CME Group

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F-TIIE OIS Conversion Curve Construction

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1. **Introduction**

In order to facilitate the transition from 28D TIIE interest rate swaps (IRS) to TIIE de Fondeo (F-TIIE) overnight index swaps (OIS) for the MXN market, **CME Group intends to convert certain legacy 28D TIIE swaps to F-TIIE OIS on November 22nd, 2024,** with additional information available [here](#).

CME will leverage the binding economic relationship that has been established by the Bank of Mexico's modification formula to underpin the conversion pricing methodology for 28D TIIE and the F-TIIE curve for any fixings scheduled to occur on or after December 3, 2025, defined by CME Group as the "Index Waiver Expiration Date (IWED)."

On the day of the primary conversion (Nov 22nd, 2024), CME's end of day F-TIIE valuation curve will be used to price cash flows of the original 28D TIIE IRS that fix on or after the Index Waiver Expiration Date (using conversion pricing). The F-TIIE curve will also be used to price the forward starting F-TIIE replacement OIS in addition to any outstanding F-TIIE OIS positions in production. Further information on conversion pricing can be found [here](#).

Note, CME will continue to use curves built using market quotes to produce daily indicative analysis reports which will be provided to participants by CME Clearing for the days leading up until the production primary conversion.

Section 2 of this document provides an overview of the F-TIIE curve construction on the primary conversion date of November 22, 2024 and also provides details on F-TIIE curve construction beyond that date. For daily conversions, which are scheduled to occur after November 22, 2024, CME will use the F-TIIE curve based on market quotes as described in Section 3. Section 4 describes the curve used for daily indicative analysis reports through November 21, 2024.

2. **F-TIIE Curve Construction on November 22, 2024**

2.1 Curve Inputs

CME will use the first two CME-listed F-TIIE monthly futures contracts followed by F-TIIE vanilla OIS instruments (based on implying quotes, which is described in Sections 2.2 and 2.3) starting with the 3M tenor.

The input instruments used in curve construction are listed in Tables 2.1.1 – 2.1.3.

MXN F-TIIE	CME FTIIE Futures: contracts corresponding to November 2024 and December 2024 expiry
	OIS : 3M, 6M, 9M, 1Y-5Y, 7Y, 10Y, 15Y, 20Y, 30Y

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Table 2.1.1

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MXN 28D TIIE	Deposits : Mexico Interbank TIIE 28 Day
	IRS : 3M, 6M, 9M, 1Y-5Y, 7Y, 10Y, 15Y, 20Y, 30Y

Table 2.1.2

MXN Discounting	FX Forwards: ON, TN, SP, 1W, 1M, 2M, 3M, 6M, 9M, 1Y
	CCS[1] : 2Y-5Y, 7Y, 10Y, 15Y, 20Y, 30Y
	Dependent Curves : USD SOFR 1D

Table 2.1.3

[1] MXN deliverable cross currency swap (CCS) exchanges SOFR 1D floating rate with MXN TIIE 28D floating rate.

2.2 Curve Quotes

The inclusion of the first two CME listed F-TIIE futures quotes ensures the use of market levels for any forecasted F-TIIE fixings occurring prior to January 1, 2025, since 28D TIIE and F-TIIE rates are not linked by Bank of Mexico's modification formula during this period.

OIS instruments starting with the 3M tenor are used to build the rest of the curve. Due to the lack of liquidity in F-TIIE OIS, CME plans to imply quotes for the OIS instruments to be used in curve construction, using Bank of Mexico's modification formula (without the component A representing the change in target rate for monetary policy purposes):

$$28DTIIE_t = \left[\left(1 + \frac{TF_{t-1}}{360}\right)^{28} - 1\right] * \frac{360}{28} + Adjustment\ Differential \qquad (2.2.1)$$

Where:

TF_{t-1} represents F-TIIE fixing for previous day ($t-1$)

$Adjustment\ Differential$ represents the constant spread adjustment of 24 basis points calculated by the Bank of Mexico

2.3 Methodology

Step 1: Construct the 28D TIIE curve and implied discounting curve using CME's curve methodology, input instruments (Tables 2.1.2 & 2.1.3) and the corresponding market quotes.

Step 2: Construct the F-TIIE curve out to Dec 31, 2024 (forward date) using CME-listed November and December 2024 F-TIIE futures.

