Kaiko Indices

Kaiko Continuous Reference Rates

Capital Market Rates

Equity, FX, Commodity

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About Kaiko Indices

Kaiko Indices offers institutional-grade rates and indices, setting the standard for reliability and transparency in the digital asset and capital markets. Our benchmarks are administered under a governance framework that is compliant with IOSCO principles. We empower exchanges, asset managers, and financial institutions with trusted data solutions that support robust settlement and risk management practices.

Version History

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1. Introduction

This document sets out the methodology of the Kaiko Continuous Capital Market Reference Rates (the "Kaiko Continuous Rates"), a family of reference rates covering equities, equity index futures, foreign exchange (FX), and commodities. Each rate is designed to deliver a single, continuously published reference price that remains available across global trading sessions, including periods when the primary cash or listed market is closed. The rates are constructed to be transparent and manipulation-resistant, and are designed for use in liquidation mechanisms, funding-rate calculations, margin determinations, and the settlement of derivative products that require continuous pricing.

When the primary market is closed, including at weekends and on exchange holidays for all rate families, the Kaiko Continuous Rates are derived from prices of crypto-asset perpetual futures quoted in stablecoins on centralized or decentralized venues that are not regulated exchanges. Users should read the risk disclosures in Section 9 of the Benchmark Transparency Statement, particularly those relating to reflexivity, reopening gaps and stablecoin quote-asset risk.

Section 2 sets out the shared methodology including data sources, microprice computation, liquidity weighting, and the aggregation framework that applies to all Kaiko Capital Market Reference Rates. Section 3 then specifies, for each rate family (Equity, FX, Commodity), the data sources, trading-hour coverage, and calculation parameters used.

This Methodology is reviewed and approved by the Oversight Committee on at least an annual basis, and additionally whenever a material change to the Methodology is proposed, ensuring that Kaiko Rates continue to evolve with market developments while maintaining methodological consistency and reliability. This document should be read in conjunction with the Kaiko Capital Market Reference Rates Benchmark Transparency Statement, available on the Kaiko website.

The Kaiko Continuous Rates are outside the scope of Regulation (EU) 2016/1011 (BMR) as amended by Regulation (EU) 2025/914. The grounds are set out in Section 5 of the Benchmark Transparency Statement.

2. Methodology

Section 2 sets out the common methodology applicable to all Kaiko Continuous Capital Market Reference Rates, Equity, FX, and Commodity. The shared framework comprises the data-source vetting principles (§2.1-2.2), the microprice and liquidity-weight definitions (§2.3.1.1–§2.3.1.2), the time-weighted volume-weighted-median aggregation (§2.3.1.3), and the cascading priority feed, including source transition and off-market behavior (§2.3.2) the treatment of corporate actions (§2.4), expert judgment (§2.5) and publication (§2.6). Rate-specific calculation steps, parameters, data sources, and trading hours are specified in Section 3.

2.1. Data Sources

2.1.1. Asset Coverage

The capital market rates provide coverage across key segments demonstrating sufficient liquidity and data quality. Coverage extends to:

- All National Market System (NMS)-listed U.S. equities and major U.S. index ETFs
- Major equities and index ETFs listed on the Hong Kong Stock Exchange (HKEX), Singapore Exchange (SGX), and Japan Exchange Group (JPX)
- Equity index futures listed on HKEX and SGX
- Major foreign exchange and selected emerging-market currency pairs sourced from the wholesale interdealer market
- Commodities: precious metals (gold, silver) and energy (Brent crude, WTI crude, European natural gas (TTF))

The complete and current list of underlying assets covered by each Kaiko Continuous Capital Market Reference Rate is maintained by the Administrator and published at the Kaiko website[1]. The list constitutes the authoritative coverage record and is updated upon any change to the constituent universe.

[1] https://www.kaiko.com/reference-rates-capital-markets

2.1.2. Kaiko Capital Market Reference Rate

Kaiko Continuous Reference Rates are calculated using prices derived from the suite of Kaiko Capital Market Reference Rates, computed using real-time orderbook data provided by Kaiko. These rates serve as the underlying components, and their prices are incorporated into the computation of the index value. To ensure accuracy and reliability, a robust price aggregation methodology is applied, as outlined in the Kaiko Capital Market Reference Rates methodology[2].

