Methodology
Of Ukrainian Equities Index Calculation

1. Introduction

The Ukrainian Equities Index (hereinafter referred to as Index) is an indicator calculated by the Ukrainian Exchange (hereinafter referred to as the Exchange). The Index is calculated during the trading session every 15 seconds. The first Index value is considered the opening value, and the last calculated Index value is considered the closing value.

The full name of the Index in English is "Ukrainian Equities Index"

The short name of the Index in English is "UX Index".

The Index code in the information system is UX.

2. Procedure for Index calculation

The UX Index (I_n) is computed by dividing the total market capitalization of the Index component securities (MC_n), employed in the Index calculation (hereinafter the Securities List), by the total market capitalization of the same securities as of the initial date (MC_1) multiplied by the Index value as of the initial date (I_1) and the adjusting coefficient (Z_n):

$$I_n = Z_n * I_1 * \frac{MC_n}{MC_1}$$

MC_n - total market capitalization as of current date (in hryvnias):

$$MC_n = \sum_{i=1}^{N} W_i * P_i * Q_i * C_i$$

where W_i – adjusting coefficient reflecting the number of outstanding i-th shares (free-float coefficient);
C_i – the coefficient restricting the share of the i-th share in total market capitalization (weighting coefficient);
Q_i - the total number of i-th shares;
P_i - price of the i-th security in hryvnias as of settlement time n;
N - the number of shares on the Securities List.

3. Initial values:

I_1 = 500 as of March 26, 2009,
MC_1 = 1243418850
Z_1 = 1

4. Calculation of weighting coefficients

The share of the securities value (hereinafter referred to as "Specific weight") for each security from the Securities list in the total value of the given securities is calculated by the formula:

$$Wght_i = \frac{W_i * P_i * Q_i * C_i}{\sum_{i=1}^{N} W_i * P_i * Q_i * C_i}$$

Specific weight of the securities of one issuer is calculated as a sum of specific weights of the securities of all categories of this issuer from the Securities list.

In order to restrict the degree of influence of certain individual securities on Index value, according to the methodology of Index calculation – the specific weight of each constituent of the Index in total market capitalization should not exceed 25% (**S=25%**) as of the day of comprising the Securities list.

Coefficients C_i are used to enforce these rules.

Coefficients (C_i) are updated based on the following procedure. Let us assume that on the n-th day the following coefficients are applied ($C_{n,i}$), while on the day n+1 – new coefficients ($C_{n+1,,i}$) are introduced. New coefficients are calculated based on the results of the n-th trading session using the following iterative procedure:

Step 1. Shares of securities' value are calculated without restricting coefficients $C_{n,i}$:

$$S_i^{(1)} = \frac{MCap_i}{\sum\limits_{i=1}^{N} MCap_i}, \qquad i = 1,...,N$$

$$Mcap_i = \sum\limits_{k} P_{ik} * Q_{ik} * W_{ik},$$

where **k** is a number of types of securities of i-th issuer included into Index.

The number of issuers, for whom $S_i^{(1)} \geq S$, is calculated. Let us call these issuers "pent-up issuers". Let the number of these issuers be $M^{(1)}$.

Step 2. An auxiliary value $X^{(1)}$ is calculated as follows:

$$\frac{X^{(1)}}{M^{(1)} * X^{(1)} + \sum\limits_{i=1}^{N-M^{(1)}} MCap_i} = S,$$

where the sum in the denominator ($\sum\limits_{i=1}^{N-M^{(1)}} MCap_i$) is calculated based on issuers that are not on the list of the "pent up issuers".

$$X^{(1)} = \frac{S * \sum\limits_{i=1}^{N-M^{(1)}} MCap_i}{1 - S * M^{(1)}}$$

Step 3. The shares of securities' values of issuers $S_{n,i}^{(2)}$ are calculated as follows:

$$S_{n,i}^{(2)} = \frac{MCap_i}{\sum\limits_{i=1}^{N} MCap_i}$$

on condition that for each "pent up issuer" $Mcap_{n,i} = X^{(1)}$. The new list of "pent up issuers" will include securities that meet the following criterion: $S_{n,i}^{(2)} \geq S$. If the new list does not match the old

list (the new list is longer than the old one), **Step 2** is repeated with a new list of "pent up issuers". Otherwise, move to **Step 4**. After **k** iterations we will have the final list of "pent up issuers" and the final value $X=X^{(k)}$.

Step 4. For "pent up issuers" the following coefficients are calculated

$$C_{n+1,i} = \frac{X}{P_i * Q_i * W_i},$$

for the rest of issuers $C_{n+1,i} = 1$.

