,599,401                | 7,356 | 1,242 | 89,700              |
| CCEX         | 4,400                  | 123,205                    | 2,132 | 626   | 10,015              |
| EtherDelta   | 16,261                 | 455,301                    | 2,058 | 2,057 | 24,558              |
| TradeSatoshi | 229,448                | 6,424,545                  | 1,094 | 242   | 58,306              |
| HitBTC       | 328,160,264            | 9,188,487,385              | 978   | 474   | 259,055             |
| BitTrex      | 22,492,780             | 629,797,838                | 658   | 523   | 314,345             |
| IDEX         | 735,433                | 20,592,131                 | 641   | 638   | 50,097              |
| LiveCoin     | 11,487,583             | 321,652,333                | 617   | 260   | 46,927              |
| WavesDEX     | 2,464,055              | 68,993,546                 | 600   | 164   | 65,555              |
| OKEX         | 601,233,210            | 16,834,529,867             | 575   | 198   | 331,307             |



# 1 Top Exchanges by Total Monthly Volume

Figure 15 - Historical Monthly Volume - Top Exchanges



**Bithumb was the top exchange by total volume in February, followed by Binance and ZB.**

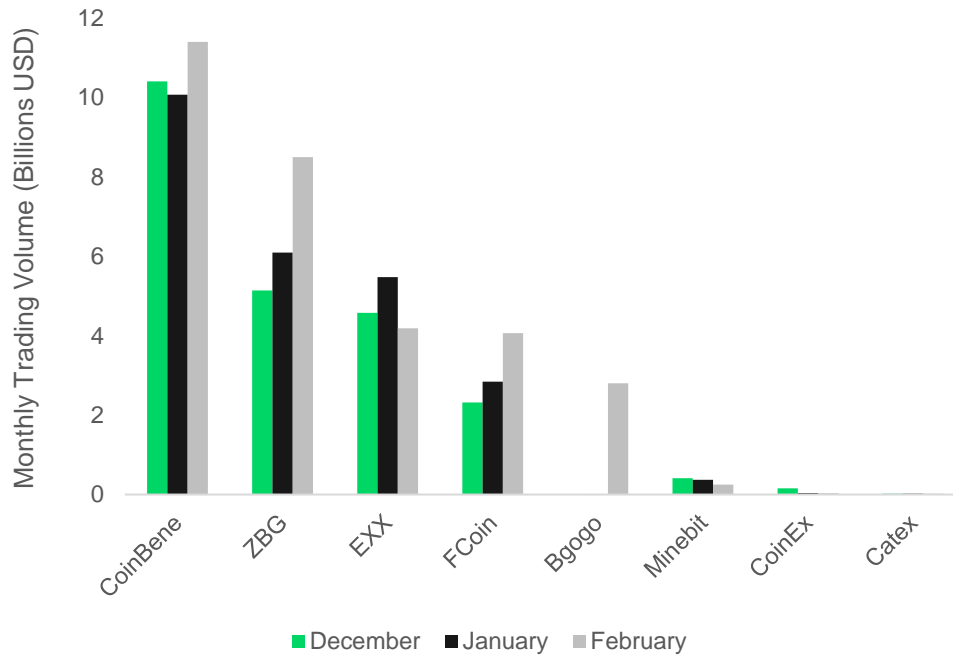
Bithumb’s total trading volume in February was 26.8 billion USD (up 2.8% since January). Meanwhile, Binance traded a total of 18.9 billion USD (up 8%), followed by ZB at 18.1 billion USD (down 7.8%).

## Trading Competitions, Margin Trading and Trans-Fee Mining

It can be seen that among the top exchanges by total volume, most exchanges have implemented some form of trading competition within the last 3 months. Many others offer margin trading, which allows users to trade with leveraged positions and thus higher trade quantities. Other exchanges, such as CoinBene and ZBG implement trans-fee mining structures.