2.1.2.1. Spot

Kaiko Continuous Reference Rates derive their spot-tier prices from Kaiko's existing suite of Capital Market Reference Rates, which are themselves computed from real-time orderbook data provided by Kaiko, following the Reference Rates methodology.

Equity

The Kaiko Equity Reference Rate sources for U.S. equities, real-time, sub-second National Best Bid and Offer (NBBO) feed data and, for the U.S. overnight session, BBO data from Blue Ocean ATS and Bruce ATS. For equities listed in Asia, it sources real-time venue-level Best Bid and Offer (BBO) data from the relevant exchange across all covered exchanges. Each feed delivers continuous quote updates reflecting the most competitive bid and offer prices available on the respective venue.

Foreign Exchange

The Kaiko FX Reference Rate sources real-time indicative streaming prices order-book data from TP ICAP, a leading global interdealer broker that aggregates streaming prices from institutional counterparties across its electronic platforms, distributed as a commercial market data feed. The feed delivers continuous Best Bid and Offer (BBO) updates quotes for major and selected emerging-market currency pairs from the wholesale over-the-counter (OTC) interdealer FX market. These quotes are indicative and do not represent firm,

2 https://resources.kaiko.com/hubfs/Factsheets%2c%20Rulebooks%2c%20Methodologies%20(Resources)/Kaiko%20Indices/Rulebooks%20and%20methodologies/Kaiko%20Indices%20rulebooks/Capital%20Market%20Rates%20Rulebook.pdf

transactable prices. The feed covers, providing 24/5 trading coverage across the Sydney, Tokyo, London, New York trading sessions.

Commodities

The Kaiko Commodity Reference Rates source data from a combination of wholesale OTC market data from TP ICAP, selected to provide coverage across precious metals, base metals, energy, and agricultural soft commodities. Underlying price feed is real-time spot order-book data for precious metals (gold, silver) and one-month flat-price commodity swaps for Brent, WTI, and European natural gas (TTF), from the wholesale OTC interdealer market, providing 24/5 coverage in line with global market hours. The one-month swap referenced at any time is the front-month contract, which rolls to the following month based on ICE expiry calendar

2.1.2.2. Calendar Futures

The calendar-futures price is sourced directly from Kaiko's existing suite of Capital Market Reference Rates, computed from real-time orderbook data of the relevant listed calendar-futures contract following the Reference Rates methodology.

For a limited number of assets that trade only through listed calendar futures, with no cash market, the calendar-futures price is the primary source of the rate. For assets that also trade in a cash market, the calendar-futures data allows extended coverage beyond cash-market hours and serves as the second-priority source in the cascade defined in §2.3.2, used when the spot price is unavailable.

The reference contract details and its rollover schedule are specified in the Kaiko Capital Market Reference Rates Rulebook.

2.1.2.3. Perpetual futures

The perpetual futures-based rate is constructed on real-time orderbook data from vetted perpetual-futures exchanges, for contracts quoted in USDT or USDC. The exchange selection process can be found in §2.2.

2.1.3. Trading Hours and Holiday Calendars

Trading hours and holiday calendars applicable to each rate follow the published schedule of the relevant trading venue. The underlying market calendar and trading hour data is sourced from the third-party provider **TradingHours.com** and is maintained by Kaiko. The Index Team reconciles this data against the calendars published by the relevant venues at least monthly, and the venue's published calendar prevails in case of discrepancy.

2.2.Exchange Selection Model for Perpetual Futures

Perpetual futures markets are inherently fragmented. Contracts referencing the same underlying asset are listed on off-chain exchanges, operated as centralized exchanges with an internal matching engine, and on on-chain exchanges, where orders are matched and settled through smart contracts on a public blockchain. Exchanges differ materially in contract design, margining model, index or oracle reference, funding mechanism, and regulatory standing.

