

According to ISDA 2020 IBOR Fallbacks Protocol and Supplement number 70 to the 2006 ISDA Definitions, the fallback rates after THBFIX cessation are consecutively provided in the waterfall approach as follows:

1. Fallback Rate (THBFIX)
2. BOT Recommended Rate
3. THOR with adjustment for term structure (no other spread adjustments)

This Rule Book explains the calculation methodology and publication details of these fallback rates which are in line with Supplement number 70 to the 2006 ISDA Definitions and the 2021 ISDA Interest Rate Derivatives Definitions to include new IBOR fallbacks (collectively, the “ISDA Definitions”).

#### Fallback Rate (THBFIX)

<b>Description</b>	<p>The synthetic rate for deposits in Thai baht (THB), which represents the effective cost of borrowing the THB synthetically by borrowing U.S. Dollar (USD) for the same maturity and swapping out the USD in return for the THB.</p> <p>Fallback Rates (THBFIX) are published in arrears and available for 1-, 3-, and 6-month tenors. Each Fallback Rate (THBFIX) will be labelled with the Original THBFIX Rate Record Day which is two Bangkok business days prior to the start date of the corresponding period.</p> <p>On any publication day, there may be one or more Fallback Rates (THBFIX) associated with a particular tenor displayed on the screen. In addition, a Fallback Rate (THBFIX) for a particular tenor and Original THBFIX Rate Record Day could be re-displayed on the following publication days, but not be re-calculated.</p>
<b>Rate Setting</b>	<p>Refinitiv as the calculation agent shall calculate and determine the Rate, for each maturity matching each Tenor and Original THBFIX Rate Record Day specified below (each a “calculation period”) on each Business Day as follows:</p> <p>Fallback Rate (THBFIX) =</p>

$$\left\{ \left[ \left( \frac{\text{Spot Rate} + \text{Forward Points}}{\text{Spot Rate}} \right) \times \left( 1 + \frac{\text{USD Rate} \times \#days}{360} \right) \right] - 1 \right\} \times \frac{365}{\#days} \times 100$$

Where:

“**USD Rate**” means the latest available compounded in arrears of SOFR plus fixed spread adjustment (the all-in rate is called Fallback Rate (SOFR) in the ISDA Definitions) for the corresponding Tenors and Original THBFX Rate Record Day of the calculation period which is calculated and published by Bloomberg on <FBAK> <GO> page.

Note:

- To publish Fallback Rates (THBFX) in the morning of the publication day, Fallback Rates (SOFR) published on the previous day will be used in the calculation.
- On any Fallback Rate (THBFX) publication day, if there is no Fallback Rate (SOFR) for the corresponding tenor published on the previous day, the latest available Fallback Rate (SOFR) with the most recent Original IBOR Rate Record Day will be used.
- On any Fallback Rate (THBFX) publication day, if there are multiple Fallback Rates (SOFR) of the same tenor published on the previous day, Fallback Rate (SOFR) with the most recent Original IBOR Rate Record Day will be used.

“**#days**” means the actual number of days in the calculation period.

“**Spot Rate**” means, in relation to all USDTHB Spot Qualified Transactions traded on the Original THBFX Rate Record Day (excluding transactions with unusually high volumes or unusual spot rates), the volume weighted average rate calculated as follows:

$$\text{Spot Rate} = \frac{\sum (\text{THB Principal}_i \times \text{Spot Rate}_i)}{\text{THB Aggregate Principal}}$$

Where:

“**THB Principal<sub>i</sub>**” means, in relation to a Qualified Transaction, the notional amount, in USD, of that Qualifying Transaction.

“**THB Aggregate Principal**” means, the aggregate notional amounts of all USDTHB Spot Qualifying Transactions, in USD.

