



SMM Copper Concentrate Index

2020/5/8

Assessment Methodology and specifications

● About Shanghai Metals Market

Shanghai Metals Market (SMM) is an integrated business information agency of commodity pricing and big data services. SMM's portfolio of businesses include price assessment reports and analysis and key information database of nonferrous metals, as well as customised consulting projects and industry conferences.

SMM's big data department provides extensive support for market research, price forecast and consulting services. Prices indices generated from the big data system are widely used in physical and paper trades in the commodities industry.

Price assessments for China's spot market ("SMM price/index") are published on a regular basis, which strictly adhere the International Organization of Securities Commissions (IOSCO) standards and a specific assessment methodology. SMM, an independent third party agency, interact with market participants on a regular basis, and the price assessment methodology is constantly reviewed according to most common product specifications, trade terms and conditions.

The SMM price/index provides a reference benchmark to business owners, which helps them in trading cost reduction and market risk aversion, so as to achieve higher standards in the nonferrous metals market.

● Guidelines to SMM spot copper concentrate index assessment methodology

The SMM copper concentrate index reflects the spot price of copper concentrate at Chinese smelters on a weekly basis. The document specifies the calculation model for SMM copper concentrate index as well as the collection and processing processes of trade sample data in accordance with IOSCO standards, in pursuit of fair and accurate presentation of transactions in China's spot copper concentrate market. It also creates an accurate, transparent and verifiable mechanism for the assessment of the index.

To reflect the actual trades in the SMM copper concentrate spot market on an unbiased basis, SMM produces the benchmark data based on historical data collected through market survey.

SMM copper concentrate index

Benchmark	Spot price of copper concentrate at Chinese smelters	Remarks	Benchmark	Highest	Lowest
Unit	USD/mt(Treatment charges) , cents/lb(refining charges)	Cu%	25	38	18
Quantity	around 5,000 mt	Au(g/dmt)	1.1	30	0
Delivery time	Within 3 months	Ag(g/dmt)	75	400	0
Delivery terms	letter of credit at sight	S(%)	32	40	20
Publishing time	Every working Friday	Fe(%)	28	35	12
SMM copper concentrate index is produced on the basis of the price methodology of copper concentrate TCS. The assessment methodology will be revised from time to time to reflect the latest trading trends of the spot copper concentrate market. For any queries, please contact us at copperconcinde@smcn.cn		Pb(%)	0.1	4	0
		Zn(%)	1	5	0
		As(%)	0.2	0.5	0
		Sb(%)	0.02	0.2	0
		Hg(ppm)	2.5	10	0
		Bi(ppm)	150	2000	0

● Data Collection

Data Source

Data source is a key basis as the SMM copper concentrate index is calculated based on spot trade data. The analysts conduct detailed market survey from miners, traders and smelters in the market, collecting trade information that adheres to our standards (accurate and valid data and information) to build the SMM copper concentrate price index. This include actual traded spot prices, as well as quotes by sellers and offers by buyers that fail to conclude a deal. The data is collected from SMM's price contributors and key market participants who are not incorporated in our price contributors list for the time being.

A data collection and assessment team (which comprises of two sub-teams and a price manager) has been set up to manage the daily management of the SMM copper concentrate index.

Data utilisation

SMM decides whether to incorporate a specific deal in the database for calculation as per the SMM copper concentrate index standards to ensure data integrity and accuracy. The standards specify the parameter information required in data provided by market participants, including brand name, copper concentrate type, element content, trading volumes, pricing mechanism and other information that can affect the spot price.

SMM copper concentrate index is generated by normalising and weighing the average of the collected data, limiting the trading parameters, including the minimum trading volume and brand, to avoid any disturbances of small-volume transactions and abnormal trading on the index. Only transaction data that meets the limitation will be included in the calculation of the SMM copper concentrate index.

Data collection standards

Analysts collect transaction data from the physical market on each trading day by phone, Wechat messaging, email, and data submission via the Internet. All data collection work will be completed before 12:00 China Standard Time (CST) on the date of index publication, and data collected after the timestamp will be used for the next terms assessment.

All trade information will be treated as confidential and made accessible only to price reporters and index calculators. SMM requires all contributing companies to sign a formal agreement in order to ensure the accuracy and timeliness of the data provided. The agreement also protects the anonymity of the company's trade information. SMM will review, on a regular basis, the activities and the data provided by the contributors, to ensure they can provide reliable price data. SMM reserves the right to exclude a contributor from participating in the market survey process if the company intends to mislead the price assessment by providing inaccurate price information.

Data collection in inactive market

Actual spot transaction data is prioritised in SMM data collection as the SMM copper concentrate index aims to reflect actual trades in the copper concentrate physical market.