The Exchange Selection Model ensures that only high-quality, liquid data sources are incorporated into the computation of the perpetual-futures-based price of each rate. It proceeds in two stages: Exchange Due Diligence (§2.2.1), an exchange-level, asset-agnostic screen, followed by Liquidity Optimization (§2.2.2), an asset-specific selection of the constituent exchanges and quote asset for each underlying. This two-stage structure mirrors the Asset-agnostic Vetting to Asset-specific Vetting progression used for centralized spot exchanges in the Kaiko Digital Assets Rates Rulebook, §5.2 — see that section for the equivalent process on the spot/centralized-exchange side.

2.2.1. Exchange Due Diligence

Each exchange is assessed at exchange level, independently of the contracts it lists, against the following criteria. Exchanges meeting all criteria constitute the eligible exchange pool for the relevant underlying. For off-chain exchanges, Kaiko Exchange Ranking is utilized as a source of due diligence.

- Integration into Kaiko's market data infrastructure, with continuous real-time and historical trade data available.
- Absence of the operator, its known beneficial owners and controlling persons, and, for on-chain exchanges, the protocol's known developer or governing entity, from the sanctions lists of the European Union, the United Nations, the United States (OFAC) and the United Kingdom (OFSI), and absence of incorporation or principal operations in a comprehensively sanctioned jurisdiction. Screening is performed at onboarding and at each Quarterly Review.
- Operational reliability, including data-feed continuity and the absence of material outages or unexplained trading halts.

- For off-chain exchanges, the regulatory standing of the operator, meaning that the operator (i) holds an authorization or registration to provide derivatives or crypto-asset services in at least one jurisdiction, and (ii) is not subject to a published enforcement action by a competent authority alleging market manipulation or fraud, or prohibiting its services; for on-chain exchanges, the transparency and verifiability of the smart contracts through which orders are matched and settled.

2.2.2. Liquidity Optimization

For each underlying asset, the perpetual-futures contracts listed on exchanges that pass Exchange Due Diligence are assessed in two sequential steps: quote-asset selection, then exchange selection.

Input data consists of the per-exchange microprice and liquidity weight defined in §2.3.1.1 and §2.3.1.2. Liquidity weights are normalized by the contract size of each instrument and expressed in USD notional by converting to USD using the Kaiko Reference Rates, so that all exchanges are assessed on a like-for-like basis against the USD spot rate.

The assessment window is the 7 calendar days ending on the Cut-off Date defined in §2.2.3.1 (the "Assessment Window").

2.2.2.1. Quote-asset selection.

Contracts quoted in different stablecoins are not combined. For each underlying asset, a single quote asset (USDT or USDC) is selected. The quote asset whose eligible exchanges provide the highest aggregate USD-notional liquidity over the Assessment Window is retained. Contracts quoted in any other asset are excluded from the computation of the relevant rate.

2.2.2.2. Spot-anchored exchange selection.

Within the selected quote asset, the constituent exchanges for each underlying asset are determined over the assessment window through the following spot-anchored procedure.

- **Deviation measure**. Each exchange's microprice and the spot price series are sampled on a common one-second grid, retaining the last observation in each second, over the seconds of the Assessment Window in which both series are available. The per-second

deviation is the absolute difference between the exchange microprice and the spot price, expressed in basis points. An exchange's deviation is the median of its per-second deviations **over the Assessment Window**.

- **Initial exchange selection**. The exchange with the smallest median deviation from the Kaiko spot Reference Rate of the underlying asset is included first.
- **Iterative inclusion**. The remaining exchanges are evaluated in ascending order of deviation. An exchange is included where its median deviation from the consensus price does not exceed **25 basis points**. The consensus price is the liquidity-weighted median of the exchanges already included and is recomputed after each inclusion.
- **Termination**. The procedure terminates at the first exchange whose median deviation from the consensus price exceeds 25 basis points or when the number of exchanges reaches five (5).

2.2.3. Exchange Review and Rebalancing

2.2.3.1. Quarterly Review

Perpetual futures prices are subject to periodic review to ensure continued compliance with the methodology and representativeness of the underlying market.