5. Initial data

The following initial data is used to calculate the Index:

1. Information about transactions executed in the trading system based on the indirect orders with constituent securities during a trading session.
2. Information about current best quotes.

6. I-th stock price calculation (Pi)

The security price P_i equals the price of the last trade as of the moment of calculating the UX Index.

If at the moment of UX Index calculation the price of a security goes outside the range of prices between the best bid and the best ask, then the price of a security P_i is determined with the best bid and the best ask taken into account:

–   If the price of the best standard bid exceeds the last calculated price of this security, the price of this security P_i equals the best standard bid price.

–   If the price of the best standard ask is lower than the last calculated price of this security the price of this security P_i equals the best standard ask price.

7. Currency

All prices are in Ukrainian hryvnias.

8. Information Precision

Index values are calculated accurate to 2 decimal places. Prices are calculated with 5 decimal places accuracy, adjusting coefficient Z_n – 7 decimal places, free-float coefficient W_i – 2 decimal places, restricting coefficient C_i – 7 decimal places.

9. Constituent Stocks

The list of securities - Index Constituents is comprised of the most liquid stocks of the Ukrainian companies (no less than 10 issuers) selected, based on expert evaluation.

The stocks are selected based on the following criteria:

- trading volume;
- frequency of concluding trades;
- supply and demand;
- spreads;
- market capitalization with free-float adjustment;

- issuer's industry;
- other factors affecting liquidity.

The Securities list is compiled based on trading statistics for the three previous months.

Those securities are included into the Securities list, which have previously entered the list of candidates waiting to be included (further – Waiting list of securities to be included into the Securities list). For the securities of the issuers, who have had first or second public offering, or were formed as a result of reorganization of the issuers, there can be taken a decision on their being included into the Securities list without preliminary inclusion into the Waiting list of securities to be included into the Securities list.

The securities, which previously entered the list of candidates to be excluded from the Securities list (Waiting List of securities to be excluded), are excluded. For the securities of the issuers who have experienced or are to experience corporate events, there can be taken a decision on their being excluded from the Securities list without preliminary inclusion into the Waiting List of securities to be excluded.

The Exchange publishes the following information regarding the Index Committee resolutions on the corporate web-site:

- the new Securities list;
- the Waiting list of securities to be included into the Securities list;
- the Waiting List of securities to be excluded from the Securities List.

10. Calculating free-float coefficients and determining the number of securities used as Index constituents

Adjusting coefficients **Wi**, which account for the number of i-th free float securities, are calculated with 0.01 (1%) accuracy based on information accessible to public and expert evaluation.

Information on current shareholders is provided by information agencies specialized in economic data disclosure and issuing companies.

Coefficients **Wi** are calculated as follows:

$$W_i = \frac{Q_i - Q_i^h}{Q_i}$$

where Q_i - total number of i-th shares,
Q_i^h - number of i-th shares owned by the government, controlling shareholders, management and other strategic investors, including shares in crossholding.

The decision on the number of shares that are taken into account in calculating the Index is taken by the Index Committee.

11. Calculation of the adjusting coefficient Z_n

In case of change of the Securities list, C_i restricting coefficients or W_i free-float coefficients, also in case any corporate events take place or in cases described in clause 12, on day **n** with intent to prevent dramatic upturn caused by these changes, re-calculation of Z_n adjusting coefficient is done:

$$Z_{n+1} = Z_n * \frac{MC_n}{MC_n^{'}}$$

where $MC_n^{'}$ – capitalization calculated in accordance with the changes to the List.

12. Treatment of corporate events

12.1. Additional securities issuing

After getting the information from the Securities and Stock Market State Commission of Ukraine on registration of new issue placement results or redemption of securities that are included in the Securities list, re-calculation of Z adjusting coefficient is done under clause 11. Period of taking into account aforesaid changes is defined in clause 13 of the present methodology.

In some cases, when an issuer announces additional securities issuing, which in opinion of the Index Committee, can lead to a period of price uncertainty on the market, a decision on temporary exclusion of the shares from the Securities list is taken. In this case adjusting coefficient Z is re-calculated as specified in the article 11, before the beginning of a Trading day when a share is temporarily excluded from the Securities list.

Index Committee takes decision on the terms of including the temporarily excluded shares into the Securities list after receiving the information from the Securities and Stock market Commission on registering results of the new issue placement and formation of new market prices.

12.2. Split, reverse split, redemption of some part of stock issue, dividend reinvestment

When securities are split up their price is decreased prorated to the ratio of the new number of securities to the old number, consequently the value of capitalization calculated as product of current prices by the new number of securities is not changed in the result of this corporate event. So there is no need to recalculate **Z** adjusting coefficient.