## 2 Transaction Fee Mining Exchange Volume

Figure 16 - Historical Monthly Volume - Top Transaction-Fee Mining Exchanges

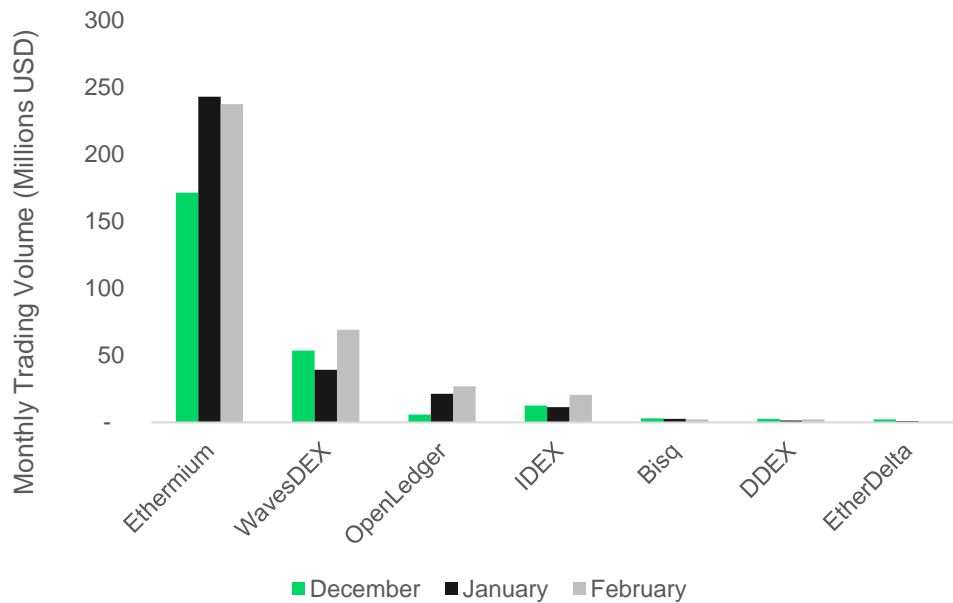


**CoinBene was the largest TFM exchange in February, followed by ZBG and EXX.**

CoinBene traded 11.4 billion USD in total volume in February, up 13% since January. ZBG traded 8.5 billion USD and EXX traded 4.2 billion USD, up 40% and down 23% since January respectively. CoinBene, ZBG, EXX and FCoin represent 90% of volume among the top 8 TFM exchanges.

### 3 Decentralised Exchange Volume

Figure 17 - Historical Monthly Volume - Top Decentralised Exchanges



**Ethermium was the largest DEX in February, followed by WavesDEX and OpenLedger.**

Ethermium traded 237 million USD in monthly volume in February, down 2.2% since January.

WavesDEX volumes increased by 77% in February, to 69 million USD. OpenLedger saw a 24% increase in volume in February, from 21.5 million USD in January to 26.8 million USD.

DEXs continue to represent only a small fraction of global spot exchange volume (0.17%), trading a monthly total of 365 million USD.

