

# IRS Clearing Operational Workflows

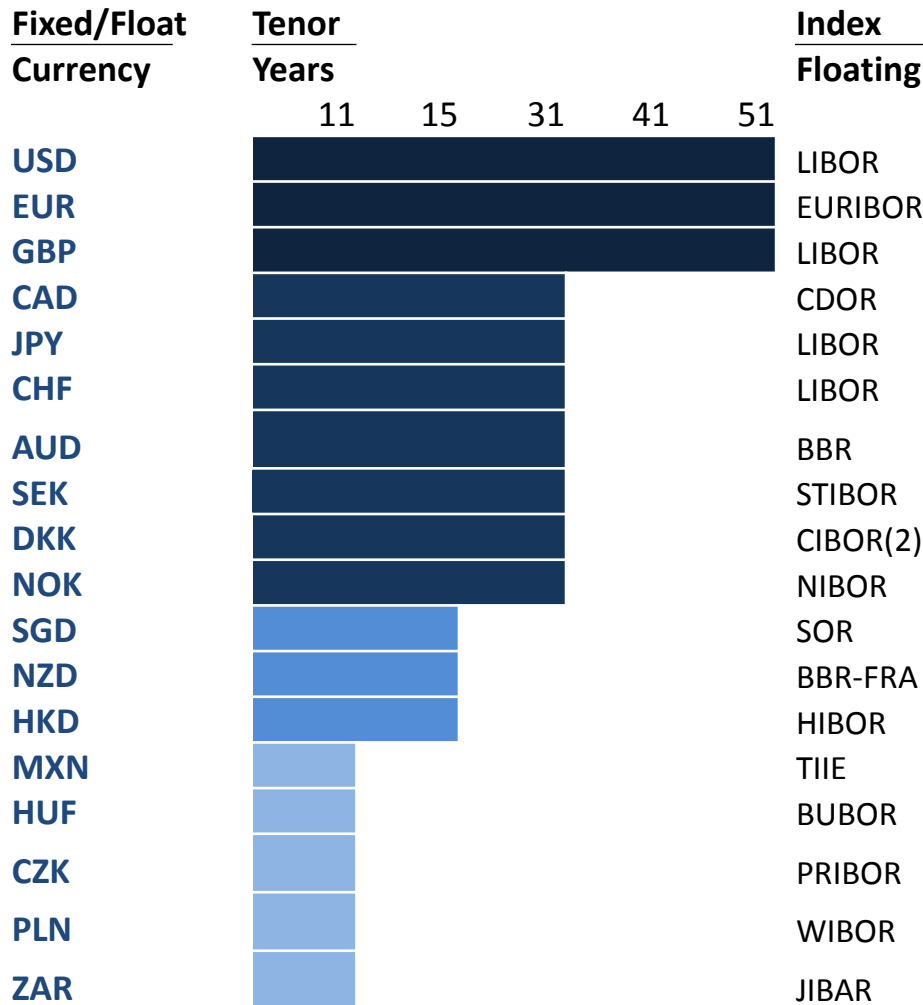
*Product Scope, Clearing Workflows, Valuation & Timing, Cash Flows, Initial Margin, Safeguards*

**March 2014**

# Contents

- **Product Scope**
- **Clearing Workflows**
- **Valuation and Timing**
- **Cash Flows**
- **Initial Margin**
- **Safeguards**
- **MXN TIIE Swap details**

# CME OTC IRS – Product Scope Overview



*\*All fixed/float and basis swaps support variable notionals*

## Future Fixed /Float Products

BRL	█	CDI
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## Zero Coupon Swap

USD | EUR | GBP 50 Years

## Overnight Index Swap

USD | EUR | GBP | JPY 31 Years

## Basis Swap

USD | EUR | GBP 51 Years  
 AUD | JPY 31 Years  
 Fed Funds vs. Libor (USD) 31 Years