Dividend reinvestment (increase of the equity capital through dividends) is perceived by the market as splitting-up, so **Z** coefficient is also not recalculated.

Reverse split and redemption of some part of stock issue can be interpreted as "securities' splitting-up with converse factor" so **Z** coefficient is also not recalculated.

12.3. Reorganization of joint stock company

When a joint stock company is reorganized, the Exchange performs certain actions aimed at including this factor into the Index calculation. Depending on the form of reorganization there can be different actions taken. It is up to the Index Committee to choose a suitable action. The information on the taken decisions is published on Exchange's website.

Model procedure in case of reorganization:

12.3.1. Merger of joint stock companies

In case of merger, reorganized companies are excluded from the Index.

In certain cases a decision can be taken to include the stocks of the new company created by merger into the Index list.

To avoid Index leaping fluctuations as a result of changes to the Index list of securities, a new Z coefficient is calculated under clause 11.

12.3.2. Reorganization of a joint stock company in the form of spin off or split off

In case of spin off or split off capitalization of the company's securities is decreased proportionally to the cost of property that is transferred to the new joint stock company in accordance with separation balance sheet or on the basis of market property valuation

Capitalization is decreased on the basis of the results of the last trading day when shares of a company which has not yet been reorganized, are trading. Depending on the reorganization procedure capitalization is decreased through security's price reduction, security's number cut or free-float coefficient decrease.

If it is impossible to evaluate the property to be transferred the Index Committee can take a decision to fix the price and number of issued securities in the Index as of a day preceding the start of trading in securities of the reorganized company. After the start of trading securities of the reorganized company, the price is marked to the market. The number of issued securities can be updated if necessary.

To avoid Index leaping fluctuations as a result of changes to the price of the company going through reorganization a new Z coefficient is calculated under clause 11.

12.3.3. Reorganization of a joint stock company in the form of affiliation

If a joint stock company the stocks of which are included into the Index list affiliates another joint stock company, the total market capitalization in the Index increases in proportion to the assets of the affiliated company. If the stocks of the affiliated company are circulated on the exchange market the assets of the affiliated company are evaluated on the basis of the current market prices with the conversion rate taken into account. The increase of capitalization is estimated by the results of the last trading day prior to reorganization. Capitalization increases due to the increased number of stocks issued or growth of the free-float coefficient.

If it is impossible to evaluate the property of the affiliated company the Index Committee can take the decision to fix the price and number of issued securities in the Index as of some day preceding the start of trading in securities of the reorganized company. After the start of trading securities price is marked to the market. The number of issued securities can be updated if necessary.

To avoid Index leaping fluctuations as a result of changes to the price of the company going through reorganization a new Z coefficient is calculated under clause 11.

13. Procedure of changing the Securities list

Every 3 months the Index Committee takes a decision on introducing changes to the List of securities used for calculating the Index and coefficients.

C_i coefficients are calculated on the basis of the results of the trading day preceding the day on which information on changes to the Securities list is disclosed.

Scheduled changes to the Securities list come into force on March 15th, June 15th, September 15th, December 15th.

Coefficients W_i can be reconsidered each time there are changes to the Securities list as soon as new information on the structure of the issuer's property comes out and in case of unscheduled withdrawal of securities from the Index.

Securities can be withdrawn from the Securities list unscheduled in case of:

- exclusion of the Index constituent from the list of securities admitted to trading;
- Issuer's corporate events (including in accordance with the provisions of paragraph 12.1)

Securities that were temporarily excluded from the Securities list, can be included into it unscheduled in accordance with the provisions of paragraph 12.1.

Notices on changes to the Securities list are posted on Exchange's web site at least 2 weeks before such changes come into effect.

In case of events that are not described in the present methodology the Exchange decides on the actions and periods for such actions to be taken on the basis of situation analysis, disclosing the corresponding information on the Exchange's website.

14. Procedure of Index calculation control

In order to protect the Index from mistakes recalculation of the previously calculated Index values is allowed in case of:
1) a technical failure during Index calculation,
2) a non-standard situation not related to market fluctuations and not provided for by the present methodology, which, however, had a significant impact on the Index.

In case of a technical failure, the Exchange calculates the Index value again in the shortest time possible starting from the moment of spotting the error. In this case the Exchange publishes the corresponding notification on its website.

15. Information Disclosure

Information on Index and methodology of its calculation is disclosed on the Exchange's website.

16. Control over and Procedure of introducing changes to the calculation methodology

The Index Committee exercises general control over Index calculation and comes up with initiatives on introduction of changes into the methodology of Index calculation. The methodology of Index calculation is subject to approval by the Exchange Committee.