

BOCI Index Index Methodology

*Guangdong-Hong Kong-Macao Greater Bay Area
Equity Index Family*

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1. Guangdong-Hong Kong-Macao Greater Bay Area Equity Index Family

The Guangdong-Hong Kong-Macao Greater Bay Area (GBA) Equity Index Family is part of the BOCI Index Series. There are other index families under the same series, please refer to the other BOCI Index Methodology for detail.

2. Index Universe

In general, the equity universe for the GBA index family comprise of securities primarily listed on the Main board of the Stock Exchange of Hong Kong (HKEx), the Shanghai Stock Exchange (SSE), the Shenzhen Stock Exchange (SZSE) and American Depositary Receipts of Chinese companies listed on New York Stock Exchange, NASDAQ Exchange, or NYSE American in the United States.

International Cross-Market Universe:

- Place of listing: Hong Kong, Mainland China (SSE and SZSE) and the United States (New York Stock Exchange, NASDAQ Exchange, or NYSE American)
- HK listed: Trade in HKD and listing on main board of HKEx-- ordinary shares, business trust, Stapled securities and HDRs.
- Mainland China listed: A share securities eligible under either Shanghai or Shenzhen Northbound stock connect scheme
- US listed: American Depositary Receipts (ADRs) of Chinese companies listed on New York Stock Exchange, NASDAQ Exchange, or NYSE American in the United States.
- Security classified under GBA

The following table indicates the universe use for each specific GBA indexes:

Index Name	Universe
BOCI GBA Leaders Index	International Cross-Market Universe

3. Classification of Index Universe

3.1. GBA Indexes

Security is classified under the Greater Bay Area (GBA) universe after considering a number of criteria, including:

- The city where the company's headquarter is located
- Geographic location of the company's operation
- Geographic distribution of the company's revenue and assets
- The company's history
- The city in which investors consider the company to be most appropriately classified

For company located in GBA but with low share of sales and business operations originate from Mainland China, HKSAR and Macao SAR would be excluded from the GBA universe.

Cities that are considered for Greater Bay area: The Hong Kong Special Administrative Region (HKSAR), the Macao Special Administrative Region (Macao SAR) as well as the municipalities of Guangzhou, Shenzhen, Zhuhai, Foshan, Huizhou, Dongguan, Zhongshan, Jiangmen and Zhaoqing in Guangdong Province.

3.2. BOCI Greater Bay Area Leaders Index

BOCI GBA Leaders Index is a combination of four themes, namely Advanced Manufacturing, Strategic Emerging Industries, Modern Service Industries and Modern Transport System and Construction. Each theme carries each index weighting (i.e. 25%) and is reset at each index review.

Advanced Manufacturing: This theme includes, but not limited to companies in the industry of advanced and high-end manufacturing such as automation, intelligent manufacturing, high-end manufacturing, advanced equipment manufacturing, and high-speed and high precision processing equipment. Companies in the industry of automobiles, home appliances, equipment manufacturing and electronic information are also covered.

Strategic Emerging Industries: This theme includes, but not limited to companies in the emerging industries such as information technology, biotechnology, pharmaceuticals, high-end medical equipment, genetic testing, modern Chinese medicine, new materials, communication technology and semiconductors. Companies in the industries of digital economy & sharing economy, animation, comics & games, internet & digital culture and e-commerce are also covered.

Modern Service Industries: This theme includes, but not limited to companies in the service industries such as finance, gaming & leisure, professional services, healthcare services, education, logistics services and media, film & television.

Modern Transport System and Construction: This theme includes, but not limited to companies in the area of air transportation, marine, railroads, highways, ports, airports, engineering & construction, construction material and building products.

3.3. Index universe classification review

Classification of each index universe is reviewed once a year and review result will be implemented together with the annual index review.

4. Index Constituent Selection

For securities in the GBA universe to be eligible for inclusion as index constituent, in general it has to satisfy a number of criteria, including but not limited to:

1. Minimum length of listing history
2. Liquidity criteria
3. Trading suspension
4. Free float market capitalization ranking*
5. Foreign ownership limit

*Float factor used in ranking float market cap is domestic free float factor

For cross-market indexes (e.g. covering both HK listed securities and Mainland China listed A share) constituents is selected based on company level free-float adjusted market capitalization (float market Cap) rather than security level float market cap. For example, if a company has both A and H share classes listing on Mainland China and Hong Kong, respectively, then the combined float market cap of both A and H share classes will be use to represent the float market cap of the company. If the company only has one listed share class, then this listed share class's float market cap will be use. For BOCI China A Share Index, it is a single market index covering only China A share, hence all ranking is on A share securities level.

Companies will be ranked against each other based on their float market cap. If a company is selected as index constituent, security under each listed share class will be consider for inclusion (i.e. both A and H share), subject to constituent selection criteria.

