



中華證券交易服務有限公司

CHINA EXCHANGES SERVICES  
COMPANY LIMITED

# **CES Index Calculation and Maintenance Methodology**

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## Contents

1. Regular Review and Periodic Share Adjustments of Indices.....	- 2 -
2. Index Constituent Adjustments.....	- 5 -
3. Index Calculation.....	- 9 -
4. Index Maintenance.....	- 12 -
5. Maintenance of Constituent Shares and Capping Factor Adjustments .....	- 14 -
6. Amendments and Supplements to Index Methodology .....	- 15 -
7. Information Disclosure .....	- 15 -
8. Index Dissemination .....	- 16 -
Appendix A: Free Float.....	- 18 -
Appendix B: Definition.....	- 20 -
Contact Us.....	- 22 -

# 1. Regular Review and Periodic Share Adjustments of Indices

Constituents of CES indices are reviewed every 6 months. Constituents and constituent weights are adjusted following to the regular review.

## 1.1 Review Period

CES indices are adjusted and rebalanced semi-annually. The index reconstitution and float share adjustments are implemented after the market close on the second Friday of each June and December (“Review Effective Date”).

## 1.2 Data Used for Regular Review

Data used for June review includes trading data and financial data from 1<sup>st</sup> May of the previous year to 30<sup>th</sup> April of the review year (in case of an IPO, data since its fourth trading day are used). Data used for December review includes trading data and financial data from 1<sup>st</sup> November of the previous year to 31<sup>st</sup> October of the review year (in case of an IPO, data since its fourth trading day are used).

## 1.3 Float Share Adjustments

Free float shares adjustment for CES indices is reviewed semi-annually. The adjustment will be implemented after the market close on the second Friday of June and December. See Rule 3.3: “Free Float”, Rule 3.5: “Category-Weight Method” and Section 5: “Maintenance of Constituent Shares and Capping Factor Adjustments”.

## 1.4 Buffer Zone

To minimize index turnover, a buffer zone rule is employed to certain CES indices during the reconstitution. For example, candidate stocks of CES A80 rank within the top 64 will have the priority to be added into the index and the existing constituents ranking within the top 96 will also have the priority to be retained in the index. If the application of the buffer zone rule has resulted in having more than 80 constituents, then the existing constituents with the lowest ranking will be removed from the index. On the contrary, if the application of the buffer zone rule has resulted in having less than 80 constituents, the candidate stocks with the highest ranking will be added into the index.

## 1.5 Reserve List

In order to enhance the predictability and transparency of non-regular index reconstitution, certain CES indices adopt a reserve list policy which is used to implement non-regular index reconstitution between regular reviews.

- The reserve list is created for each regular review of index constituents.
- If non-regular index reconstitution is required (due to delisting, merger, etc.) leading to a vacancy in constituent stocks, the highest ranking stock on the reserve list will be added to the index.
- When the number of stocks on the reserve list is less than 50% of the original number, candidate stocks will be added to the respective reserve list. CESC and CSIC will then publish the new reserve list in a timely manner.

## 1.6 Long Suspension Stocks

**Existing index constituents.** Index constituents that have been suspended during the review period:

- Constituents that have been suspended for 3 months or more and have not resumed trading as of the Review Cutoff Date will be classified as candidate for removal.
- Constituents that have been suspended for close to 3 months as of the Review Cutoff Date may be considered as candidate for removal.
- Constituents that had been suspended for 3 months during the review period but have resumed trading will be retained in the index in principle if they meet the criteria.

**For stocks not included in the index.** Stocks that are not index constituents and have been suspended during the review period:

- Stocks that have been suspended for 3 months or more and have not resumed trading as of the Review Cutoff Date will not be selected as candidate.
- Stocks that have been suspended for close to 3 months as of the Review Cutoff Date may be considered as candidate.
- Stocks that have been suspended for 3 months or more during the review period can be included in the index only if trading has been resumed for 3 months.

## 1.7 Stocks Experienced Financial Losses

During regular review of constituents, A-shares that experiences losses as reported in financial statements will, in principle, be ineligible candidates unless the stock exerts great impact on the representativeness of index.

## 2. Index Constituent Adjustments

When special events or change in security eligibility occur affecting the representativeness and investability of the indices, requisite non-regular adjustments will be made to the index constituents.