## Forward Rate Agreement

USD | EUR | GBP | JPY 3 Years

## Future Expansions

Swaptions

Inflation Swaps

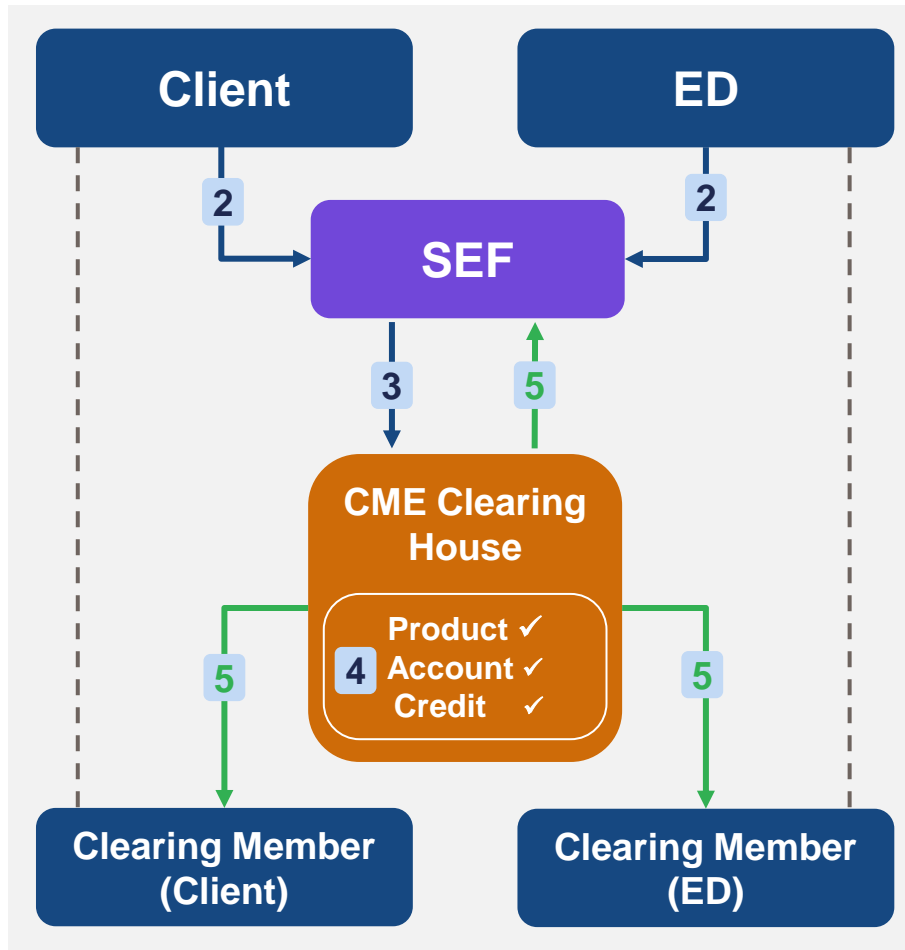
Cross Currency Basis Swaps



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# New Trade: Sunny Day Scenario – SEF Workflow



1 – Trade receives credit pre-approval from FCM (precedes this workflow)