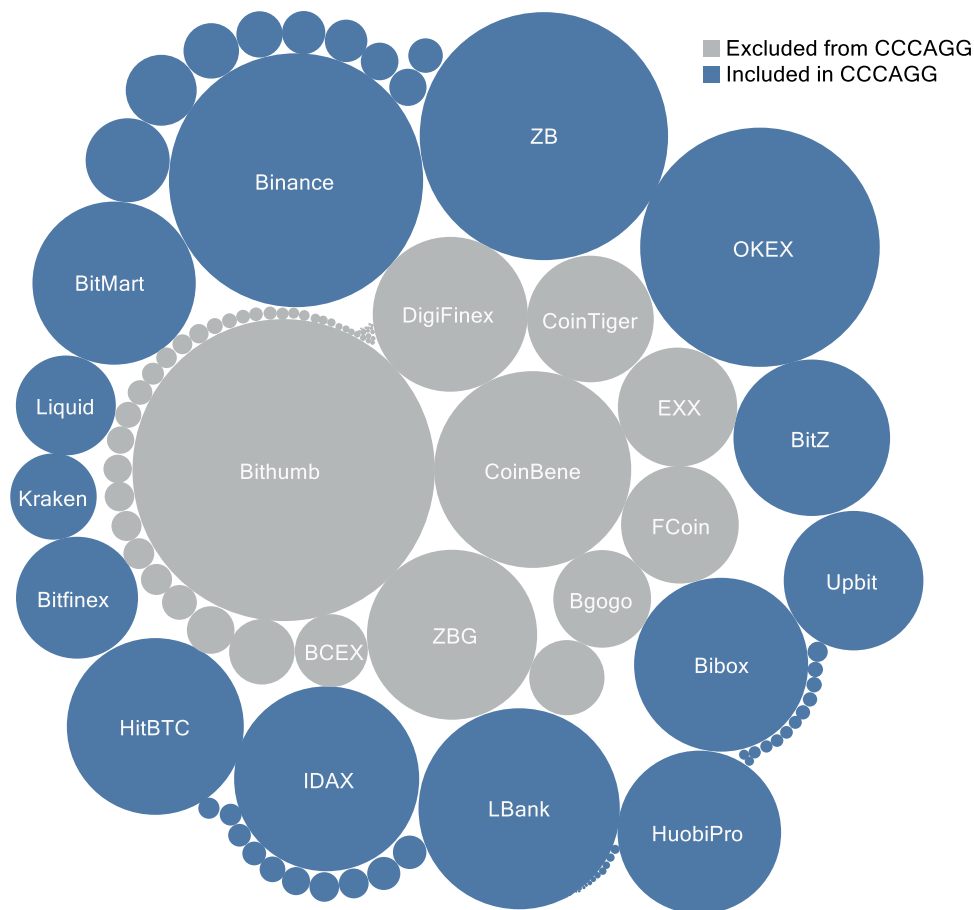
## CCCAGG Exchange Review

CryptoCompare’s Aggregate Pricing Index (the CCCAGG) is used to calculate the best price estimation of cryptocurrency pairs traded across exchanges. It aggregates transactional data from more than 70 exchanges using a 24-hour volume weighted average for every cryptocurrency pair.

However, this data might not always be consistent across exchanges due to events such as hackings, broken APIs, low liquidity levels, transaction fees, market manipulation and so on. It is important that the data used to calculate pricings originate from reliable exchange sources.

CryptoCompare’s Monthly Exchange Review serves as a means of evaluating the integrity of exchange data used to calculate CCCAGG pricing across all pairs. Exchanges that have met the minimum data integrity standard will then be added to the pool of CCCAGG exchanges. Constituent CCCAGG exchanges are reviewed and amended each month to ensure that the most representative and reliable market data is used in CCCAGG pair pricing calculations.

Figure 18 - February CCCAGG Constituent Exchanges



## 1 Assessment of New CryptoCompare Exchanges

This section will evaluate exchanges added to CryptoCompare in January and have since generated data throughout January and February such that they can be assessed for inclusion into the CCCAGG in March.

New exchanges to be assessed: **Bgogo, Binance Jersey**

### Binance Jersey

- Low liquidity, no more than 2000 USD per day on average for the top pairs.
- Pricing deviations within 3% of CCCAGG price for the relevant markets.
- No unusual price spikes or erratic trading behaviour.
- Given its low liquidity at present, it will not be added to the CCCAGG.

### Bgogo

- High liquidity, producing ~100 million USD in daily volume in February.
- Price spikes and erratic volumes can be seen for some of the top pairs.
- Prices are mostly on line with those of equivalent CCCAGG pairs.
- Provides pairs that do not trade on other exchanges, such as those for BGG (Bgogo token).
- Implements trans-fee mining.
- Excluded from CCCAGG for this review, however pairs that do not trade on any other exchanges will be included.

### Bitpoint

- The top trading pairs (BTC, XRP, ETH and LTC to JPY) produce ~1M, 595K, 269K and 62K USD in daily volume per day.
- These pairs do not deviate significantly from corresponding CCCAGG pairs, and do not show any unusual trading patterns or price spikes.
- Our analysis shows that they meet our CCCAGG requirements over the monitoring period and will be integrated with CCCAGG.

## 2 Existing Exchanges to be Excluded from CCCAGG

**QuadrigaCX:** No trading due to bankruptcy.

**Cryptopia:** No trading due to hacking, exchange remains closed.

**Hikenex:** Erratic trading behaviour, higher volatility than other markets, and gaps in trading due to lower API quality.

