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| **APPROVED**by the Executive Board Moscow Exchange 21 November 2022 (Minutes No. 86))Chairman of the Executive Board \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Yury Denisov |  |

# Reference Exchange Rate Methodology

1. **General provisions**
	1. The present Methodology for calculation of the reference foreign exchange rates (the "Methodology") establishes a procedure for calculation of the reference foreign exchange rate (the "Reference Exchange Rate") by Public Joint Stock Company Moscow Exchange MICEX-RTS (the "Moscow Exchange") used for calculation of the Moscow Exchange Derivatives and Equity indices and (or) other indicators as needed for conducting on-exchange trading and making operations on the Exchange’s markets.
	2. The Reference Exchange Rate is calculated by the Exchange based on information on FX trading data of the Exchange (the "MOEX Exchange Rate"), and/or information on the exchange rate of a foreign currency of one country expressed in the monetary unit of another country, announced by the central bank of the quoted country and released on the official website of the respective central bank (the "Central Bank Rate of the quoted country"), and/or information on the Bank of Russia exchange rates of a foreign currency against the Russian rouble (the "Bank of Russia Exchange Rate"), and/or information on the ratio of the two Reference Rates (the "Cross Rate").
	3. The list of Reference Rates calculated by the Exchange, as well as their calculation parameters and data sources are specified in Appendix 1 to this Methodology.
	4. This Methodology, as well as all amendments and additions thereto, shall be approved by the Exchange and shall come into effect on a date determined by the Exchange.
	5. Following endorsement by the Exchange, this Methodology is made available on the Exchange website at least one business day before coming into force, unless the Exchange decides otherwise.
2. **Calculation of MOEX Exchange Rate**
	1. The MOEX Exchange Rate is calculated on the basis of FX trades in the relevant Instrument executed on the Exchange.
	2. The MOEX Exchange Rate is calculated every second during the trading hours in the main mode on each day the Moscow Exchange FX Market is open.
	3. The MOEX Exchange Rate is calculated according to the following formula:

$$R\_{t}^{moex}=MA\_{t}$$

where:

$R\_{t}^{moex}$ – the MOEX Exchange Rate at time t;

MAt – moving average at time t, determined in accordance with the paragraph 2.4 of this Methodology.

* 1. The moving average at time t is calculated using the following formula:



where:

MAt – moving average at time t;

Ri – the trade price after elimination of non-market deviations, at time i determined in accordance with paragraph 2.5 of this Methodology;

M - averaging period expressed in seconds, determined according to Appendix 1 to this Methodology.

* 1. The trade price after discarding non-market deviations at time t is determined by the following formula:



where:

Rt - the trade price after discarding non-market deviations at time t;

Rt-1 - the trade price after discarding non-market deviations at time t-1;

RAt - the price of the last trade in the corresponding Instrument at time t (without regard to negotiated trades);

K - max deviation value determined in accordance with Appendix 1 to this Methodology;

S - deviation calculation period, expressed in seconds, determined in accordance with Appendix 1 to this Methodology.

1. **Central Bank Rate of the quoted country**
	1. The exchange rate of the central bank of the state of the quoted currency is determined by the central bank of the state of the quoted currency on the basis of trading data in connection with the respective currency. This rate is published on the official website of the given central bank.
2. **Bank of Russia Exchange Rate**
	1. The exchange rate of the Bank of Russia is determined as the latest exchange rate of the foreign currency against the Russian rouble as published on the official website of the Central Bank of the Russian Federation on the Internet (<https://cbr.ru/currency_base/daily/>). The exchange monitors the page at most once an hour, as a rule.
3. **Calculation of Cross Rates**
	1. The calculation of the Cross Rates shown in Table 2 of Appendix 1 shall be carried out according to the formula for calculating the Cross Rate using the Reference Rates shown in Table 1 of Appendix 1:

$$R\_{t}^{cur1cur3}=\frac{R\_{t}^{cur1cur2}}{R\_{t}^{cur3cur2}}$$

where:

Rtcur1cur3 – the Reference Exchange Rate of currency 1 to currency 3 at time t.

Rtcur1cur2 – the Reference Exchange Rate of currency 1 to currency 2 at time t;

Rtcur3cur2 – the Reference Exchange Rate of currency 3 to currency 2 at time t.

1. **Supplementary**
	1. If the currency pair used to calculate the Reference Rate is not traded on the Exchange, one of the following values is set as the Reference Rate:

a) the value of the Bank of Russia Exchange Rate;

b) the value of the Cross Rate calculated using the Bank of Russia Exchange Rate for the currency pair not traded;

c) the value of the Central Bank exchange rate for the state of the quoted currency on the day the Reference Rate is determined;

d) the value of the exchange rate as quoted on Russian or international stock exchanges, if the Exchange so decides.

1. **Publication of Reference Rate values**
	1. The Exchange may disclose the calculated values of the Reference Rates for information purposes on its website.

Appendix 1 to the Reference Exchange Rate Methodology

# List of Reference Exchange Rates and Calculation Parameters

**Table 1**

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| --- | --- | --- | --- | --- | --- | --- |
| **Code** | **Reference Exchange Rate** | **Rates used for Reference Exchange Rate calculation** | **Instrument** | **Extreme deviate K** | **Averaging period M** | **Deviation calculation period S** |
| USD/RUB | Reference US Dollar to Russian Rouble exchange rate | MOEX Exchange Rate | USDRUB\_TOM | 0.0005 | 60 | 60 |
| EUR/RUB | Reference Euro to Russian Rouble exchange rate | MOEX Exchange Rate | EURRUB\_TOM | 0.0005 | 60 | 60 |
| CNY/RUB | Reference Chinese Yuan to Russian Rouble exchange rate | MOEX Exchange Rate | CNYRUB\_TOM | 0.0005 | 60 | 60 |
| CHF/ RUB | Reference Swiss Franc to Russian Rouble exchange rate | Bank of Russia Exchange Rate | CHF | - | - | - |
| JPY/ RUB | Reference Japanese Yen to Russian Rouble exchange rate | Bank of Russia rate divided by 100 | JPY / 100 | - | - | - |
| TRY/ RUB | Reference Turkish Lira to Russian Rouble exchange rate | Bank of Russia rate divided by 10 | TRY / 10 | - | - | - |
| GBP/ RUB | Reference Pound Sterling to Russian Rouble exchange rate | Bank of Russia Exchange Rate | GBP | - | - | - |
| HKD/RUB | Reference Hong Kong Dollar to Russian Rouble exchange rate | Bank of Russia rate divided by 10 | HKD / 10 | - | - | - |
| CAD/RUB | Reference Canadian Dollar to Russian Rouble exchange rate | Bank of Russia Exchange Rate | CAD  | - | - | - |

**Table 2**

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| --- | --- | --- | --- |
| **Code** | **Cross Rate** | Rtcur1cur2 | Rtcur3cur2 |
| USD/JPY | Reference US Dollar to Japanese Yen exchange rate | USD/RUB | JPY/ RUB |
| USD/CHF | Reference US Dollar to Swiss Franc exchange rate | USD/RUB | CHF/ RUB |
| USD/TRY | Reference US Dollar to Turkish Lira exchange rate | USD/RUB | TRY/ RUB |
| EUR/USD | Reference Euro to US Dollar exchange rate | EUR/RUB | USD/RUB |