Kaiko Exchange Ranking

Rulebook

CONTENT

INTRODUCTION

The following document covers the methodology of the Kaiko Exchange Ranking. Markets in crypto assets are by nature highly fragmented, with hundreds or even thousands of exchanges spread over different geographical areas with their own regulatory framework. Each crypto asset trading platform works as an independent dark pool, and as such, official statistics and research data are rarely publicly available.

As a global digital asset market data provider, Kaiko covers more than a hundred cryptocurrency exchanges. However, not all exchanges are offering the same level of standards in terms of legal & compliance, infrastructure security, liquidity, data quality, or even technology. The model aims at ranking all exchanges covered by Kaiko to make sure only the highest quality data are incorporated in the computation of its rates. Said screenings compose a key element to ensure the reliability and authenticity of each and every rate.

DATA SOURCES

The daily price levels are based on the historical tick-by-tick trade data and order book snapshots provided by Kaiko.

Kaiko has been operating since 2014 and is the leading cryptocurrency market data provider for institutional investors and enterprises. It empowers market participants with accurate, transparent, and reliable financial data to be leveraged for a range of market activities. Its mission is to be the foundation of the new digital finance economy by serving as a single source for market information. Said mission is premised on the idea that high-quality data drive market efficiency and greater transparency throughout the industry.

Kaiko sources data globally from more than one hundred cryptocurrency exchanges and 10,000 pairs. It operates an institutional-grade technical stack with storage and collection run on redundant, geographically dispersed servers. Kaiko's unbiased data is currently used for trading, research, valuation and/or display purposes with major market participants. Kaiko collects data from public APIs and sources and where necessary enters into bilateral agreements with exchanges for collection of their data

METHODOLOGY

In order to be able to rank each covered exchange, Kaiko's Exchange Ranking is structured around six criteria with a proprietary scoring methodology internally developed and maintained by Kaiko's Indices team. Each criterion is itself broken down into sub-criteria and assigned a weight to compute the Kaiko Exchange Score™ that serves as the basis for the ranking. The following sections of this document detail the weighting scheme and each criterion framework.

Criteria	Weight
Governance Score	30%
Business Score	15%
Technology Score	10%
Data Quality Score	10%
Security Score	20%
Liquidity Score	15%

Each criterion, scored from 0 to 100 (best), is multiplied with their corresponding weight to derive the Kaiko Exchange Score™. Additionally, the Kaiko Exchange Rank™ aims at rewarding exchanges with consistently high scores and is derived as follows:

Kaiko Exchange Rank™	Kaiko Exchange Score™ at or above	Lowest criteria score at or above
AAA	90	60
AA	75	50
A	60	40
B	45	30
C	30	20
D	15	10
E	0	0

GOVERNANCE SCORE

The first criterion of the ranking focuses on governance, legal & compliance topics. This score aims at measuring six specific sub-criteria to assess the exchange policy in terms of KYC/AML, market surveillance, country risk, financial regulation, and insurance coverage. Assessment of the following sub-criteria is mostly based on the policies issued by the exchanges and the terms and conditions that govern access to the exchanges.

Sub-criteria:

1. **Legal Exchange Name Score**

The legal exchange name score relies on the identification of a legal entity associated with the exchange platform. A positive score is granted to exchanges with a clearly identified legal entity.

2. **Country Risk Score**

The country risk score is complementary to the legal exchange name score since it relates to the associated country of incorporation of the different legal entities. The score is calculated by leveraging the public country risk provided by Coface, translating the grading into a score. In the case of different incorporations, an average grading is calculated to translate it into a unique score.

3. **KYC/AML Score**

The KYC/AML score is based on the robustness of those two policies for individuals registering on the exchange platform. Both of them are mandatory procedures, required by law, to mitigate the risks of banks and companies being used as vehicles for financial crime. The score is constructed by making a qualitative assessment of the availability and the robustness of such procedures. Strict policies are awarded a greater score by preventing financial crime.

4. **Trading Policy & Market Surveillance Score**

The trading policy and market surveillance score relates to publicly stated rules that govern trading activity to prevent market abuse and internal resources or third parties monitoring the activity on the exchange. The score is constructed by making a qualitative assessment of the existence and enforcement of such policies on the platform. A greater score is granted when there is clear evidence that both policies are implemented.

5. Insurance Score

The insurance score is dedicated to the evaluation of the financial capacity of exchanges to recover from potential losses due to a failure in their internal system or an external attack that would cause financial losses to their users. This score is built by making a qualitative assessment, based on publicly available information, of whether a loss insurance fund exists through a third-party provider or a dedicated internal fund. A positive score is awarded to exchanges providing such protection.

6. Financial Regulation Score

The financial regulation score is a reference score to assess the trustworthiness of the previous sub-criteria mostly collected through publicly shared documents from the exchanges. Indeed, it relates to the local regulatory status awarded by relevant and recognized financial regulators. A properly regulated exchange is assumed to have gone through a rigorous verification and audit process to validate governance, legal, and compliance issues. A significant positive score is awarded to exchanges classified as money services businesses (MSB) or regulated financial institutions.