### 3 Summary of Changes to CCCAGG

|                                  |   |  |
|----------------------------------|---|--|
| <b>What Happened in January?</b> | New exchanges added to CryptoCompare (1):                           | Xena                                     |
|                                  | Exchanges shut down (ceased trading completely): (2)                | Cryptopia, QuadirgaCX                    |
|                                  | Exchanges Removed from CCCAGG (0):                                  | None                                     |
|                                  | January Exchanges Assessed Following Minimum Monitoring Period (3): | Bgogo, Binance Jersey, alphaex, Bitpoint |
| <b>Result of Current Review:</b> | New exchanges to be Included in CCCAGG (0):                         | Bitpoint                                 |
|                                  | Existing exchanges to be included in CCCAGG (0):                    | None                                     |
|                                  | Exchanges to be Removed from CCCAGG (0):                            | Cryptopia, QuadirgaCX, Hikenex           |
| <b>Implementation Date</b>       | 25 <sup>th</sup> March 2019   |  |

## Appendix A - Methodologies

### A1 General CCCAGG Inclusion/Exclusion Methodology

This review is conducted on a monthly basis in order to maintain a minimum exchange standard among constituent CCCAGG exchanges. Given the growing number of cryptocurrency exchanges, as well as those that close due to regulation, bankruptcy and so on, it is necessary to evaluate whether prices and volumes are representative of the market so that investors and fund managers using the CCCAGG indices can be assured that they receive the most accurate information for their purposes.

We are not in the business of policing cryptocurrency exchanges, but aim to set a guideline based on how the majority of cryptocurrency exchanges operate. These majority figures are used as a standard with which to assess whether an exchange is operating in line with most of its industry. Having said this, the industry is constantly evolving and often times one cryptocurrency exchange might not reflect the patterns demonstrated by the majority, for reasons that might relate to innovation, an alternative business model etc. In these cases, CryptoCompare attempts to use its best judgement with preference towards a hands-off approach so that industry developments are accurately reflected. Over time, our guiding standards with which to assess cryptocurrency exchanges will also develop in line with the industry to produce the most representative group of CCCAGG exchanges.

#### Data Processing Procedure

CryptoCompare currently assesses exchanges on the basis of 24-hour volume and pricing data. Every exchange within the CCC database is assessed in this review, with additional exchanges being added or excluded on a monthly basis for a variety of reasons. The 24-hour volume and price of every live trading pair from every exchange is recorded. Each pair volume is compared to the total market volume for that specific pairing and assigned a market share ranking. Pricing for each pair is compared to that of the CCCAGG pair, and a percentage price difference is calculated. Finally, a volume weighted % price difference per pairing is calculated to produce a figure for how close the overall exchange pricing differences are to that of the CCCAGG.

#### % Price Difference vs CCCAGG

As a general guideline, CryptoCompare assumes that exchanges with an overall percentage pricing difference of under 10% is within acceptable boundaries. The reasons for pricing differences across exchanges may be related to a number of factors that include exchange fees, jurisdiction, tax considerations among a series of other factors. It is however, the first indicator of acceptability within the CCCAGG exchange list.

### **Assessment Period**

For new exchanges added to the platform, CryptoCompare assigns a period of time in which to gather data on the exchange before adding it directly to the CCCAGG calculations. Up to the next monthly exchange review, as long as there is adequate positive volume and pricing data, the exchange will be assessed in the same way as all the existing exchanges and added to the CCCAGG if guidelines are met.

### **Dead Exchanges**

Frequently, exchanges will stop trading for a variety of reasons that include bankruptcy, hackings, regulatory reasons and so on. Contingent upon sufficient market data being provided (usually one month), if an exchange has minimal to no trading volume, it will be excluded from the CCCAGG and will be assigned an inactive status.

### **Market Share for Specific Pairs**

There are many cases in which significant pricing differences occur relative to the CCCAGG for a number of pairs that only trade on very few exchanges. The reason for this often points to a lack of liquidity for specific pairs or perhaps a decentralized exchange. If this is the case, then there is usually an exception to the 10% pricing guideline vs CCCAGG pricing. Providing that a specific pair on an exchange represents at least 20% of the market volume or ranks at least third for market share, and prices are within a reasonable boundary, this pair would be deemed acceptable. In addition, for certain pairs that are unique to a small number of exchanges, pricing will vary considerably the lower the liquidity of the pair in question. In this case, more flexibility is given to pricing differences on low liquidity pairs.