2 – Client executes trade with Executing Dealer (ED) on SEF

3 – SEF sends trade to CME for Clearing

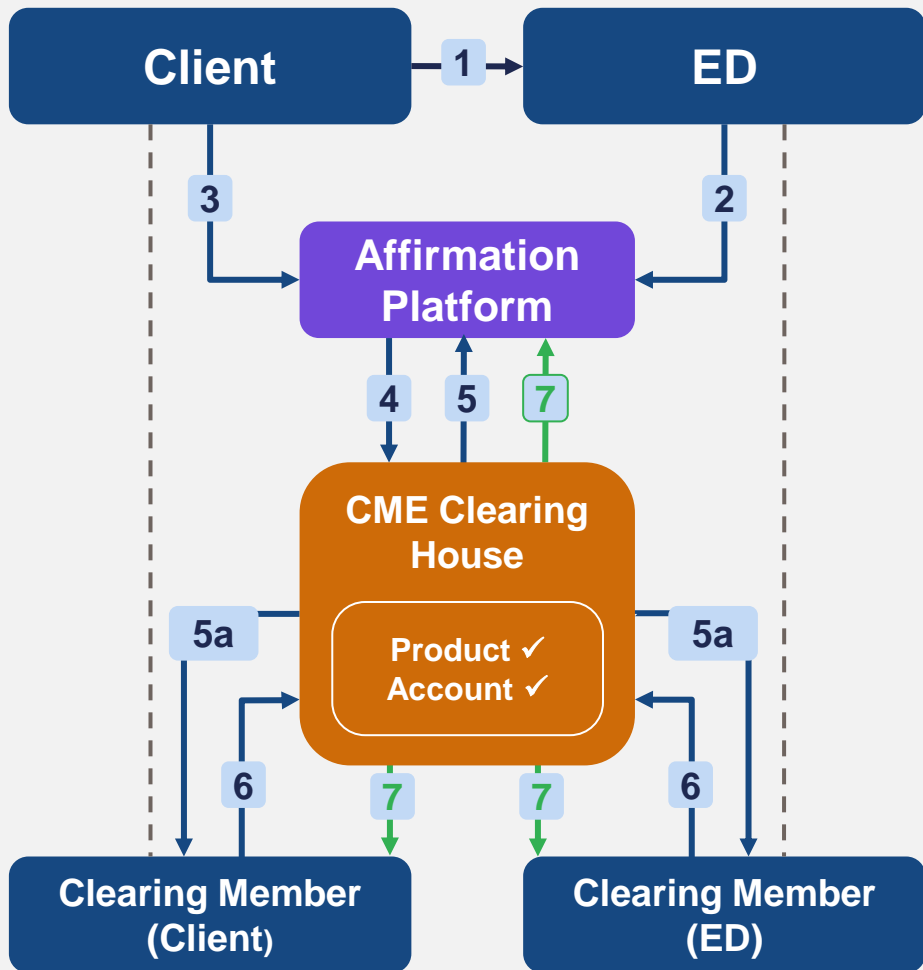
4 – After validating product, account and applying credit limits set by CME, CME accepts swap for clearing

5 – CME sends "Cleared" notification to SEF which displays trade status to principals

5 – CME sends a Clearing Confirmation to FCMs

\*Please note a pre-approved trade does not go through request consent workflow

# New Trade: Sunny Day Scenario – Platform Workflow



- Validations, notifications and confirmations are real time and allow Straight Through Processing

1 – Client executes swap with Executing Dealer (ED)

2 – ED alleges swap to Client

3 – Client selects Clearing Member and affirms swap

4 – Affirmation Platform sends matched trade to CME for Clearing

5 – CME sends “Pending DCM Approval” notification to Affirmation Platform

5a – “Clearing Consent” notifications sent to Clearing Member (Client) and Clearing Member (ED).

6 – Clearing Member of both parties accept the swap

7 – CME sends a Clearing Confirmation to Clearing Member(s)

7 – CME sends “Cleared” notification to Affirmation Platform which displays trade status to principals

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# Valuation Curves

Product	Forecasting	Discounting
<b>AUD-BBR-BBSW</b>	BBRBBSW3M	AONIA
<b>CAD-BA-CDOR</b>	BACDOR3M	CORRA
<b>CHF-BBA-LIBOR</b>	CHFLIBOR6M	CHFLIBOR6M
<b>CZK PRIBOR</b>	PRIBOR6M	PRIBOR6M
<b>DKK CIBOR(2)</b>	CIBOR6M	CIBOR6M
<b>EURIBOR</b>	EURIBOR3M	EONIA
<b>FED FUNDS</b>	FEDFUNDS	FEDFUNDS
<b>GBP OIS</b>	SONIA	SONIA
<b>GBP-LIBOR</b>	GBPLIBOR6M	SONIA
<b>HKD-HIBOR</b>	HIBOR3M	HIBOR3M
<b>HUF BUBOR</b>	BUBOR6M	BUBOR6M
<b>JPY OIS</b>	TONAR	TONAR
<b>JPY-BBA-LIBOR</b>	JPYLIBOR3M	TONAR
<b>MXN TIIE</b>	TIIE 28D	MXN/USD Basis
<b>NOK NIBOR</b>	NIBOR6M	NIBOR6M
<b>NZD BBR</b>	BKBM3M	BKBM3M
<b>PLN WIBOR</b>	WIBOR6M	WIBOR6M
<b>SEK STIBOR</b>	STIBOR3M	STIBOR3M
<b>SGD-SOR</b>	SOR6M	SOR6M
<b>USD LIBOR</b>	LIBOR3M	Fed Funds
<b>USD OIS</b>	OIS	Fed Funds
<b>ZAR JIBAR</b>	JIBAR3M	JIBAR3M