In case that the volume of actual transaction data available falls below five trades in a week due to an inactive market, SMM will supplement the dataset by collecting quotes or valuation provided by contributing companies including miners, traders, and smelters. The weightage of trade data and price assessment in the calculation of copper concentrate index will be illustrated below.

● Calculation

The SMM copper concentrate index is intended to reflect the trades of the copper concentrate spot market on a weekly basis, in a fair and reasonable manner, and provide a reference value based on the SMM copper concentrate spot trading benchmark data. Calculation methods include transaction data normalisation, abnormal data processing, and calculating under special circumstances, to ensure the functionality of this methodology.

Normalisation

SMM normalises the collected qualified data according to its internal data processing model. This involves determining a standard for SMM copper concentrate index based on historical import data of copper concentrate in China, normalising the collected data according to its deviation from the standard by using adjustment factors, and weighting average the normalised data based on the trading volume.

The brand of the copper concentrate is the key adjustment factor in the normalisation process. In the internal model, SMM determines the difference in transaction prices between the major copper concentrate brands and the copper concentrate benchmark model. We also update the difference value regularly to ensure that it meets the actual trading situations of the copper concentrate market. Each piece of trading information will be normalised in terms of the brand adjustment factor to contribute to the SMM copper concentrate index.

Counterparty buyer will also be taken into account in the normalisation process as traders and smelters provide different quotations for copper concentrate TC based on their own needs.

According to common cases in the copper concentrate trading market, SMM sets the benchmark quotational period at three months (M+3). Data under other types of quotational periods such as four months (M+4) will be normalised by using LME's future forward curve.

Normalisation for quoted and evaluated prices offered by contributing companies will be based on the nature of the contributors and prices.

Criteria to discard pricing data

The preliminary copper concentrate index is the weighted average calculated from normalised data screened and collected by SMM analysts. Data which is greater than 10% from the preliminary index will be excluded.

The filtered set of data will be used to calculate a weighted average to be the final SMM copper concentrate TC assessment. SMM will investigate the abnormal data to check for price manipulation.

Method of calculation

The calculation model of SMM copper concentrate index divides the copper concentrate spot market into three situations: active, relatively inactive and flat (no transactions).

The spot market will be considered as active when there are 5 or more trades over the week of assessment, and the SMM copper concentrate index will be calculated by weighted average of the normalised trade data.

When there are 1-4 trades done on a weekly basis, the spot market will be recognised as relatively inactive, and the SMM copper concentrate index will be calculated from normalised trade data and valuation. The weighted average value of normalised trade data will be given a weightage of 30%, while the weighted average value of valuation will be given a weightage of 70%.

SMM will deem no trades in the spot market in case of a lack of eligible transaction data for the

week, and the standardised quotation/price valuation will be given equal weightage, and the SMM copper concentrate index will be obtained by taking the average.



Avoiding the impact of large-volume transaction on the index

In order to avoid the transaction of a single SMM copper concentrate index data provider from having an impact on the index, which may result in the deviation of the SMM copper concentrate index from the actual spot market situation, the weightage for calculation will be adjusted accordingly when SMM finds in the process of index calculation that the transaction data provided by a single data provider exceeds 25% of the total weightage of the SMM copper concentrate index.

The weightage of the price data provided by the data provider will be reduced to 25%, and the weightage of other transaction data for the week will be reduced accordingly according to proportion. Correspondingly, SMM will introduce a price valuation mechanism or increase the weightage of the price valuation mechanism for the week, so that the index calculation weightage for the week adds up to 100%.

● Publication

Publishing timeline

The SMM copper concentrate index is published on working Friday, or the last trading day of the week if Friday is a public holiday. Please refer to the statement by the Chinese government on official websites for the holiday schedule.

Index review

In order to ensure the consistency of SMM copper concentrate index methodology and internal computation model in practical application and avoid the deviation of the SMM copper concentrate index calculation caused by human error, SMM will carry out strict internal control procedures ahead of the index publication.