### **Current CryptoCompare Policy Towards Zero-Fee and TFM Exchanges**

Zero-fee exchanges as well as transaction-fee mining exchanges present a problem when it comes to assessing whether trading volume as well as pricing are legitimate due to the well-known criticisms of exchanges engaged in these practices. When it comes to zero-fee exchanges, traders are able to trade freely without fees regardless of how many trades are made; hence, volumes might become inflated. In a similar fashion, transaction fee mining exchanges rebate 100% of transaction fees in the form of their own exchange tokens. This might give traders an incentive to trade more to receive more tokens which often have valuable features such as voting rights on the platform or a dividend. Both of the above can effectively lead to wash trading. For this reason, transaction-fee mining trading data is excluded from CCCAGG pricing calculations in the current policy. This policy will be reviewed and improved for when more in-depth analysis has been conducted.

### **Futures Trading**

Despite the significant volumes witnessed for bitcoin futures trading on platforms such as BitflyerFX and BitMEX, these volumes represent futures trading volume, and not spot trading volumes. For this reason, they are excluded from CCCAGG calculations.



## A2 Web Traffic Analysis Methodology

All web traffic statistics were collected using Alexa's web traffic API endpoint. This served as the best way to obtain the most broad and accurate set of statistics across all the exchanges that CryptoCompare evaluates.

### Alexa Methodology

For the purpose of our web traffic analysis, Alexa's historical Traffic Ranks, as well as Pageviews have been used over a one-month period. Alexa computes traffic ranks by analysing the Web usage of millions of Alexa Toolbar users. The information is then manipulated, computed and normalised to correct biases that may occur in their data.

#### **Definitions:**

**Alexa Traffic Rank:** determined on the basis on the combined measure of Unique Visitors (reach) and Pageviews (page views).

**Unique Visitors:** An estimate of the number of unique Alexa users who visit a site on a given day. Alexa expresses this as a ratio of users per million - that is, if a random sample of one million global internet users were taken, then x % of those users would visit a given site.

**Pageviews:** Pageviews are the total number of Alexa Toolbar user URL requests for a site on a given day. Multiple requests for the same URL on the same data by the same user are counted as a single Pageview. This is expressed as a ratio of pageviews per million users.

**Page Views per User:** Represents the average number of unique pages viewed per user per day for a given site.

## Important Data Considerations

It should be noted that Alexa's Traffic Ranks are for domains only (www.domain.com), and therefore subdomains (www.subdomain.domain.com) or subpages (www.domain.com/subpage) are counted within the same domain name.

There are limits to the accuracy of Alexa data for sites with relatively low traffic. According to Alexa, for sites with rankings below 100,000, data may not be statistically meaningful due to the lack of data from these sources.

In addition, traffic data is only based on a set of Alexa users, and therefore only a subset of the global internet population.

## Exchange Web Traffic Analysis Methodology

For the purpose of our web traffic analysis, Alexa's daily historical Traffic Ranks, Pageview stats and Unique Users have been used over a one-month period.

### Methodology

Data was collected via Alexa's Web Traffic API endpoint for a period of one month. Daily Domain Traffic stats for every active exchange on CryptoCompare was collected for a one-month period.

As discussed, Alexa provides proportional measures of Unique Visitors and Page Views in the form of "reach" per million users and "page views" per million users respectively. This was collected via their web API.

In order to obtain an estimate of visitors, an estimate of total web users was obtained from "internetworldstats.com". According to internetworldstats.com, as of June 30<sup>th</sup> 2018, there were a total of 4,208,571,287<sup>4</sup> global internet users.

This was then multiplied by the associated Alexa metric per million figures to obtain an estimate of Unique users and Total Page views. A figure for unique page visitors was

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<sup>4</sup> <https://www.internetworldstats.com/stats.htm>

calculated by dividing Total Page Views by average Page Views per user. Formulas are as follows:

$$\text{Total Page Views} = \text{Page Views per million} * \text{Total Web Users}$$

$$\text{Total Unique Visitors} = \text{Page Views per million} * \text{Total Web Users} / \text{Average Page Views per User}$$

Given the oscillatory nature of web traffic stats, a one-month average of each stat was produced to obtain a more representative traffic value for each exchange. This is then combined with the average 24h volume for each exchange over the given period to initiate our analysis.

## Appendix B - Table of Figures and Tables

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