	<p><b>“Spot Rate<sub>i</sub>”</b> means, in relation to a Qualifying Transaction, the USDTHB spot rate traded on the Original THBFX Rate Record Day.</p> <p><b>“Forward Points”</b> means, in relation to all Qualified Transactions traded on the Original THBFX Rate Record Day (excluding transactions with unusually high volumes or unusual forward points), the volume weighted average rate calculated as follows:</p> $\text{Forward Points} = \frac{\sum(\text{THB Principal}_i \times \text{Forward Point}_i)}{\text{THB Aggregate Principal}}$ <p>Where:</p> <p><b>“THB Principal<sub>i</sub>”</b> means, in relation to a Qualified Transaction, the notional amount in USD of that Qualified Transaction in each respective tenors of a business day.</p> <p><b>“THB Aggregate Principal”</b> means, the aggregate notional amounts of all Qualified Transactions in USD in each respective tenors of a business day.</p> <p><b>“Forward Points<sub>i</sub>”</b> means, in relation to a Qualifying Transaction traded on the Original THBFX Rate Record Day, the difference between the currency exchange rate of the near leg (spot rate) and the currency exchange rate of far leg (forward rate) of that Qualifying Transaction for each specific tenors.</p>
<b>Qualified Transactions</b>	<p>Any type of trade which satisfies all of the following conditions:</p> <p>(a) having a notional amount equal to or exceeding the Minimum Notional</p> <p>(b) USDTHB FX Swaps: Both counterparties are Contributing Banks</p> <p>(b) USDTHB FX Spot: Both counterparties are Contributing Banks or at least one counterparty is a Contributing Bank where the transactions are electronically routed and captured through a FX Broker</p> <p>(c) confirm traded during the Qualifying Window; and</p> <p>(d) maturities matching the Tenors specified below</p>
<b>Types of Trades</b>	USDTHB Spot and USDTHB FX Swaps (with maturities matching the Tenors specified below)
<b>Notional</b>	<p>USDTHB Spot: Minimum at USD 1,000,000 and Maximum at USD 100,000,000</p> <p>USDTHB FX Swaps: Minimum at USD 1,000,000 and Maximum at USD 500,000,000</p>
<b>USDTHB FX Swaps</b>	<p>Tenor: 1 month, 3 months, 6 months</p> <p>Business Day: Bangkok and New York</p>
<b>Day Count</b>	<p>THB – Actual/365</p> <p>USD – Actual/360</p>

<b>No. of Decimal Places</b>	Fallback Rate (THBFX): 5 decimal places, round to the nearest USDTHB Spot: 4 decimal places, round to the nearest USDTHB FX Swaps: 4 decimal places, round to the nearest
<b>Qualifying Window</b>	USDTHB Spot: 2:30 p.m. to 3:00 p.m., Bangkok time USDTHB FX Swaps: 7:30 a.m. to 4:30 p.m., Bangkok time
<b>Submission Window</b>	All trade transactions will be submitted between USDTHB Spot: 2:30 p.m. to 3:25 p.m., Bangkok time USDTHB FX Swaps: 7:30 a.m. to 4:55 p.m., Bangkok time
<b>Publication Time</b>	<u>Refinitiv Screen</u> USDTHB Spot Rate: 3:30 pm, Bangkok Time on the Original THBFX Rate Record Day USDTHB Forward Points: 5:00 pm, Bangkok Time on the Original THBFX Rate Record Day Fallback Rate (THBFX): 8.00 a.m., Bangkok Time on Bangkok business day <u>BOT Website</u> Fallback Rate (THBFX): 9:00 a.m., Bangkok Time on Bangkok business day On Fallback Rate (THBFX) publication screen, the Spot Rate, Forward Points, and Original IBOR Rate Record Day used for the calculation are provided.
<b>Publication Page</b>	Refinitiv Screen <FBKTHBFX> BOT Website ( <a href="https://app.bot.or.th/Fallbackthbfix/en">https://app.bot.or.th/Fallbackthbfix/en</a> )
<b>Correction to Rate</b>	Any correction to USDTHB spot and USDTHB FX swaps must be revised within 60 minutes from publication time on the trade date (Original THBFX Rate Record Day). Any correction to Fallback Rate (THBFX) must be revised within 30 minutes from publication time.
<b>Fallback Policy</b>	<b>Fallback Policy for USDTHB Spot Rate and Forward Points publication</b> <b>Fallback Trigger:</b> In respect of any maturity, a Fallback Trigger occurs if there is no Qualified Transactions traded during the Qualifying Window on the Original THBFX Rate Record Day. <b>Fallback Policy:</b> <ul style="list-style-type: none"> <li>• USDTHB Spot Rate</li> </ul>

