

## Calculation method of Margin ratio by The Financial Futures Association of Japan

I. Generation of price data	<p>(1) Price data used for margin ratio will be provided by CME Group Benchmark Administration Ltd. (CBA) and generation of FX Market Reference Rate will be conducted as following steps:</p> <p>① For the calculation of major currency pairs, trading data traded during 180 seconds before and after JST 15:00 will collected from the FX Market Platform and the Volume Weighted Average Price (VWAP) will be calculated.</p> <p>② For those currency pairs which VWAP is unavailable, CBA will generate price data by pre-agreed alternative method.</p> <p>In case of emergency such that FX Market Reference Rate is unattainable, price data will be generated in compliance with FFAJ's Emergency measures and Business Contingency Plan.</p>
II. Calculation of figure for the last 26 weeks	<p>(2) Calculate a natural logarithm by result for <math>[\text{daily VWAP}] \div [\text{Previous business day's VWAP}]</math> for the last 26 weeks from the base date (Friday).</p> <p>(3) Seek the standard deviation of above and multiply 2.33 in order to cover 99% of one-sided range.</p>
III. Calculation of figure for the last 130 weeks	<p>(4) Calculate a natural logarithm by result for <math>[\text{daily VWAP}] \div [\text{Previous business day's VWAP}]</math> for the last 130 weeks from the base date (Friday).</p> <p>(5) Seek the standard deviation of above and multiply 2.33 in order to cover 99% of one-sided range.</p>
IV. Determination of applied margin ratio	<p>(6) Compare the figures of above (3) and (5) and the bigger figures will be determined as margin ratio.</p>
V. Distribution of margin ratio	<p>(7) Distribute the margin ratio determined above (6) and leverage ratio to the public.</p> <p><i>Margin ratio: Multiple 100 to above (6) and round up to the second decimal place.</i></p> <p><i>Leverage ratio: Multiple 100 to the above (6)'s reciprocal figure and round down to the second decimal place.</i></p>

<EXAMPLE>

Base data: Friday, 2017/02/17

Currency Pair: USDJPY

(1) Preparation for necessary price data of USDJPY.

< Calculation of figure for the last 26 weeks>

(2)  $113.39$  (VWAP dated 02/17)  $\div$   $113.86$  (VWAP dated 02/16) =  $0.995872124$  ---- ①

Natural logarithm of above ① :  $\text{LN}(0.995872124) = -0.00413642$  --- ②

Seek the result of Natural logarithm by the formula of [VWAP of the day  $\div$  VMAP of previous day] for the last 26 weeks (2016/08/22 – 2017/02/17) ---- ③

(3) Seek the standard deviation of above ③.  $0.00812682$  --- ④

④  $\times 2.33 = 0.018923519$  --- ⑤

< Calculation of figure for the last 130 weeks>

(4) Seek the result of Natural logarithm by the formula of [VWAP of the day  $\div$  VMAP of previous day] for the last 130 weeks (2014/08/25 – 2017/02/17) ---- ⑥

(5) Seek the standard deviation of above ⑥.  $0.006574288$  --- ⑦

⑦  $\times 2.33 = 0.015318091$  --- ⑧

(6) Compare above ⑤ and ⑧, and the bigger figures will be determined as margin ratio ( which is the lower leverage rate)

In this case,  $0.018923519$  --- ⑤

(7) Above (6)  $\times 100 = 1.8923519$  and then round up to the second dismals.

The distributed figure to the public is **1.90%**.

As for Leverage ratio, above (6)'s reciprocal figure  $\times 100 = 52.9100529$  and then round down to the second dismals.

The leverage ratio is **52.63%**.

Above calculation will be applied to each currency pair.