Kaiko Continuous Rate follows a quarterly review and rebalancing calendar (March, June, September and December) with cut-off and effective dates structuring the data collection and processing periods followed by publication periods (the calendar dates and weekdays do not account for any holidays)

Event	Date	Description	Example with March 2027 rebalancing
Cut-off Date	Last day of the month preceding the Rebalancing Month.	Data collection for exchange composition stops on that day.	2027-02-28
ER Effective Date	First business day of the Review Month	Publication of the new version of the exchange ranking	2027-03-01
Effective Date	Monday after the third Friday of the Rebalancing	The new exchange composition becomes	2027-03-22

	Month. The new composition is applied in a single switch, which occurs between 12:00 UTC and 12:10 UTC on that day.	effective in the calculation of the rates.	

2.2.3.2. Extraordinary Review

On the basis of its qualified and expert judgement, Kaiko Indices may conduct an Extraordinary Review outside the Scheduled Review calendar in the following circumstances:

- Significant loss of volume or liquidity, trading halt or suspension;
- Loss of the operator's regulatory standing (off-chain exchange) or a material smart-contract incident (on-chain exchange);
- Inclusion of the operator, or of a person referred to in 2.2.1, on a sanctions list, suspension of withdrawals, insolvency, or a material security incident;
- Any other event materially affecting a venue's continued eligibility under §2.2.1.

Where the event affects, or may affect, the integrity of a rate, the Index Team may exclude the exchange from the calculation with immediate effect, pending the outcome of the review by the Oversight Committee. Users are notified of the exclusion without undue delay. In such cases, the Oversight Committee will publish its findings within 3 business days after the initial public communication.

2.3.Rates Calculation

This section sets out how the Kaiko Continuous Capital Market Reference Rates (the "Kaiko Continuous Rates") are calculated. The Kaiko Continuous Rates draw prices from three types of sources: the spot market, calendar futures, and perpetual futures. The spot price and the calendar-futures-based price are directly from the Kaiko Capital Market Reference Rate. The perpetual-futures component is computed using Kaiko's standard Reference Rate calculation methodology (§2.3.1). The published rate is then calculated as a cascading price feed across these priority sources, including source transition and behavior in illiquid or off-market conditions (§2.3.2).

2.3.1. Perpetual Futures Price Calculation

The perpetual-futures price is computed from real-time orderbook data using Kaiko's standard Reference Rate calculation methodology.

2.3.1.1. Microprice Computation

A microprice is computed at each BBO update to provide a continuous estimate of the prevailing fair value. Unlike the simple mid-price, which assigns equal weight to the bid and ask quotes, the microprice accounts for the relative quoted size on each side of the order book.

$$microPrice = \frac{Bid\ Price\ x\ Ask\ Size\ +\ Ask\ Price\ x\ Bid\ Size}{Bid\ Size\ +\ Ask\ Size}$$

2.3.1.2. Liquidity Weight

For each microprice observation, a liquidity weight is assigned to represent the reliability and robustness of that observation. This weight captures the average depth available at the top of the order book, emphasizing price updates supported by stronger liquidity.

$$liquidityWeight = \frac{Bid\ Size\ +\ Ask\ Size}{2}$$

2.3.1.3. Price Aggregation

The final price is computed using a time-weighted aggregation of volume-weighted medians where, for Best Bid and Offer (BBO)-based inputs, the microprice serves as the price and the liquidity weight as the volume.

This aggregation framework stabilizes short-term noise through median-based smoothing, mitigates the influence of outliers by emphasizing central market values, remains responsive to genuine market movements via time-weighting, and enhances manipulation resistance by reducing reliance on single-point observations.

Step-by-step Methodology

- **Data Collection**: At calculation time, end of each publication interval for real-time and at set times for daily fixings, collect all trades or calculated microprice and liquidity weight pairs from Best Bid and Offer (BBO) snapshot in the calculation window.

- **Partition Creation:** Divide the calculation window into equal time-based partitions as specified in the parameter table below.

- **Partition-level Calculation**: Calculate the Volume-Weighted Median for each partition using liquidity weight. This method provides inherent resistance to outliers and ensures robust price representation within each time segment.