BUSINESS SCORE

The exchanges are then scored according to a list of three business-related sub-criteria, built on public data such as the founding year, the executive team, or the number of quoted pairs. The aim of this category is to assess the maturity but also the quality of the business activity of the exchange by leveraging the strength of the team and the product offer.

Sub-criteria:

1. **Company Score**

The company score relies on two specific metrics: the identification of the company (website, LinkedIn page, etc.) and the age of the exchange.

- Identified companies are awarded a greater score as compared to non-identified companies.

- Exchanges are then ranked and classified according to their age; each class is allocated a number of points with the rule that the longer the exchange has been operating, the higher the score.

2. **Team Score**

The team score relies on a scoring method that awards points based on the number of key executive people (CEO, CTO, COO, and CCO) identified in the company. For this sub-criterion, we assume Linkedin as a trusted source of information. The score is constructed on the number of executives identified but also on the basis of critical key execs identified: Chief Executive Officer and Chief Compliance Officer. Thus the score represents the sum between the number of executives and their identity. A bonus is awarded for the combination of the four executives and a malus is given if no CEO is identified.

3. **Product Score**

The product score relies on one dedicated metric which is the asset diversity, currently based on the number of quoted pairs per exchange. Exchanges are ranked and classified according to this number. Each class is allocated a number of points with the rule that the more listed pairs on the exchange, the higher the score.

TECHNOLOGY SCORE

The exchanges are screened according to different technology-related sub-criteria built on data collected from their public market data distribution pipeline. By assessing the quality of specific metrics, the model aims to measure the capacity of an exchange's platform to provide market-level information through widely adopted distribution standards, while ensuring a significant level of infrastructure reliability.

Sub-criteria:

1. **Feeds Score**

The feeds score relies on the different distribution channels provided by the exchange. Market standards suggest that REST API distribution is systematically used for market data, especially for historical data. REST APIs follow the request-response communication model. Some platforms also provide another type of distribution pipeline, namely Websocket API. It follows the exclusive pair communication model (bi-directional). Once the connection is set up the messages can be sent and received continuously without any interruption. The sophistication of Websocket API enables real-time market data thus a greater number of points is awarded to exchanges providing Websocket & REST communications.

2. **Rate Limiting Score**

To prevent an API from being overwhelmed, API owners often enforce a limit on the number of requests, or the quantity of data clients can consume within a given time period. This rate-limiting can be applied to both REST and Websocket. Thus, the score is built by differentiating between the two distribution channels and assessing if the channels are subject to rate limiting, then applying a classification that deducts a number of points depending on the strictness of the rate limiting. The absence of information also has a negative impact on the score. This score is usually negative considering the degree of rate-limiting on the platforms. Data can be retrieved in the API documentation of the exchanges.

3. **Downtime Score**

API downtime is characterized by situations where APIs fail to do their job. It is one of the biggest threats to qualitative market data distribution. This score is built on 3 complementary sub-metrics: the existence of a status page monitoring API downtime, the average number of downtime per month, and finally the evolution of the downtime history over the past 3 months. The downtime score is the combination of those and can be positive or negative depending on the availability of the information and the quality of the public market data distribution.

DATA QUALITY SCORE

The scoring is also subject to an assessment of the data quality provided by the exchanges as public market data. Indeed, data quality is defined by a list of three main sub-criteria related to the type of market data available: trade data, OHLCV data, order book data. This category aims at measuring the diversity of public market data and the capacity of the exchange to provide real-time feeds or historical data.

Sub-criteria:

1. **Trade Data Score**

The trade data score relies on two specific metrics: real-time trade data and historical trade data.

- Exchanges that provide real-time trade data are awarded a small positive score or a high negative score as this type of data is considered in this ranking as a basic standard for market data.

- Exchanges that provide historical trade data are granted a positive score depending on the size of the history capacity. In the case of no available information or no historical data, a negative score is applied.

2. **OHLCV Score**

The OHLCV (or k-line data) is an aggregated form of market data standing for Open, High, Low, Close, and Volume. The OHLCV score is derived from the availability of such market data through the exchange data distribution feeds and the maximum granularity provided for this aggregate. A higher score is awarded to exchanges that provide OHLCV and allow a low granularity (ie. contains a high level of details). A negative score is applied if OHLCV is not distributed or if no information can be found.

3. **Order Book Score**

An order book is a list containing all outstanding buy or sell orders for an asset, organized by price level. It is the most granular liquidity data in the industry optimized for quantitative analysis. Thus, the order book score is calculated by assessing the availability of real-time feed and historical data. A higher score is awarded to exchanges that provide real-time and historical order book data.

