METHODOLOGICAL SHEET

NOMINAL EFFECTIVE EXCHANGE RATE OF THE KORUNA

I. Definition and content

The nominal effective exchange rate (NEER) index shows the appreciation (index above 100) or depreciation (index below 100) of the national currency against a basket of selected currencies for a certain period relative to a base period.

According to the interpretation of the International Monetary Fund (IMF) the NEER may be calculated using various methods. Owing to its symmetry, the most widespread method appears to be the weighted geometric average of nominal exchange rates, taking into consideration the shares of the Czech Republic's largest trading partners in total exports and imports.

The NEER calculation method applied by the European Central Bank (ECB) incorporates the shares in exports and imports of the Czech Republic's largest trading partners and comprises those groups of the goods, which are not so sensitive to political measures and better reflect the level of international competitiveness attained. The countries' shares in exports and imports are derived from the trade turnover in groups 5–8 of the Standard International Trade Classification (SITC).

II. Sources and methodology of ascertainment

On basis of the Czech Statistical Office statistics on the territorial and commodity structure of foreign trade for 2020, thirty-two countries – accounting for approximately 90% of the Czech Republic's foreign trade – were selected. For the calculation the euro area countries are identified as a single currency area (the number of euro area countries corresponds to the actual state). The weights were calculated in two ways:

Variant I – used by the International Monetary Fund – comprises the entire trade turnover of the Czech Republic.

Variant II – used by the European Central Bank – comprises only four commodity groups, namely: chemicals and related products, within (SITC group 5), manufactured goods classified chiefly by material (group 6), machinery and transport equipment (group 7) and miscellaneous manufactured articles (group 8).

In the calculation, the exports and imports of the euro area countries are represented by a single weight and the CZK/EUR exchange rate is used (or CZK/ECU rate up to end-1998).

There are 13 currency areas, and the koruna exchange rates are obtained as average monthly rates from the CNB exchange rate chart. Currencies not given former in the CNB exchange rate chart were obtained from IMF monthly statistics.
Since reference month March 2022, the exchange rate of the Russian rouble (RUB) has obtained from the CNB exchange rate table: "FX rates - FX rates of other currencies" announced on the last working day of the month and valid for the following month.

III. Breakdown

The NEER index is calculated as a monthly and annual average in a time series based on the year 2020 for 13 currency areas.

Weights of monetary areas calculated by share of total trade turnover of the Czech Republic

Variant I. in %

Monetary area	2020
1 eurozone	63,6
2 Poland	8,5
3 China	7,7
4 Hungary	3,4
5 United Kingdom	3,2
6 USA	2,9
7 Russian Federation	2,6
8 Romania	1,7
9 Switzerland	1,6
10 Korea	1,4
11 Sweden	1,4
12 Japan	1,2
13 Denmark	0,8
Total	100,0

Weights of monetary areas calculated by share of total trade turnover of the Czech Republic for SITC groups 5-8

Variant II. in %

Monetary area	2020
1 eurozone	63,8
2 Poland	8,3
3 China	8,0
4 Hungary	3,4
5 United Kingdom	3,3
6 USA	2,9
7 Russian Federation	1,9
8 Romania	1,7
9 Switzerland	1,6
10 Korea	1,5
11 Sweden	1,5
12 Japan	1,3
13 Denmark	0,8
Total	100,0

IV. Method of calculation

Nominal effective exchange rate formula

$$\text{NEER}_t = 100 \times \prod_{i=1}^{n} \left(S_{it}^*\right)^{w_i^*}, \text{ or}$$

$$\text{NEER}_t = 100 \times \left(\left(S_{1t}^*\right)^{w_1^*} \times \ldots \times \left(S_{nt}^*\right)^{w_n^*} \right)$$

$\prod (S_{it}^*)^{w_i^*}$ = product of the shares of the exchange rates of the individual trading partners (exchange rate in the period under review / exchange rate in the base period) raised to the power of their weights in the base period

where

$S_{it}^* = S_{it} / S_{i0}$

$S_{it} = 1/R_{it}$

R_{it} = nominal exchange rate of the CZK per unit of the currency of the i-th trading partner in period t

S_{it} = 1 / nominal exchange rate of the CZK per unit of the currency of the i-th trading partner

S_{it}^* = index calculated as a share of the exchange rate of the currency of the i-th trading partner per 1 CZK in period t / exchange rate of the foreign currency of the i-th trading partner in the base period

$$\sum_{i=1}^{n} w_i^* = 1$$

w_i^* = sum of the standardised weights of the shares of the foreign trade of the individual trading partners equals 1

$$w_i^* = \frac{w_i}{\sum_{i=1}^{n} w_i}$$

w_i = weighted average of the share of the i-th trading partner's exports and imports in the exports and imports of the Czech Republic

$$w_i = w_i^X v_X + w_i^M v_M$$

w_i^X = share of the exports of the i-th trading partner in the total exports of the Czech Republic

v_X = share of the exports of the Czech Republic in the total turnover of the Czech Republic

w_i^M = share of the imports of the i-th trading partner in the total imports of the Czech Republic

v_M = share of the imports of the Czech Republic in the total turnover of the Czech Republic

Procedure applied to calculate the nominal effective exchange rate of the koruna:

Variant I

The weights of the 13 currency areas were calculated as a weighted arithmetic average using the absolute values of the exports and imports of the 32 trading partners and the total trade turnover of the Czech Republic in 2020. The sum of these weights accounts for almost 90 % of the total trade turnover of the Czech Republic.

Variant II

The weights of the 13 currency areas were calculated as a weighted arithmetic average using the absolute values of the exports and imports in SITC groups 5–8 of the 32 trading partners and the trade turnover in SITC groups 5–8 of the Czech Republic in 2020. The sum of these shares accounts for almost 90 % of the trade turnover of the Czech Republic in SITC groups 5–8.

The weights of the 13 selected currency areas were standardised so that the sum of all shares equals 1.

The average nominal exchange rates of the koruna per unit of the currency of the selected currency areas (R_{it}) were calculated for months and whole years from 1993 to date.

The inverse nominal value of the exchange rate (S_{it}) per 1 CZK was obtained as a quotient from the relation $1/R_{it}$.

In order to obtain S_{it}^*, S_i in the period under review was divided by S_i in the base period.

S_{it}^* was raised to the power of the relevant standardised weight of the country in 2020, w_i^*. The calculated data for the selected currency areas in the given month (year) were multiplied by one another, the result being one product for each month (year). To obtain the NEER index, the products for the individual months (years) were multiplied by 100. Values below 100 signify depreciation of the exchange rate of the koruna in the period under review relative to the base period, and values above 100 signify appreciation.

The figures are calculated by the CNB's Macroeconomic Statistics Division on the basis of the aforementioned methodological variants, using the CNB exchange rate list, monthly IMF statistics and Czech Statistical Office data on the territorial and commodity structure of foreign trade in 2020.

V. Changes in methodology and content

The IMF methodology recommends changing the weight structure every five years to take account of changes in the territorial structure of the country's trade turnover. The weights will be changed in 2025 using the definitive data on foreign trade for 2027.

VI. Reporting entities

None.