- **Time-weighting application**: Assign time-based weights to each partition's Volume-Weighted Median, with higher weights applied to more recent partitions to reflect current market conditions.

- **Final Aggregation**: Sum the time-weighted partition VWMs to produce the reference price for the publication event.

Calculation parameters

Parameter	Value
Publication frequency	Every 500 millisecond(s)
Calculation window (S_wind)	15 seconds
Partition size (S_part)	3 seconds
Number of partitions (K)	5

Input

- t : The timestamp at which the rate is calculated
- S_{wind} : The size of the calculation period for which observations are collected and aggregated
- S_{part} : The size of each partition in the calculation window
- K : The number of partitions, an integer calculated as S_{wind}/S_{part}
- k : k-th partition
- I_k : The list of microprice observations included in partition k and ordered by ascending price
- ${p_i}^k$: i-th price (microprice) in the k-th partition (price-ordered distribution)
- ${v_i}^k$: i-th liquidity weight in the k-th partition (price-ordered distribution)
- VWM_k : Volume-weighted median of the k-th partition
- WP_t : Window price (WP) at time t

Volume-Weighted Median

$$VWM_k = p_j{}^k \text{ where } j \text{ satisfies } \sum_{i=0}^{j-1} v_i{}^k < \frac{\sum_{i=1}^{I_k} v_i{}^k}{2} \text{ and } \sum_{i=j+1}^{I_k} v_i{}^k \leq \frac{\sum_{i=1}^{I_k} v_i{}^k}{2}$$

$$if \ \exists\, j\colon v_j{}^k > \frac{\sum_{i=1}^{I_k} v_i{}^k}{2}, \text{ then } VWM_k = p_j{}^k$$

$$if \ \exists\, j\colon \sum_{i=j+1}^{I_k} v_i{}^k = \frac{\sum_{i=1}^{I_k} v_i{}^k}{2}, \text{ then } VWM_k = \frac{p_j{}^k + p_{j+1}{}^k}{2}$$

Final Price

$$Rate_t = \sum_{k=1}^{K} \left(VWM_k \times \overline{w}_k \right) \ where \ \overline{w}_k = \frac{w_k}{\sum_j w_j}, \ w_k = \frac{1}{K} \sum_{j=1}^{k} 1_{j \leq k}$$

2.3.1.4. Quote-asset conversion

If the selected quote asset is different to that of primary source, the rate is converted to the quote asset in which the primary source is denominated (the relevant fiat currency, e.g. USD, EUR for TTF, or the quote currency of the FX pair) of primary source using Kaiko Reference Rate.

2.3.2. Kaiko Continuous Rates Calculation

This section defines how the Kaiko Continuous Rate resolves a single published price from the available source prices. At each publication, the rate selects a source according to a strict priority order (§2.3.2.1) and applies exponential moving average smoothing to transitions between sources (§2.3.2.2). Together these ensure the rate is published continuously across all trading sessions, with a controlled response as it moves between the spot, calendar-futures, and perpetual-futures sources.

2.3.2.1. Price Priority

The rate resolves prices in strict priority order. A lower-priority source is used only when all higher-priority sources are unavailable.

Priority	Source	Condition
Priority 1	Spot	Primary sources
Priority 2	Calendar Futures	When spot market is not available
Priority 3	Perpetual Futures	When Spot and Calendar futures market are not available

U.S. single stocks have no calendar-futures source. When no U.S. equity session is open (from Friday 8:00 PM to Sunday 8:00 PM ET, and on U.S. exchange holidays), the Kaiko Continuous Rates therefore use the perpetual futures price.

2.3.2.2. Exponential Moving Average Smoothing

Exponential Moving Average (EMA) smoothing serves two purposes: smoothing the transition between sources and damping the rate's responsiveness while a fallback source is standing in for an unavailable primary source. It is designed to react slowly to price changes in the perpetual futures market, which has a thinner orderbook and higher price volatility than the primary market. Damping the response limits the influence of this transient noise and strengthens manipulation resistance until a primary source becomes available again.