### 2.1 Treatment of IPOs & Newly Added Eligible Securities for “Stock Connect”

For CES A80 and CES 300 Northbound Trading under Shanghai Connect and Shenzhen Connect: Following comparison of the total market capitalisation of an IPO (or newly added eligible securities for Stock Connect) to the daily average market capitalisation of all other A Share of the year ended on the listing announcement date, if an IPO (or newly added eligible securities for Stock Connect) ranks among the top 10 and is eligible for index universe, then fast entry rule will apply. (The fast entry rule will not be applicable for the stock listed on ChiNext of SZSE) The IPO (or newly added eligible securities for Stock Connect) will be added to the relevant index after the market close on its tenth trading day. Simultaneously, the constituent with the lowest ranking by daily average market capitalisation during the relevant period will be removed from the index.

For CES HKMI, CES SCHK100 and CES 300 Southbound Trading under Stock Connect: Following comparison of the total market capitalisation of an IPO (or newly added eligible securities for Stock Connect) to the daily average market capitalisation of other HK securities of the year ended on the listing announcement date, if an IPO (or newly added eligible securities for Stock Connect) ranks among the top 10 and is eligible for index universe, then fast entry rule will apply. The IPO (or newly added eligible securities for Stock Connect) will be added to the relevant index after the market close on

its tenth trading day. Simultaneously, the constituent with the lowest ranking by daily average market capitalisation during the relevant period will be removed from the index.

When the fast entry rule applies to CES A80 or CES HKMI, CES 120 will make corresponding change. Constituent removed from CES 120 will be included in CES 280 Index.

If an IPO (or newly added eligible securities for Stock Connect) meets the criteria of fast entry but the time gap between its date of listing and the next Review Effective Date is less than 20 trading days, then the fast entry rule will not apply. The IPO (or newly added eligible securities for Stock Connect) will be added to the index on the next Review Effective Date.

## 2.2 Merger and Acquisition

- Two constituent companies merge: The resulting new company will remain qualified as constituent. The vacancy created will be filled up by the highest ranking stock in the reserve list.
- One constituent company and one non-constituent company merge: The resulting new company will remain qualified as constituent. If the new company is ineligible for the index universe, then the highest ranking stock in the reserve list will replace the new company as constituent in the index.
- One non-constituent company acquires or takes over another constituent company: If the resulting new company ranks higher than the highest ranking stock in the reserve list, then the new company will be added to the index. Otherwise, the highest ranking stock in the reserve list will be added to the index. If the new company is ineligible for the index universe, then the highest ranking stock in the reserve list will be added to the index (notwithstanding

the new company has a higher ranking).

- Merger, spin-off, acquisition and restructuring of non-constituents: If the total market capitalisation of the resulting new company ranks among the top 10 in the A Share market or HK securities market, then fast entry rule will apply. Otherwise, these corporate events will be considered at the regular review.

## 2.3 Spin-off

If a constituent company is spun off to form two or more companies, whether the resulting companies are eligible for inclusion in the index will depend on their rankings.

- If the resulting companies rank higher than the lowest ranking constituents, then the resulting companies will replace the lowest ranking constituents in the index. If the resulting companies are ineligible for the index, the highest ranking stock in the reserve list will be added to the index.
- If some of the resulting companies rank higher than the lowest ranking constituent, then those resulting companies will replace the lowest ranking constituent in the index. If that resulting company is ineligible for the index, the highest ranking stock in the reserve list will be added to the index.
- If all of the resulting companies rank lower than the lowest ranking constituent, but some or all of the resulting companies rank higher than the highest ranking stock in the reserve list, then the highest ranking resulting company will replace the original constituent company in the index. If the highest ranking resulting company is ineligible for the index, the highest ranking stock in the reserve list

will be added to the index.

- If all of the resulting companies rank lower than the lowest ranking constituent and the highest ranking stock in the reserve list, then the highest ranking stock in the reserve list will be added to the index.

## 2.4 Suspension

If a constituent is suspended from trading, the decision to remove it from the index will base on the reasons for suspension.

## 2.5 Listing Suspension and Delisting

If a constituent company is suspended from listing or delisted from the market, it will be removed from the index and replaced by the highest ranking stock in the reserve list.

## 2.6 Bankruptcy

If a constituent company enters into bankruptcy proceedings or is adjudged bankrupt, it will be removed from the index and the highest ranking stock in the reserve list will be added to the index.