**Trigger:**

A Fallback Trigger occurs if there is no USDTHB FX Spot Qualified Transaction traded during the Qualifying Window on the Original THBFX Rate Record Day.

**Procedures:**

1. The Qualifying window shall be extended by 25 minutes (from 2:30 p.m. – 3:00 p.m. to 2:30 p.m. – 3:25 p.m. BKK time) to accept additional Qualified Transactions that are traded on the FX Broker Electronic Matching Platform (Matching). If any Matching Qualified Transactions are available by 3:25 p.m., the USDTHB spot rate will be published at 3:30 p.m. on the Original THBFX Rate Record Day.
2. If there are no Qualified Transaction from Matching after extending Qualifying Window according to Procedure 1, Fallback Rate (THBFX) calculation will utilize the weighted-average Interbank Exchange Rate of the relevant Original THBFX Rate Record Day published by Bank of Thailand.

<https://www.bot.or.th/en/statistics/exchange-rate.html>

- **USDTHB Forward Points**

**Trigger:**

A Fallback Trigger occurs for each tenor if there is no USDTHB FX Swap Qualified Transaction for any tenor traded during the Qualifying Window on the Original THBFX Rate Record Day.

**Procedures:**

USDTHB Forward Points of the most recent Bangkok business day prior to the Original THBFX Rate Record Day that have Qualified Transactions and adjusted by day counts of the USDTHB FX Swaps on the Original THBFX Rate Record Day by using the following formula:

$$\text{Adjusted forward points} = \frac{\text{Forward Points}}{\text{Day count of the Forward Points}} \times \text{Day count of the Original THBFX Rate Record day}$$

## THOR

<b>Description</b>	The interbank overnight private repurchase rate, determined from the volume-weighted average of the Qualified Transactions in the overnight private repurchase market.
<b>Qualified Transactions</b>	Any type of trade which satisfies all the following conditions: (a) Overnight repurchase transactions which has been traded and settled on the same day within the Qualifying Window. (b) Both counterparties are commercial banks or specialized financial institutions (SFIs); and (c) A notional amount of transaction equals to or exceeds 100 million baht.
<b>No. of Decimal Places</b>	5 decimal places, round to the nearest
<b>Qualifying Window</b>	7:00 a.m. to 4:00 p.m., Bangkok time
<b>Submission Window</b>	7:00 a.m. to 4.30 p.m., Bangkok time
<b>Publication Time</b>	Every Bangkok business day at 5:00 pm, Bangkok Time
<b>Publication Page</b>	BOT Website ( <a href="https://app.bot.or.th/THOR/en">https://app.bot.or.th/THOR/en</a> )
<b>Revision Policy</b>	Adjustment is according to actual data at 9.30 am on the following business day should the change result in at least a 1 basis point change in THOR
<b>Fallback Policy</b>	In the event that there is no Qualified Transaction for that particular business day, THOR will be THOR as published in respect of the first preceding business day adjusted with the difference of Bangkok Interbank Offered Rate (BIBOR) on the day and the preceding business day. This can be represented by the following equation: $THOR_T = THOR_{T-1} + (Policy\ Rate_T - Policy\ Rate_{T-1})$

According to Supplement number 70 to the 2006 ISDA Definitions and the 2021 ISDA Interest Rate Derivatives Definitions, if BOT Recommended Rate is not available, the Calculation Agent of each contract will calculate the contract's reference rate from THOR and make such adjustments as are necessary to account for any difference in term structure or tenor of THOR by comparison to Fallback Rate (THBFIX). In this regard, the recommended calculation methodology and convention for applying THOR are as follows.