Principle

When the currently published source becomes unavailable, the source of the rate transitions to the next available source in priority order following the EMA process. It is also applied when the currently available source is perpetual-futures as the perpetual-futures market is typically thinner and noisier during those windows than the primary market it is standing in for. When a higher-priority source becomes available, the rate switches to that source immediately, without EMA smoothing. As a result, the published rate may move abruptly when the primary market reopens.

The final rate is calculated as below. In the formula below, A is the last published value of the rate at the time the transition is activated, B_t is a price from the new source, t denotes each successive rate publication, Δt is the time elapsed since the previous publication, τ is the EMA time constant set by market state as specified in the table below, and α is the resulting smoothing factor, bounded between 0 and 1.

$$Rate_t = A + EMA_t$$

$$where\ EMA_t = \alpha * (B_t - A) + (1 - \alpha) * EMA_{t-1}$$

$$\alpha = 1 - e^{(-\Delta t/\tau)}$$

Transition completes when $\frac{|Rate_t - B_t|}{B_t} < 0.001$. EMA_t is initialized to zero at every activation.

Where the new source is the calendar-futures price, the rate is equal to that price once the transition has completed. Where the new source is the perpetual-futures price, smoothing continues to apply for as long as the perpetual-futures price is used.

EMA Parameters by Market State

Market State	τ	Time of convergence to 95% of difference
Regular hour	150s	≈7.5 minutes
Extended hour (pre/post-market)	150s	≈7.5 minutes
Overnight	3600s	≈3 hours
Closed hour (weekend, holidays)	3600s	≈3 hours

2.3.3. Data Gaps

Missing Data

Kaiko Continuous Rates utilizes up to three different price sources by design as a fallback. If none of the data sources are available while EMA smoothing is in progress, it continues

its progress based on the last available input for a maximum of 30 minutes. If no source is available once the transition has completed or the 30-minute limit is reached, or at any time when no transition is in progress, publication is suspended until a source becomes available. Publication then resumes from the highest-priority available source, applying EMA smoothing from the last published value where that source is the perpetual-futures price.

Delayed Data

If Kaiko is unable to retrieve relevant data at the calculation time, the next available source in priority order is used to calculate the rates following the EMA smoothing.

2.3.4. Limitations

The methodology is designed to limit, but cannot eliminate, the risks arising from the use of perpetual futures prices when the primary market is closed, including reflexivity where a venue references the rate, reopening gaps and stablecoin quote-asset risk. These risks are described in Section 9 of the Benchmark Transparency Statement.

2.4.Corporate Action

Kaiko does not apply a discretionary adjustment factor to the Kaiko Continuous Rate in response to a corporate action. The rate reflects the corporate-action-adjusted price as it is formed in the underlying market: when a constituent venue adjusts its quoted and traded prices for an event such as a stock split, reverse split, or stock dividend, the Continuous Rate reflects that adjusted price through the standard source-selection and aggregation process described in section 2.3. No ratio, divisor, or offset is applied by Kaiko.

Corporate actions take effect in the primary market on the effective date of the event. In the primary market, the affected instrument does not trade before the regular market open on the effective date, as in general there is neither overnight nor pre-market trading in the instrument ahead of a major corporate action. The adjusted price is established at the regular market open, and the Continuous Rate reflects the adjusted price from the regular market open.

Perpetual-futures venues may apply a corporate-action adjustment at different times, so their prices can diverge during this window. Kaiko may exclude any constituent exchange

that applies the adjustment inconsistently until the venues realign. Kaiko announces each scheduled corporate action and its effective time in advance on its website.

2.5.Expert Judgment and Discretion

Expert judgment may be exercised only in the circumstances set out in Section 4 of the Benchmark Transparency Statement. In such circumstances, the Index Team may only: (i) substitute or supplement a data source with an alternative source meeting the eligibility criteria of §2.2.1; (ii) modify the timing, frequency or calculation window of the calculation; (iii) temporarily exclude, cap or apply adjusted treatment to data from affected venues or periods; (iv) use time-weighted or volume-weighted averages, median values or last observed prices; (v) forward-fill the last published value for no longer than 30 minutes; or (vi) suspend publication. Each exercise of discretion is documented, notified to licensed users without undue delay, and submitted to the Oversight Committee for review. Any other measure is a change to this Methodology.