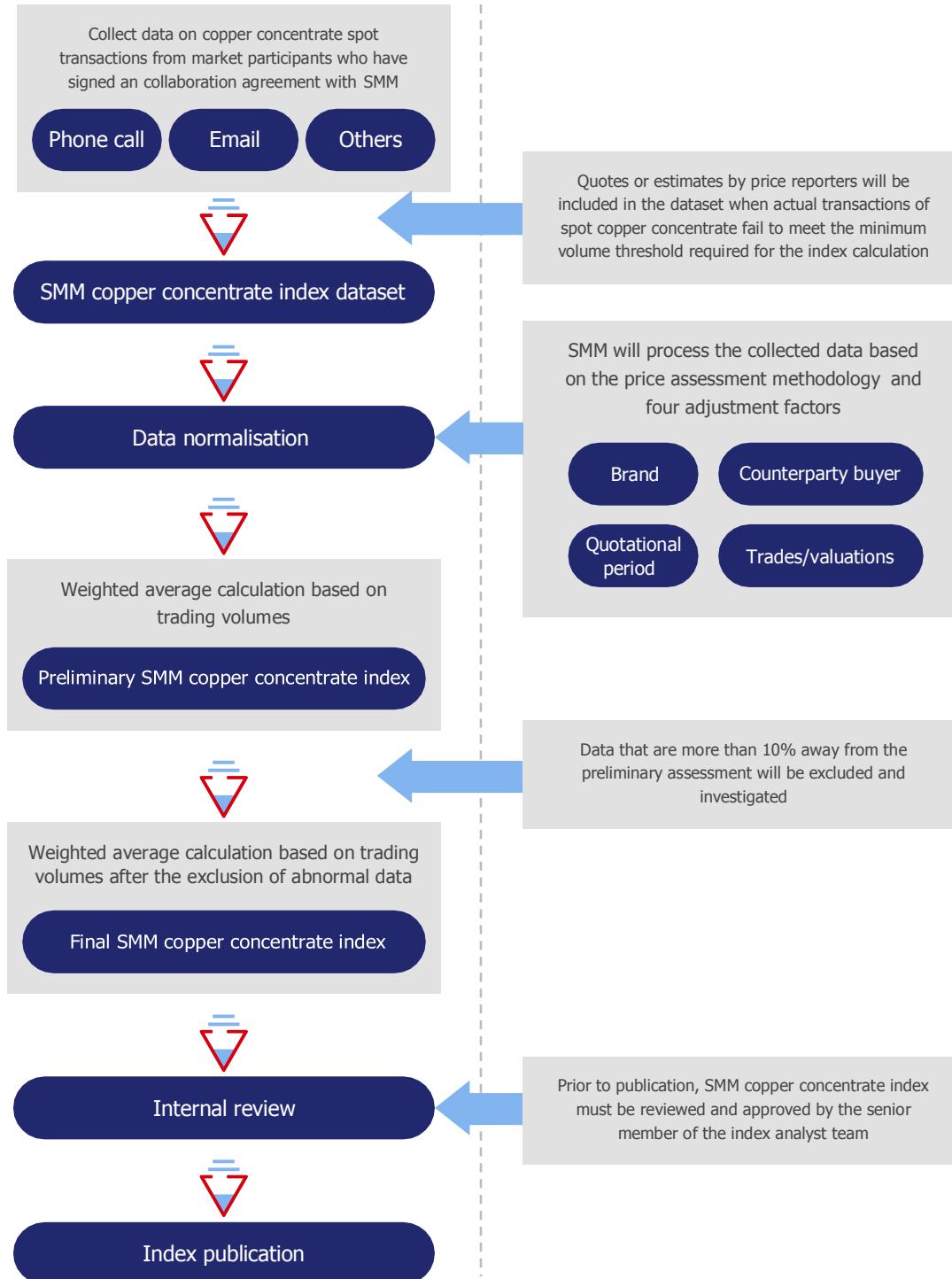
Prior to the release, the assessed spot copper concentrate TCs must be reviewed and approved by a senior member of the index analyst team. In the review process, the reviewer must check whether the price methodology and the internal calculation model are correctly applied in the full process of assessing spot copper concentrate TCs to ensure the accuracy and integrity of the index published on our websites. In addition, all data input and calculation details will be stored in the SMM backend database for review purposes.

Publication delay and index revision

SMM will inform all subscribers of the SMM copper concentrate index of the delay of publication. Publication delay will not include transactions happened after CST 12:00 on the day for the index assessment, as the data source will remain unchanged. Errors in the published index will be corrected and updated on the websites and notifications sent to subscribers.

● Adjustment to the index assessment methodology

SMM will update our methodology to reflect a constantly changing spot copper concentrate market. Amendments will be made based on feedback by market participants, and will go through an internal review by SMM. All revisions and updates will be published on our websites for public comments for at least 30 days, before the release of a finalised version of the assessment methodology. SMM will inform subscribers of SMM copper concentrate index of the changes in the methodology and when the new version will take effect.



● **Contact**

For queries, please contact

Logan LU

+86 02151595830

loganlu@smm.cn

Jianhua YE

+86 02151666848

yejianhua@smm.cn

Vyron CHEN

+86 02151666843

Vyronchen@smm.cn