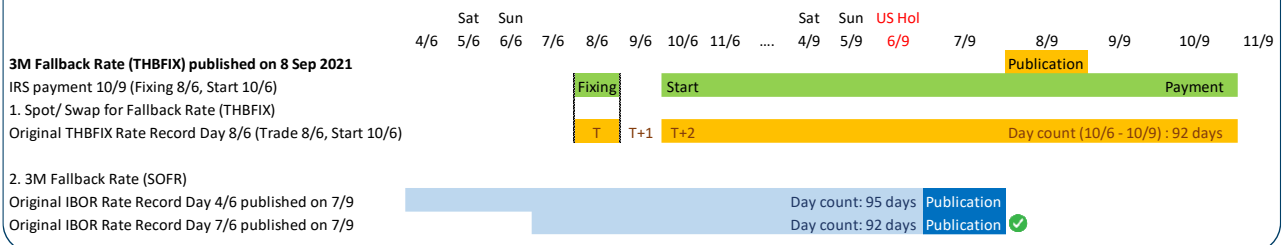
<b>Backward-looking</b>	To account for the term structure, compound average of daily THOR using the following formula is recommended:
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<b>term rate calculation</b>	<p style="text-align: center;">Compounded overnight rate<sub>t</sub> = <math>\left[ \prod_{i=1}^{d_0} \left( 1 + \frac{\text{overnight rate}_i \times n_i}{365} \right) - 1 \right] \times \frac{365}{d}</math></p> <p>Where <math>n_i</math> equals the number of calendar days in the relevant Calculation Period for which the rate is overnight rate<sub>i</sub> (in the case that <math>i</math> falls on a Friday, overnight rate<sub>i</sub> would be the rate for Friday, Saturday and Sunday. Thus, <math>n_i</math> equals 3).</p>
<b>Interest observation period</b>	<p>To replicate the economic value of contracts referencing Fallback Rate (THBFIX) as much as possible, the lookback with observation shift by 2 business days (2-day backward shift) is recommended.</p>

## Annex A: Illustration of Fallback Rate (THBFIX) publication with respect to conventional THBFIX Interest Rate Swap period payment dates

### Annex A1: The publication of single Fallback Rate (THBFIX) per tenor

Figure 1: Single rate publication



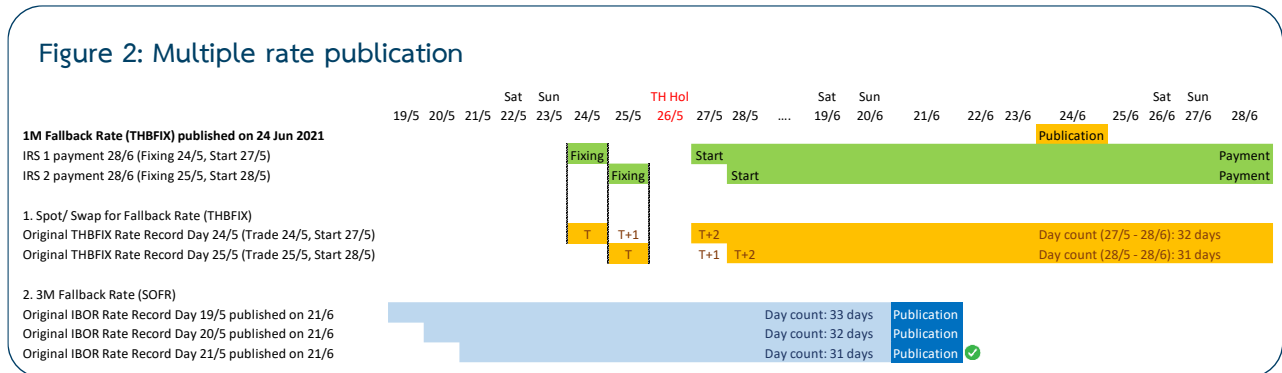
In order to calculate the 3-month Fallback Rate (THBFIX) published on 8 September 2021, all 3-month IRS periods with the end date (payment date) on two Bangkok business days after the publication date, i.e. 10 September 2021, must be identified. In this case, there is only one 3-month IRS period with the end date on 10 September 2021. This IRS period start date is 10 June 2021 and the original fixing day (or ‘the Original THBFIX Rate Record Day’) is 8 June 2021. This example is shown in Figure 1. The required inputs are USDTHB Spot Rate, USDTHB Forward Points, and Fallback Rate (SOFR). Input details are as follows.