## 2.7 Stock Classified as Eligible for Sell Only under “Stock Connect”

For indices comprised of eligible securities for Stock Connect, if a constituent company is classified as eligible for sell only or removed from “Stock Connect”, it will be removed from the index and replaced by the highest ranking stock in the reserve list.

### 3. Index Calculation

CES indices are calculated to 4 decimal points. The foreign exchange rate used in the index calculation adopts the foreign exchange rate provided by information vendors commonly used in the market which has been affirmed by the index compiler. The foreign exchange rate from Thomson Reuters (mid-price of quote) is currently used to calculate the index.

#### 3.1 Index Real-time Calculation

The real-time index calculation is based on the traded price data issued by the trading systems of the relevant stock exchanges via various channels. The real-time index is calculated during the trading hours of any of the exchanges on which an index constituent is listed.

- The opening index is calculated on the basis of the opening price (of the index constituents) obtained through the daily aggregate auction. If there is no transaction, the opening index is then calculated by using the reference opening price supplied by the quotation system.
- The index is calculated until the close of trading.

**Price of each constituent (X)** is defined on the following principle: If there is no transaction for the whole trading day, X means the reference opening price, otherwise, X means the last traded price.

#### 3.2 Index End-Of-Day Calculation

The end-of-day index calculation is based on the traded price data issued by the trading systems of the relevant exchanges via various channels. The end-of-day index is calculated after the trading hours of all of the exchanges on which an index constituent is listed.

### 3.3 Free Float

To reflect the price fluctuation of the real negotiable shares in the market, CES indices adopt free float shares (Free Float) for index calculation and exclude non-negotiated shares caused by strategic holdings, government holdings, etc.

- (1) **Long term holdings by founders, their families and senior executives of the company**
- (2) **Government holdings**
- (3) **Strategic holdings**
- (4) **Frozen shares subject to lock-up period**
- (5) **Restricted employee shares**
- (6) **Cross holdings between/among listed companies**

### 3.4 Identification of Free Float

(1) Restricted shares subject to lock-up period are deemed as non-free float.

(2) For non-restricted shares, the shares are deemed as non-free float if the shareholding held by shareholders classified under any of the six categories above together with persons acting in concert exceeds 5%. Any shareholdings, including any of the above six categories of less than 5% is treated as free float.

(3) Restricted shares after the lock-up period are treated as non-restricted shares.

$$\text{Free Float} = \text{Total number of shares} - \text{Non-free float shares}$$

Further provisions on Free Float are set out in Appendix A.

### 3.5 Category-Weight Method

A **Category-Weight** Method, which can minimize the variability of constituents shares adopted for index compilation, is used to weight number of shares of index constituents. An Inclusion Factor is assigned to each share based on the percentage of Negotiable Market Capitalisation Ratio over the total number of shares.

- *Negotiable Market Capitalisation Ratio = Free Float shares / Total number of shares*
- *Adjusted Shares = Total number of shares × Inclusion Factor*

Inclusion factor is determined by the following table:

#### Category-Weight Table

Negotiable Market Cap Ratio (%)	≤ 15	(15, 20]	(20, 30]	(30, 40]	(40, 50]	(50, 60]	(60, 70]	(70, 80]	>80
Inclusion Factor (%)		20	30	40	50	60	70	80	100

#### Example of the Application of the Category-Weight Method

Stock	Stock A	Stock B	Stock C
Total Shares	100,000	8,000	5,000
Non Free Float	88,800	4,500	900
Free Float	11,200	3,500	4,100
= Total Shares - Non Free Float			
Negotiable Market Capitalisation Ratio	11.2%	43.8%	82.0%
= Free Float / Total Shares			
Inclusion Factor	12%	50%	100%

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Inclusion Shares	12,000	4000	5000
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### 3.6 Total Return Index

CES indices are price return indices. Nonetheless, the daily total return index values are calculated for investors' reference. The total return index, which offers investors a different angle to measure index performance, includes the reinvestment return of cash dividends.

The calculation formula of total return index is same as that of the price return index, except that the divisor is adjusted for dividends on the ex-dividend day.

## 4. Index Maintenance

When changes occur to constituent list or the share structure, or constituents' market capitalisation changes due to non-trading factors, the divisor is adjusted to keep the index comparable over time, that is, based on the rules in Section 5: "Maintenance of Constituent Shares and Capping Factor Adjustments", CES indices adopt the "Divisor Adjustment Methodology" to adjust the old divisor.