Step 3: Imply the 1-day F-TIIE forwards starting from January 1, 2025, through November 22, 2054 using the modification formula described above in Equation 2.2.1.

The formula to calculate TF_{t-1} can be derived by rearranging the modification formula from Equation (2.2.1) as below:

$$TF_{t-1} = \left\{ \left[1 + (28DTIIE_t - 24bps) * \frac{28}{360} \right]^{\frac{1}{28}} - 1 \right\} * 360 \qquad \textbf{(2.3.1)}$$

Where:

$28DTIIE_t$ represents the 28D forward rate corresponding to date t +1 calculated from 28D TIIE curve from Step 1, more specifically using the below formula:

$$28DTIIE_t = \left(\frac{df_{t+1}^*}{df_{t+1+28}^*} - 1 \right) * \frac{360}{28}$$

Where:

df_t^* is the 28D TIIE curve discount factor corresponding to date t

The projected F-TIIE fixing can also be expressed in discount factor form as: $TF_{t-1} = \left(\frac{df_{t-1}}{df_t} - 1 \right) * \frac{360}{k}$ **(2.3.2)**

Where:

k is the number of days between business day t-1 and t

df_t is the F-TIIE curve discount factor corresponding to business date t

Step 4: Use the set of discount factors (curve) from Steps 2 & 3 in combination with the implied discounting curve to calculate fixed rates for each F-TIIE OIS with tenors listed in Table 2.1.1 such that the NPV is zero. These are the breakeven rates. The process of getting the daily discount factors by combining information from Steps 2 & 3 is described below. Note that Step 2 will give the daily discount factors of the front end of the curve (through December 31, 2024):

Substituting Equation (2.3.2) into Equation (2.3.1):

$$\left(\frac{df_{t-1}}{df_t} - 1 \right) * \frac{360}{k} = \left\{ \left[1 + (28DTIIE_t - 24bps) * \frac{28}{360} \right]^{\frac{1}{28}} - 1 \right\} * 360$$

$$\frac{df_{t-1}}{df_t} = 1 + \left\{\left[1 + (28DTIIE_t - 24bps) * \frac{28}{360}\right]^{\frac{1}{28}} - 1\right\} * k$$

$$df_t = \frac{df_{t-1}}{1 + \left\{\left[1 + (28DTIIE_t - 24bps) * \frac{28}{360}\right]^{\frac{1}{28}} - 1\right\} * k}$$

Using the above formula, daily discount factors for each business day will be sequentially derived.

Step 5: Use the futures quotes along with the OIS breakeven rates listed in Table 2.1.1 calculated in Step 4 to build the F-TIIE curve.

Along with a set of daily discount factors that can be used to price positions at end of day, the methodology also produces input quotes that can be used by market participants to independently replicate curve construction and generate the set of discount factors.

Note, this methodology for the creation of the F-TIIE curve will only be used in production on the primary conversion day of November 22, 2024, as a means of providing participants with greater certainty and transparency around the calculation of the cash compensation component in the primary conversion.

3. **F-TIIE Curve Construction after November 22, 2024 (inclusive of daily conversion cycles)**

Beginning on Monday, November 25, 2024 CME will use market quotes sourced from multiple data sources to construct the MXN F-TIIE curve. Table 3.0.1 lists the inputs that will be used.

MXN F-TIIE	CME FTIIE Futures: First Two (2) contracts
	OIS : 3M, 6M, 9M, 1Y-5Y, 7Y, 10Y, 15Y, 20Y, 30Y

Table 3.0.1

The MXN 28D TIIE and MXN Implied Discounting curves will also use market quotes with the input instruments remaining unchanged from Tables 2.1.2 and 2.1.3.

Note that daily conversion cycles taking place from November 25, 2024 forward will rely on independent market quote-based curves.

4. F-TIIE Curve Used in Daily Indicative Analysis Report through November 21, 2024

CME will continue to use market quotes sourced from multiple data sources to construct the MXN F-TIIE, MXN 28D TIIE and MXN Implied Discounting curves based on current production instruments in curve construction. These set of curves will be used for daily mark to market and will be input for production of the daily indicative analysis report published by CME through November 21, 2024.

The final indicative analysis report published on November 22, 2024, will rely on the curve construction outlined in Section 2 and will contain official cash compensation amounts for the production primary conversion.