SECURITY SCORE

Exchange security is paramount when dealing with digital assets. Kaiko model aims at assessing the security of each exchange it covers by monitoring the following aspects:

Sub-criteria:

1. **Security Certificates Score**

The ongoing and increasing threats to cybersecurity are a major concern for companies of all sizes and in all industries. Security certificates such as SOC or ISO27001 layout guidelines for building and documenting an organization's risk management program based on objectives and controls. Entities with industry-leading standards get the highest score while the absence of certificates (or information about them) gets the lowest score.

2. **Cold Storage Score**

Exchanges should ideally have nearly 100% of customer funds encrypted, geographically separated, and offline stored.

3. **Clients Account Protection Score**

Exchanges are screened according to their user account protection. Elements such as two-factor authentication are particularly sought for in order to mitigate the risk of illicit login.

4. **Recent Hacks Penalty**

Exchange hacks are unfortunately still current despite the numerous efforts deployed by exchanges to secure their platform. Kaiko lists all hacks suffered by the covered exchanges and imposes a penalty to the score calculated above. The penalty depends on how recent the hack happened and how much was originally stolen from the exchange.

5. **Bug Bounty Program Score**

Those offer rewards for external agents assisting exchanges when detecting bugs and potential security breaches. Rewards typically depend on how severe the vulnerability is, from accessing low (very limited amounts of data) to critical (direct and immediate risk to a broad array of users). The score is calculated on the maximum reward offered.

LIQUIDITY SCORE

The ranking relies on liquidity metrics to evaluate the level and stability of trading activity but also on the quality of liquidity reported on the platform. The aim is to assess the level of trading on exchanges in absolute and relative terms. As such, two main types of data are leveraged: volume and web traffic.

Sub-criteria:

1. **Trading Activity Score**

Trading activity is measured by the 3-months volume history in absolute and relative terms. Thus, for both the raw volume (absolute) and the volume contribution (relative), the score takes into account the classification of the exchanges according to those two metrics and the 3-months growth tendency. Indeed, the score is influenced by the level of classification but also by the evolution of the liquidity on the platform over the last 3 months. Finally, an average of the raw volume score and the contribution score is calculated to derive a global trading activity score.

2. **Dispersion Score**

The coefficient of variation (CV) is the ratio of the standard deviation to the mean. The higher the coefficient of variation, the greater the level of dispersion around the mean. Without units, it allows for comparison between distributions of values whose scales of measurement are not comparable. The lower the value of the coefficient of variation, the more precise the estimate. Thus, the dispersion score for each exchange is calculated by using a classification method leveraging the average of all assets' daily coefficient of variation.

3. **Market Quality Score**

The market quality score is dedicated to evaluating the ratio of reported volume to the normalized or real trading volume. In order to create a proxy for measuring real trading activity, a quantitative parameter that leverages web traffic and reported volume over the last 3 months is constructed to estimate a normalized trading volume. The score relies on different market standards (benchmark selection of exchanges) and thresholds (matching score with market standards) combined with a 3-months benchmark matching tendency metric to estimate the market quality. This parameter also allows to flag exchanges that might be subject to manipulative trading policies such as frontrunning, wash trading, etc. In this case, a negative score is applied to flagged exchanges.

REVIEW CALENDAR

SCHEDULED REVIEW

The scores are updated on a semi-annual basis in June and December, and use the following review calendar:

Event	Date	Description	Example with June 2022 rebalancing
Cut-off	The last day of the month preceding the rebalancing	Data collection for composition determination stops on that day*	31st of May, 2022
Underlying data	Second Friday of the rebalancing month	The new scores are published	10th of June, 2022
Effective	First Monday after the third Friday of the rebalancing month	The new scores are effective	20th of June, 2022

For instance, if a 3-month ADTV has to be calculated, the covered period will start 3 months before the cut-off date and end on the cut-off date (included)

EXTRAORDINARY REVIEW

Kaiko Index reserves the right to update one or more than one score outside of a scheduled review. Such an extraordinary event would happen if an exchange has been found to commit an action such as:

- Fraud
- Market manipulation
- Significant loss of volume or liquidity
- Material adverse event affecting the exchange

In such cases, the Kaiko Index Steering Committee will publish its findings and update the exchange scores accordingly within 3 days after the initial public communication.

DISCLAIMER

This content is the property of Kaiko, and its affiliates.

This content has been prepared solely for informational purposes, does not constitute an offer for sale, and is based upon information generally available to the public and from sources believed to be reliable. No content contained may be modified, reverse-engineered, reproduced or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of Kaiko; except that a personal, non-commercial use shall be permitted. The content shall not be used for any unlawful or unauthorized purposes. Kaiko and its third-party data providers and licensors do not guarantee the accuracy, completeness, timeliness or availability of any content. Kaiko is not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of any content and such content is provided "AS IS. KAIKO DISCLAIMS ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT'S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR HARDWARE CONFIGURATION. In no event shall Kaiko be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs) in connection with any use of the content even if advised of the possibility of such damages.