# Curve Snap Timings

End of Day Valuation Inputs	
Currency	Time (Local)
AUD	4:30 PM Sydney
CAD	3:00 PM New York
CHF	4:00 PM London
CZK	4:00 PM Central European
DKK	4:00 PM Central European
EUR	4:00 PM London
GBP	4:00 PM London
HKD	4:30 PM Hong Kong
HUF	4:00 PM Central European
JPY	3:00 PM Tokyo
MXN	2:00 PM Mexico City
NOK	4:00 PM Central European
NZD	4:30 PM Wellington
PLN	4:00 PM Central European
SEK	4:00 PM Central European
SGD	4:30 PM Singapore
USD	3:00 PM New York
ZAR	4:00 PM SAST

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# Cash Flows

## Currency Settlement Convention

CME settles the following currencies on a T+1 (next business day) basis:

- USD, EUR, GBP, CAD

All other currencies are settled on a T+2 basis:

- MXN, CHF, AUD, JPY, NOK, SEK, SGD, NZD, DKK, HKD, PLN, CZK, HUF, ZAR

## Upfront Amount

### Upfront Amounts are typically associated with off-par swaps

- CME accepts flexible dates for Upfront Amounts – T+1 (or T+2) through maturity date
- Money movement nets with the VM
- Trade Register will show the Upfront Amount

# Cash Flows – Continued

## Price Alignment Interest (PAI)

- Cash variation margin settlement creates a basis between cleared and non-cleared swaps
- Price Alignment Interest *removes the basis risk*
- On holidays, which are **not** clearing holidays, the PAI amount will be '0'

### Calculation

$$PAI = -Adjusted\ NPV_{(prev\ bus.\ day)} \times Latest\ Overnight\ Funding\ Rate \times (Days / 360\ or\ 365)$$

*Days = number of days from current day to next business day (in calendar of currency)*

- PAI rates are documented on end of day reports

**Note:** *PAI is a negative number to account for the fact that the party with positive Adjusted NPV Pays the PAI Amount to the party with negative Adjusted NPV*

## Variation Margin

### Calculation

$$Variation\ Margin = Adjusted\ NPV\ (Close) - Adjusted\ NPV\ (Previous\ close)$$

# Cash Flows – Continued

## Coupon Payment

- Objective: Net Coupon and VM flows to avoid cash flow reversals
- Coupon reflected on trade register one clearing business day (or T-2 for T+2 settled currencies) before coupon settlement date
  - Cash flows in trade register are settled on T+1 (or T+2) at 8:30 a.m. EST
  - Affects NPV + VM OR Net Banked Cash to accommodate netting of cash flows

## Net Cash Flow

### *Calculation*

***Net Banked Cash Flow = VM + Coupon + PAI + Upfront fees***

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# Current IRS Margin Model

## Margin Model Goals

Scalable to other currencies and asset classes



Coverage meets target levels: 5-day losses during 99% of days



Quickly reacts to changes in rate and volatility regimes



Stable during periods of low and moderate volatility



Ease of implementation



Transparency for market participants



# Current IRS Margin Model

## *Historical VaR*

### The Margin Methodology leverages a Historical VaR Model

- Volatility rescaling to determine margins for a given IRS portfolio
- Historical shocks are scaled to simulate potential volatility environments prior to generating a P/L distribution for VaR calculations
- Model incorporates 1,260 days (5 years) of 5-day log returns and uses a 99.7% confidence level
- Model achieves 99% coverage
- This model provides:
  - Desired portfolio coverage
  - Scalability (multiple currencies, asset classes)
  - Simplicity and transparency
- EWMA Historical VaR model adjusts historical shocks (returns) to account for an estimate of volatility over the future 5-day horizon; typically, margins are higher than plain (“un-scaled”) Historical VaR as volatility is forecasted to ramp up and vice-versa