2.6.Publication, Errors and Cessation

The Kaiko Continuous Rates are published every 500 millisecond(s). Real-time values are not restated. Where an error is identified in a published value, the Index Team assesses its materiality, informs affected licensed users without undue delay and reports the incident to the Oversight Committee; corrected values are published for historical data only. The cessation of a rate follows the procedure in Section 7.4 of the Benchmark Transparency Statement.

3. Kaiko Continuous Capital Market Rates

3.1. Kaiko Continuous Equity Reference Rate

3.1.1. Stock & Exchange Traded Fund (ETF)

United States

U.S. equities and ETFs trade on National Market System (NMS) venues, principally the New York Stock Exchange (NYSE) and Nasdaq, in a continuous regular session with opening and closing auctions, extended by pre-market, after-hours, and overnight trading. It follows the published U.S. equity market holiday calendar.

Session		Hours (ET)	Primary Source
Business days			
	Early Hours	4:00 AM – 9:30 AM	Spot Price
	Regular Hours	9:30 AM – 4:00 PM	Spot Price
	Late Hours	4:00 PM – 8:00 PM	Spot Price
	Overnight Hours	8:00 PM – 4:00 AM	Spot Price
Weekend and holidays		Friday 8:00 PM – Sunday 8:00 PM	Perpetual Futures Price

Hong Kong

HKEX runs a morning and afternoon continuous session with a 1-hour midday break and a closing auction for cash equities. It follows the HKEX-published holiday calendar.

Session		Hours (HKT)	Primary Source
Business days			
	Regular Hours - Morning	9:30 AM – 12:00 PM	Spot Price

	Lunch Break	12:00 PM – 1:00 PM	Perpetual Futures Price
	Regular Hours - Afternoon	1:00 PM – 4:00 PM	Spot Price
	Closed market	4:00 PM – 9:30 AM next day	Perpetual Futures Price
Weekend and holidays		Friday 4:00 PM – Monday 9:30 AM	Perpetual Futures Price

Republic of Korea

In Korea, equities are traded continuously with a closing call auction. It follows the published local holiday calendar.

Session		Hours (KST)	Primary Source
Business days			
	Regular Hours	9:00 AM – 3:20 PM	Spot Price
	After Market	4:00 PM – 8:00 PM	Spot Price
	Closed market	8:00 PM – 9:00 AM next day	Perpetual Futures Price
Weekend and holidays		Friday 8:00 PM – Monday 9:00 AM	Perpetual Futures Price

Singapore

The Singapore Exchange (SGX) operates the cash-equity market. The cash market trades in SGD with a midday break and a 6-minute closing auction. It follows the SGX-published cash-equity market holiday calendar.

Session		Hours (SGT)	Primary Source
Business days			
	Regular Hours - Morning	9:00 AM – 12:00 PM	Spot Price

	Lunch break	12:00 PM – 1:00 PM	Perpetual Futures Price
	Regular Hours - Afternoon	1:00 PM – 5:00 PM	Spot Price
	Closed market	5:00 PM – 9:00 AM next day	Perpetual Futures Price
Weekend and holidays		Friday 5:00 PM – Monday 9:00 AM	Perpetual Futures Price

Japan

Tokyo Stock Exchange (TSE) trades cash equities in morning and afternoon sessions with a midday break and a closing auction. It follows the JPX-published holiday calendar.

Session		Hours (JST)	Primary Source
Business days			
	Regular Hours - Morning	9:00 AM – 11:30 AM	Spot Price
	Lunch break	11:30 AM – 12:30 PM	Perpetual Futures Price
	Regular Hours - Afternoon	12:30 PM – 3:25 PM	Spot Price
	Closed market	3:25 PM – 9:00 AM next day	Perpetual Futures Price
Weekend and holidays		Friday 3:25 PM – Monday 9:00 AM	Perpetual Futures Price

3.1.2. Equity Index Futures

Hong Kong

HKEX runs a morning and afternoon continuous session with a 1-hour midday break and a closing auction for cash equities. It follows the HKEX-published holiday calendar.