The exact criteria may vary from index to index. Some thematic or standalone index may not include all the above criteria.

4.1. Minimum Listing History

All securities must have over 3 months of trading history (at the index review reference data date) to be eligible for inclusion (except for mega IPOs for fast entry, spin-offs and other corporate action related events).

4.2. Liquidity Criteria

For securities in the index universe to be eligible as index constituents, one of the conditions is to meet the liquidity criteria. Liquidity is measured by the median value traded ratio (MVTR). Both 12-months MVTR and 3-months MVTR were used to assess both the long term and short term liquidity condition of a security. For indices with special theme or weighting scheme, its measure of liquidity may adopt a different definition as appropriate.

For GBA equity index family, to be eligible for index inclusion, the subject security needs to have a minimum of 15% 12-months MVTR and 15% 3-months MVTR. Existing constituents with both 12-months and 3-months MVTR fall below 10% will be taken out at semi-annual or annual index review.

For large IPOs (mega IPO) that have less than three months of listing history, if it meet the fast entry requirement for index inclusion during index review, such stocks do not have to subject to liquidity screen.

During semi-annual and annual index review, for constituent companies that are passively added to the index during the last quarter due to corporate actions (e.g. Spin offs...etc.):

- If the company is ranked at or above top Nth by free float adjusted market capitalization, they are not subject to liquidity.
- If the company is ranked below top Nth by free float adjusted market capitalization, they are only subject to 12-month MVTR liquidity screen.
- N value for each specific index is listed below:

Index	N Value
BOCI GBA Leaders Index**	7

**For BOCI GBA Leaders Index, it refers to the ranking within each theme

The definition of MDVT and MVTR follows the BOCI Index Series index methodology for Standard Market Equity Index Family. For details, please refer to the methodology.

4.3. Trading Suspension and other Criteria

- Non constituent securities that are suspended during index review will not be considered for inclusion unless it has announced its trade resumption date for further review.
- Long period trading suspension: Existing constituents with trading suspensions of 60 consecutive trading days or more will be subject to review of potential index deletion during index review.
- China A share securities that is under special treatment (i.e. ST/*ST) is not eligible for index inclusion.

4.4. Free float adjusted market capitalization ranking

The GBA indexes are based on ranking of free float adjusted market capitalization on companies in the index universe. Domestic free float factor is used for this float market cap calculation.

4.5. Foreign Ownership Limit

For any non-constituent China A share securities, if its total foreign ownership is at or above 26% of total share issued it will not be eligible for index inclusion (International indexes only). Such criterion does not apply to indexes under the domestic cross-market universe or domestic China universe.

5. Number of Index Holdings

The number of constituents for each index is determined by balancing the degree of market representation and ease of replication in real life portfolio. For GBA equity index family, the target is in terms of companies instead of securities. It target either fixed number of companies or companies' free float adjusted market cap coverage. As a company may have more than one listed share class, the number of securities included into the index may exceed the number of companies.

Index	Target	Target Number
BOCI GBA Leaders Index	Number of companies within each theme	10 per theme

The number of company may deviate from the numbers stated above due to corporate action / events (e.g. spin off, M&A...etc.), which will be reviewed during index review.

For specific securities / cases where the above guidelines cannot be applied, or are considered inappropriate, BOCI would conduct further study that may include other factors or considerations to determine an appropriate treatment.

6. Weighting Scheme

Constituent in general is weighted by its free float adjusted market capitalization.

For A share there are two sets of free float factors, domestic free float and foreign free float. Foreign free float factor takes into account of the foreign ownership limit, which is currently 30% for China A shares (subject to Chinese government policy changes). Different indexes within the GBA equity index family use different float factor for index weighting calculation, the below table indicate the float factor use for each index.

6.1. Free Float Factors for China A Shares

Index	Free Float Factor for index weight calculation
BOCI GBA Leaders Index	Foreign

6.2. Capping

Index weight capping on individual company is 10% at each index review. For example, if a company has dual listed share class (e.g. A+H), its combined index weighting across both share classes is capped at 10% on each index review. If the constituent company (with multiple listed share classes) only has one share class eligible for inclusion (due to reasons, including but not limited to liquidity, suspension and listing history) then the capping applies on the security level. Between index reviews, the weightings will be allowed to drift according to price fluctuations.

6.3. BOCI GBA Leaders Index

The GBA Leaders index is composed of four individual themes:

Themes	
1	Advanced Manufacturing
2	Strategic Emerging Industries
3	Modern Service Industries
4	Modern Transport System and Construction

Each theme carries equal weighting within the index (i.e. 25% weighting for each theme) and such theme weighting is reset quarterly at each index review. Within each theme, security is weighted by its free float adjusted market capitalization. Index weighting is capped at 40% within each theme for each company (equivalent to 10% at index level) at each index review. If the constituent company (with multiple listed share classes) only has one share class eligible for inclusion (due to whatever reason, including but not limited to liquidity, suspension and listing history) then the capping applies on the security level. Between index reviews, the weightings will be allowed to drift according to price fluctuations.