### 4.1 Formula of Divisor Adjustment Methodology

$$\frac{\text{Adjusted Market Cap before Adjustment}}{\text{Old Divisor}} = \frac{\text{Adjusted Market Cap after Adjustment}}{\text{New Divisor}}$$

*Adjusted Market Capitalisation after Adjustment = Adjusted Market Capitalisation before Adjustment + Adjusted Market Capitalisation increase (or decrease)*

*The new divisor derived from this formula is used for future index calculation.*

## 4.2 Circumstances for Index Maintenance

### 4.2.1 Corporate actions that may affect the price of constituents

- Dividend: No adjustment is made to CES indices for dividend payment. The return from dividend payment is accrued to the total return index on the ex-dividend date as described in 3.6 (Total Return Index).
- Bonus issues, rights issues, stock splits and stock consolidations: The index is adjusted on the day on the ex-right date.

*Market Capitalisation after the Adjustment = Ex-right Price × Adjusted No. of Shares + Market Capitalisation before the Adjustment (excluding shares under adjustment for bonus issues, rights issues, stock splits and stock consolidations)*

### 4.2.2 Share changes caused by other corporate events

- For other corporation events (such as secondary offering, share buyback, exercise of convertible bonds and warrants, etc.) share adjustment will be implemented immediately if accumulated share change adds up to 5% or more.

*Adjusted Market Capitalisation after the Adjustment = closing price × adjusted shares after changes*

- Share adjustment will be deferred to the next regular review if the accumulated share change is less than 5%.

### 4.2.3 Share changes caused by shareholders' actions

- Share changes caused by shareholder actions are adjusted semi-annually. The share change is implemented after the market

close on the second Friday of June and December.

#### 4.2.4 Constituents adjustment

- Index is adjusted before the effective day of regular review or non-regular adjustment.

#### 4.2.5 Capping Factor adjustment

- Index is adjusted before the effective day of regular review or non-regular Capping Factor adjustment.

## **5. Maintenance of Constituent Shares and Capping Factor Adjustments**

### 5.1 Maintenance of Constituent Shares

To ensure that CES indices reflect the trading status of related stocks, constituent shares are maintained based on the following rules:

- Constituents are maintained based on public information published by listed companies or via information vendors.
- Free float shares adjustment resulting from non-corporate actions is reviewed semi-annually. The adjustment will be implemented after the market close on the second Friday of June and December.
- Share adjustment from corporate actions (such as bonus issues, rights issues, stock splits and stock consolidations) will be implemented on the ex-date.
- For other corporation events (such as secondary offering, share buyback, exercise of convertible bonds and warrants, etc.) share adjustment will be implemented immediately if accumulated share

change adds up to 5% or more; Share adjustment will be deferred to next regular review if accumulated share change is less than 5%.

- When a corporate event causes the accumulated share changes to be 5% or more, the share adjustment will be implemented on the effective day of the corporate event as indicated in the published announcement. In the event that the announcement date is later than the effective date of corporate event, the effective date of share adjustment will then be the next trading date after the announcement date.

## 5.2 Capping Factor Adjustments

The Capping Factors are updated semi-annually. The new Capping Factor is implemented after market close on the second Friday of June and December, effective on the next trading day, and is calculated based on the data collected 5 trading days prior to the effective date. If the change in constituent shares or constituent weightings is deemed significant, CESC may conduct a non-regular Capping Factor adjustment.

## 6. Amendments and Supplements to Index Methodology

In response to market development and clients' feedback, CESC and CSIC will amend or supplement the Index Methodology from time to time as appropriate. Proposed changes will be announced to the market prior to implementation.

## 7. Information Disclosure

To maintain the objectiveness, independence and authority of the indices,

CESC has adopted a stringent information disclosure policy to ensure transparency, openness and fairness.

- Any personnel of CESC and CSIC are forbidden to divulge any information to any third party, including private media interviews before such information is disclosed to the public.
- Media used for information disclosure includes but not limited to website of CESC and CSIC.
- In general, the regular index review results are published two weeks before the effective date, while that of CES Stock Connect Index Series is published one week before the effective date. Non-regular adjustment in constituents will be published as soon as practicable. Changes in index methodology and index maintenance rules are usually published two weeks before the effective date.