Session		Hours (HKT)	Primary Source
Business days			
	Regular Hours - Morning	9:30 AM – 12:00 PM	Calendar Future Price
	Market break	12:00 PM – 1:00 PM	Perpetual Futures Price
	Regular Hours - Afternoon	1:00 PM – 4:30 PM	Calendar Future Price
	Market break	4:30 PM – 5:15 PM	Perpetual Futures Price
	Late Hours	5:15 PM – 3:00 AM (next day)	Calendar Future Price
	Closed market	3:00 AM – 9:30 AM	Perpetual Futures Price
Weekend and holidays		Friday 4:00 PM – Monday 9:30 AM	Perpetual Futures Price

Republic of Korea

In Korea, equities are traded continuously with a closing call auction. It follows the published local holiday calendar.

Session		Hours (KST)	Primary Source
Business days			
	Regular Hours	9:00 AM – 3:45 PM	Calendar Future Price
	Break	3:45 PM – 6:00 PM	Perpetual Futures Price

	Late Hours	6:00 PM – 5:50 AM (next day)	Calendar Future Price
	Closed market	5:50 AM – 9:00 AM	Perpetual Futures Price
Weekend and holidays		Sat. 5:50 AM – Mon. 9:00 AM	Perpetual Futures Price

Singapore

The Singapore Exchange (SGX) operates the cash-equity market. The cash market trades in SGD with a midday break and a 6-minute closing auction. It follows the SGX-published cash-equity market holiday calendar.

Session		Hours (SGT)	Primary Source
Business days			
	Regular Hours (T session)	7:25 AM – 6:30 PM	Spot Price
	Break	6:30 PM – 6:45 PM	Perpetual Futures Price
	Late Hours (T+1 session)	6:45 PM – 5:15 AM next day	Spot Price
	Closed market	5:15 AM – 7:25 AM	Perpetual Futures Price
Weekend and holidays		Sat. 5:15 AM – Monday 7:25 AM	Perpetual Futures Price

3.2.Kaiko FX Continuous Reference Rate

Foreign exchange trades over the counter in the wholesale interdealer market, without a central exchange, on a continuous basis 24 hours a day, five days a week. Trading rolls across the Sydney, Tokyo, London, and New York sessions from the Sunday evening open to the Friday close, with a brief daily low-liquidity window around the 5:00 PM ET rollover. It follows the published holiday calendar of its relevant trading venue.

Session		Hours (ET)	Primary Source
Business days			
	Regular Hours	6:00 PM – 5:00 PM (next day)	Spot Price
	Low-liquidity hours	5:00 PM – 6:00 PM	Spot Price
Weekend and holidays		Friday 5:00 PM – Sunday 6:00 PM	Perpetual Futures Price

3.3.Kaiko Commodity Reference Rate

Gold / Silver

Gold and silver trade over the counter in the wholesale interdealer spot market, without a central exchange, on a continuous basis 24 hours a day, five days a week across the Asian, London, and New York sessions, with a brief daily low-liquidity window around the 5:00 PM ET rollover. It follows the published holiday calendar of its relevant trading venue.

Session		Hours (ET)	Primary Source
Business days			
	Regular Hours	6:00 PM – 5:00 PM (next day)	Spot Price
	Low-liquidity hours	5:00 PM – 6:00 PM	Spot Price
Weekend and holidays		Friday 5:00 PM – Sunday 6:00 PM	Perpetual Futures Price

Brent/WTI/Europe Natural Gas (TTF)

Brent crude, WTI crude, and European natural gas (TTF) are priced from one-month flat-price swaps traded over the counter in the wholesale interdealer market, without a central exchange, on a continuous basis 24 hours a day, five days a week, with a daily overnight low-liquidity window. Each contract follows the published holiday calendar of its relevant trading venue.

Session		Hours (GMT)	Primary Source
Business days			
	Regular Hours	1:00 AM – 7:30 PM	Spot Price
	Low-liquidity hours	7:30 PM – 1:00 AM (next day)	Perpetual Futures Price
Weekend and holidays		Friday 7:30 PM – Monday 1:00 AM	Perpetual Futures Price

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