7. Regular Index Review

In general, BOCI indices are review every three months. There are quarterly index review, semi-annual index review and annual index review.

7.1. Index review date

In general index rebalancing is effective at the open on the fourth Wednesday in the month of January, April, July and October. BOCI may change the rebalancing date for reasons including market holidays occurring on or around the scheduled rebalancing date. Any such change will be announced with advance notice where possible.

Annual index review is at October while semi-annual index review is at April. January and July are quarterly index review. Outside of quarterly index review, BOCI has full discretion to make ad-hoc index review when it is deemed to be necessary to allow the index to better represent the market.

7.2. Quarterly Index Review

- Mega size IPO over the past quarter will be review, if any, for potential fast entry:
 - For cross-market indexes, fast entry only considers IPO of company with no existing listed share class in the index universe. If a company already has a listed share class within the index universe and there is an IPO of a new share class (e.g. existing H-share listing and new A-share IPO) then it will not be consider for fast entry. For existing index constituent with a new share class IPO, the new share class will be consider for inclusion at semi-annual or annual rebalancing subject to constituent selection criteria.
 - Those recent IPO companies that rank top Yth by float adjusted market capitalization within the index universe. The Y value for specific index is listed below table.
 - With the addition of mega size IPO into the index, the smallest float adjusted market cap constituent company will be deleted to give space to the addition to bring the number of company back to the designed level.
 - In the case of Leaders Index, the Y value refers to the company rank within each theme.

Index	Y Value
BOCI GBA Leaders Index*	5

*The rank level within each theme

- To refresh the capping factor for individual company for all indexes.
- For GBA Leaders Index, reweight each theme back to equal weight.
- To update free float factor and number of shares issued.
- To consider addition or deletion of constituents to bring the number of companies back to stated number for each index
- Other monthly changes resulting from changes in stock connect eligibility list and ST/*ST status will be implemented together with the regular index review

7.3. Semi-annual Index Review

- Full rebalancing to select index constituents with index universe that include both recent mega size IPOs (fast entry) and other large IPOs if it meets the inclusion criteria.
- To refresh the capping factor for individual company.
- For GBA Leaders Index, reweight each theme back to equal weight.
- To update Free float factor and number of shares issued
- Mega size IPO fast entry (with listing history less than 3 months): same as quarterly rebalancing.

- Entry & Exit buffer rule: This rule is design to reduce index turnover due to short term price fluctuation.
 - A buffer zone is set around the number of index company number (Z). For existing index constituent companies with free float adjusted market capitalization ranking that fall within top Z+X ranking, it will generally be kept as index constituent during semi-annual and annual index review. For non-index constituent companies with free float adjusted market capitalization ranking at or below top Z-X number ranking it would remain as non-index constituent company. For example, if the index constituent company number Z is 80 companies and X is 8 then existing constituent companies that rank within top 88 by float adjusted Market Cap would be kept. For eligible non-index constituent companies, it needs to rank above 72 in order to be considered for inclusion.
 - For Leaders Index, both the Z and X value refers to within each theme rather than the combined index.
 - The Z and X value for specific index is listed below.

Index	Z Value	X Value
BOCI GBA Leaders Index*	10	0

* The buffer rule applies at the theme level

7.4. Annual Index Review

Similar to Semi-annual index review but based on a refreshed universe after review of stock classification and new listings.

7.5. Details of Entry/Exit buffer rule

For Indexes that target fixed number of companies:

- The buffer rule is designed to reduce the entry/exit of index constituents due to minor price movement at the margin.
- When the number of entry companies < number of exit companies as proposed under the buffer rule, the largest proposed deletion(s) (by free float adjusted market cap) will be kept in the index instead to maintain the number of constituent company and to minimize index turnover.
- When number of entry companies > number of exit companies as proposed under the buffer rule, the smallest proposed addition(s) (by free float adjusted market cap) will not be added to the index as to maintain the number of constituent company and to minimize index turnover.

8. Ad-hoc Index Adjustment

8.1. Stock-Connect Scheme Eligibility List

Changes in Northbound stock connect eligible list:



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中銀國際系列指數
BOCI Index Series

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- Any deletion of index constituent result from changes in stock connect eligibility list is to be implemented on a monthly basis. That is, for existing constituents, if it is access through stock connect scheme and if the security become ineligible for stock connect then it will be remove from the index on a monthly basis.
- For Northbound stock connect:
 - For months that coincide with regular index review, any changes in the stock connect eligibility will be implemented together with the index review.
 - For other months, stock removed from stock connect eligibility list will be review and implemented after the close of the third Friday of every month (data cutoff date=4 trading days before implementation).

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