## **8. Index Dissemination**

### **8.1 Dissemination Channels**

CES indices are disseminated via various channels::

- Broadcasted via HKEX's and CSIC's real time broadcast systems;
- Released real time globally via global information vendors;
- Published daily through the Internet at CESC's website: <http://www.cesc.com/>.
- Published daily through the Internet at CSIC's website: <http://www.csindex.com.cn/>.
- The total return indices are published daily after the close of trading through the Internet at CESC's website: <http://www.cesc.com/> and CSIC's website: <http://www.csindex.com.cn/>

## 8.2 Dissemination Frequencies

Real-time indices are calculated every one second and disseminated every five seconds. End-of-day indices are calculated and disseminated after the close of trading.

## Appendix A: Free Float

Some of the issued shares are almost illiquid within a specific period of time owing to sales restriction or strategic holding and so on. The investment opportunity of the index will not be truly reflected if these non-negotiable shares are included in compilation of the index. Hence, a free float market capitalisation weighted method is used to calculate the index.

### 1. Scope of Free Float

Free float is defined as the issued shares tradable in the open stock market. The restricted shares and any holdings of shares classified under the six categories listed below will be deemed as non-free float shares:

- (1) Long term holdings by founders, their families and senior executives of the company: Shares held by founders or founders' families as well as shares held by board members, supervisors and members of the senior management team etc.
- (2) Government holdings: Shares held by the government or agencies.
- (3) Strategic holdings: Shares held by strategic investors for long-term strategic interests subject to lock-up period.
- (4) Frozen shares: Frozen shares held by investors.
- (5) Restricted employee shares: Shares held by employees including employee pension plan, annuities for employees or management staff subject to lock up period.
- (6) Cross holdings: Two or more listed companies holding shares of other listed company(ies) which results in cross holdings.

## **2. Identification of Free Float**

(1) Restricted shares subject to lock-up period are deemed as non-free float.

(2) For non-restricted shares, the shares are deemed as non-free float if the shareholding held by shareholders classified under the six categories above together with persons acting in concert exceeds 5%. For the avoidance of doubt, any shareholdings, including any of the above six categories of less than 5% is treated as free float.

(3) Restricted shares after the lock-up period are treated the same way as non-restricted shares.

## **3. Information Source**

Free float is determined using all public information that is required to be disclosed by existing laws and regulations, which includes:

- (1) Prospectus and listing notice;
- (2) Financial report; and
- (3) Company announcement.

## **4. Adjustment of Free Float**

Free float changes resulting from shareholder actions are implemented in the semi-annual index regular review. The adjustment will take effect after the market close on the second Friday of June and December.

## Appendix B: Definition

1. A Share – Securities of Chinese incorporated companies that trade on the SSE (Main Board) or SZSE (Main Board, SME Board and ChiNext), quoted in Renminbi (RMB).
2. Northbound Trading under Shanghai Connect – the trading of SSE Securities by Hong Kong and international investors through the Trading Link.
3. Northbound Trading under Shenzhen Connect – the trading of SZSE Securities by Hong Kong and international investors through the Trading Link.
4. Southbound Trading under Stock Connect – the trading of SEHK Securities by Mainland investors through the Trading Links of Shanghai Connect and Shenzhen Connect.
5. ST Stocks – ST Stocks refer to stocks that are specially treated by regulators due to losses suffered for two consecutive years or other reasons.
6. \*ST Stocks – Stocks that are specially treated by regulators and defined as stocks with potential delisting risks.
7. Listing Suspension – Shares of company have been suspended from listing by SSE and SZSE.
8. Review Data Cutoff Date (“Review Cutoff Date”) – the cutoff date for June and December review on 30<sup>th</sup> April or 31<sup>st</sup> October as the case may be.
9. Adjusted price of ex-dividend and ex-right – The reference price published by the exchanges on the ex-right (dividend) day which is used to notify

investors that the intrinsic value of the stocks have been diluted due to dividend or rights offering.

a) Dividend

$$\text{Ex-dividend price} = \text{Closing price before ex-dividend day} - \text{Dividend per share}$$

b) Bonus issue

$$\text{Ex-bonus price} = \frac{\text{Closing price before ex-bonus day}}{1 + \text{Bonus issue ratio}}$$

c) Rights issue

$$\text{Ex-right price} = \frac{\text{Closing price before ex-right day} + \text{Rights issue price} \times \text{Rights issue ratio}}{1 + \text{Rights issue ratio}}$$

d) Stock split and stock consolidation

$$\text{Ex-right price} = \text{Closing price before ex-right} \times \frac{\text{Total number of shares before ex-right day}}{\text{Total number of shares on ex-right day}}$$

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