1. The USDTHB Spot Rate and 3-month USDTHB Forward Points from the Original THBFIX Rate Record Day, 8 June 2021, which are the same FX data points used in the 8 June 2021 3-month THBFIX calculation. Note that the underlying USDTHB FX swaps is traded on 8 June 2021 with the value date on 10 June 2021 and the maturity date on 10 September 2021.
2. The latest available 3-month Fallback Rate (SOFR) from Bloomberg’s publication, i.e. Fallback Rate (SOFR) published on 7 September 2021. In this case, there are two 3-month Fallback Rates (SOFR) with the Original IBOR Rate Record Day on 4 June 2021 and 7 June 2021. The most recent Original IBOR Rate Record Day will then be applied, i.e. 7 June 2021.



## Annex A2: The publication of multiple Fallback Rates (THBFIX) per tenor

Figure 2: Multiple rate publication



In order to calculate the 1-month Fallback Rate (THBFIX) published on 24 June 2021, all 1-month IRS periods with the end date (payment date) on two Bangkok business days after the publication date, i.e. 28 June 2021, must be identified. In this case, there are two 1-month IRS periods with the end date on 28 June 2021 which are IRS 1 and IRS 2. (IRS 1 end date is shifted from 27 June 2021, which is Sunday, to the next Bangkok business day.)

- IRS 1 start date is 27 May 2021, and the original fixing day is 24 May 2021. IRS 1 is labelled with the Original THBFIX Rate Record Day 24 May 2021.
- IRS 2 start date is 28 May 2021, and the original fixing day is 25 May 2021. IRS 2 is labelled with the Original THBFIX Rate Record Day 25 May 2021.

This example is shown in Figure 2. The required inputs are USDTHB Spot Rate, USDTHB Forward Points, and Fallback Rate (SOFR). Input details are as follows.

### 1-month Fallback Rate (THBFIX) with the Original THBFIX Rate Record Day 24 May 2021.

1. The USDTHB Spot Rate and 1-month USDTHB Forward Points from the Original THBFIX Rate Record Day, 24 May 2021, which are the same FX data points used in the 1-month 24 May 2021 THBFIX calculation. Note that the underlying USDTHB FX swaps is traded on 24 May 2021 with the value date on 27 May 2021 (The value date is shifted from 26 May 2021, which is not a Bangkok business day) and the maturity date on 28 June 2021 (The maturity date is shifted from 27 June 2021).
2. The latest available 1-month Fallback Rate (SOFR) from Bloomberg's publication, i.e. Fallback Rate (SOFR) published on 21 June 2021 and the most recent Original IBOR Rate Record Day is 21 May 2021. Note that there is no Fallback Rates (SOFR) with the Original IBOR Rate Record Day 22 and 23 May 2021 published on 22 and 23 June 2021, as the Original IBOR Rate Record Day cannot fall on Saturday and Sunday.

1-month Fallback Rate (THBFIX) with the Original THBFIX Rate Record Day 25 May 2021.

1. The USDTHB Spot Rate and 1-month USDTHB Forward Points from the Original THBFIX Rate Record Day, 25 May 2021, which is the same FX data point used in the 25 May 2021 1-month THBFIX calculation. Note that the underlying USDTHB FX swaps is traded on 25 May 2021 with the value date on 28 May 2021 and the maturity date on 28 June 2021.
2. The latest available 1-month Fallback Rate (SOFR) with the most recent Original IBOR Rate Record Day, i.e. 1-month Fallback Rate (SOFR) published on 21 June 2021 with the Original IBOR Rate Record Day 21 May 2021, which is also used in the calculation of 1-month Fallback Rate (THBFIX) with the Original THBFIX Rate Record Day 24 May 2021.

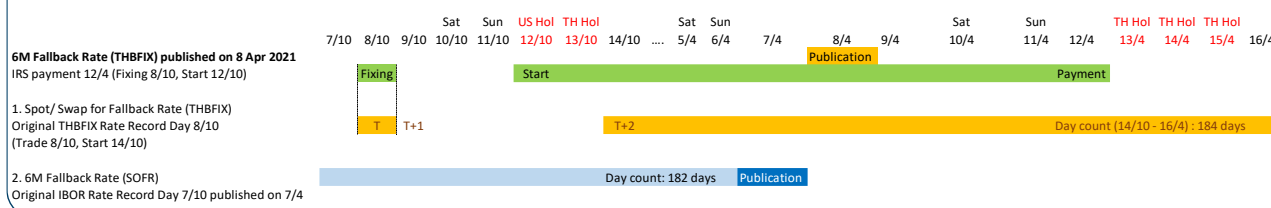
There could be multiple Fallback Rates (THBFIX) of the same tenor published on the same day with different Original THBFIX Rate Record Days. According to ISDA 2020 IBOR Fallbacks Protocol and Supplement number 70 to the 2006 ISDA Definitions, the usage of fallback rate is to observe the rate two business days prior to the payment date. The aforementioned calculation approach is designed for each Original THBFIX Rate Record Day matching with the original fixing date of the corresponding IRS period.

In Figure 2, on the 24 June 2021 publication day, there are two 1-month Fallback Rates (THBFIX) with the Original THBFIX Rate Record Day 24 May 2021 and 25 May 2021. IRS 1 with the period starting on 27 May 2021 and ending on 28 June 2021 would observe the 1-month Fallback Rate (THBFIX) with the Original THBFIX Rate Record Day 24 May 2021. IRS 2 with the period starting on 28 May 2021 and ending on 28 June 2021 would observe the 1-month Fallback Rate (THBFIX) with the Original THBFIX Rate Record Day 25 May 2021.

## Annex B: Illustration of Fallback Rate (THBFIX) calculation

Calculation steps for the 6-month Fallback Rate (THBFIX) with the Original THBFIX Rate Record Day 8 October 2020, published on 8 April 2021. The corresponding IRS period starts on 12 October 2020 and ends on 12 April 2021.

**Figure 3: Calculation of Fallback Rate (THBFIX)**



1. Calculate the volume weighted average USDTHB Spot Rate and 6-month USDTHB Forward Points from the Qualified Transactions traded on the Original THBFIX Rate Record Day, which is 8 October 2020.
2. Retrieve the latest available 6-month Fallback Rate (SOFR) with the most recent Original IBOR Rate Record Day published by Bloomberg.
3. Calculate Fallback Rate (THBFIX) from the following formula:

$$\text{Fallback Rate (THBFIX)} = \left\{ \left[ \left( \frac{\text{Spot Rate} + \text{Forward Points}}{\text{Spot Rate}} \right) \times \left( 1 + \frac{\text{USD Rate} \times \#days}{360} \right) \right] - 1 \right\} \times \frac{365}{\#days} \times 100$$

- USDTHB Spot Rate on 8 October 2020 = 31.1715
- 6-month USDTHB Forward Points on 8 October 2020 = 1.1059 ÷ 100 = 0.011059
- #days = 184

(Note that the value date and the maturity date of USDTHB FX swaps must be both New York and Bangkok business day. In this example, day count of USDTHB FX swaps is 184 days, starting on 14 October 2020 and ending on 16 April 2021.)

- Fallback Rate (SOFR) published on 7 April 2020 with the Original IBOR Rate Record day 7 October 2020 = 0.47086%

On the publication day 8 April 2021, 6-month Fallback Rate (THBFIX) with the Original THBFIX Rate Record Day 8 October 2020 equals to 0.54795% per annum.