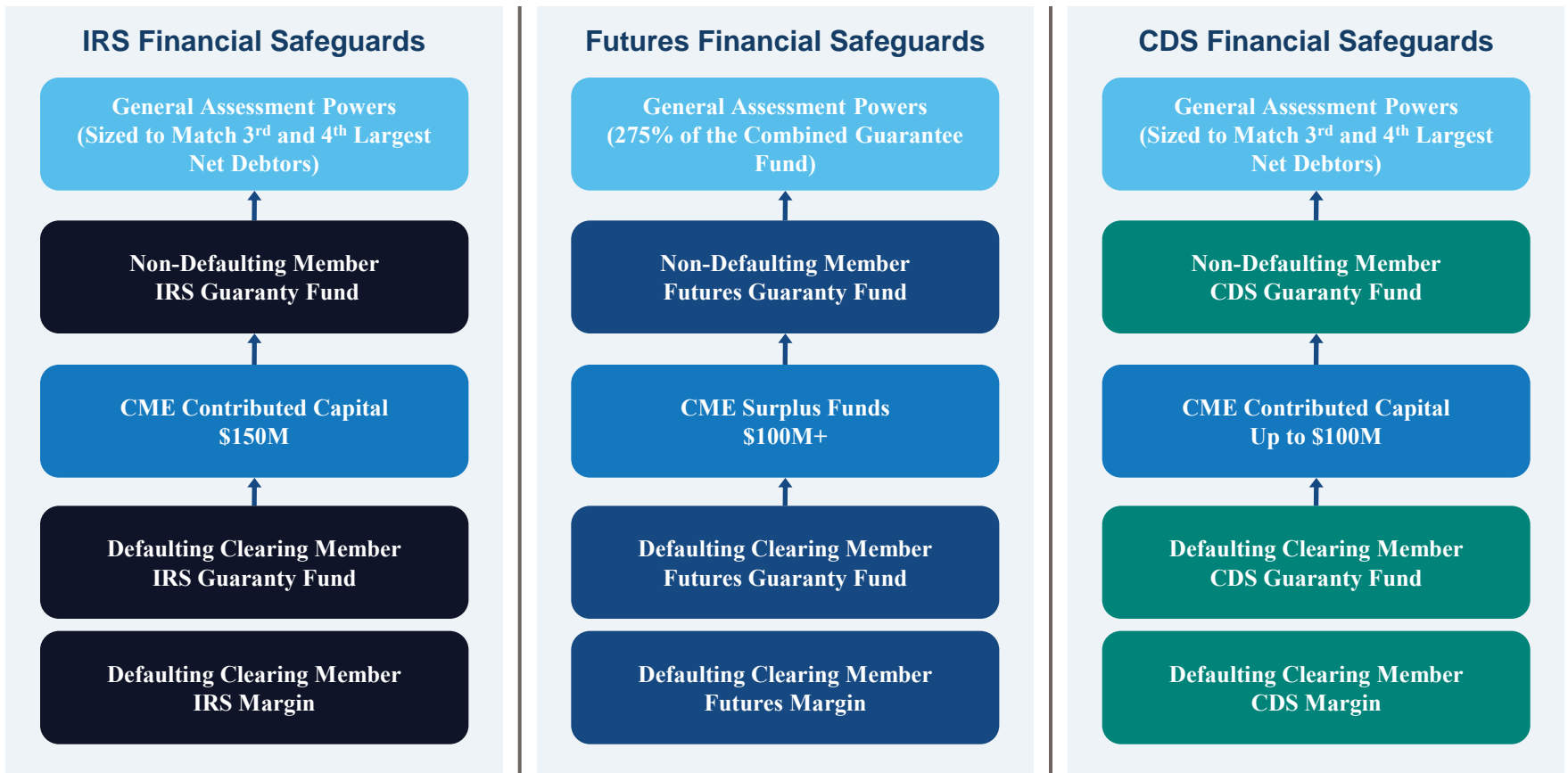


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# Financial Safeguards Structures

## Clearinghouse Overview



# IRS Financial Safeguards Structures

## Financial Safeguards Sizing

### Step 1: Calculate Net Debtor Profiles

Stress Test – Margin = Net Debtor Shortfall

### Step 2: Identify 4 Largest Net Debtors To Size Financial Safeguards

1<sup>st</sup> and 2<sup>nd</sup> Largest Net Debtors = Guaranty Fund (Funded)

3<sup>rd</sup> and 4<sup>th</sup> Largest Net Debtors = Assessments (Unfunded)

### Step 3: Calculate Each IRS Clearing Member Guaranty Fund Contribution

Pro-Rata Share of IRS Guaranty Fund

### Step 4: Calculate Each IRS Clearing Member Potential Assessments

Account for impact of losing four largest assessment powers

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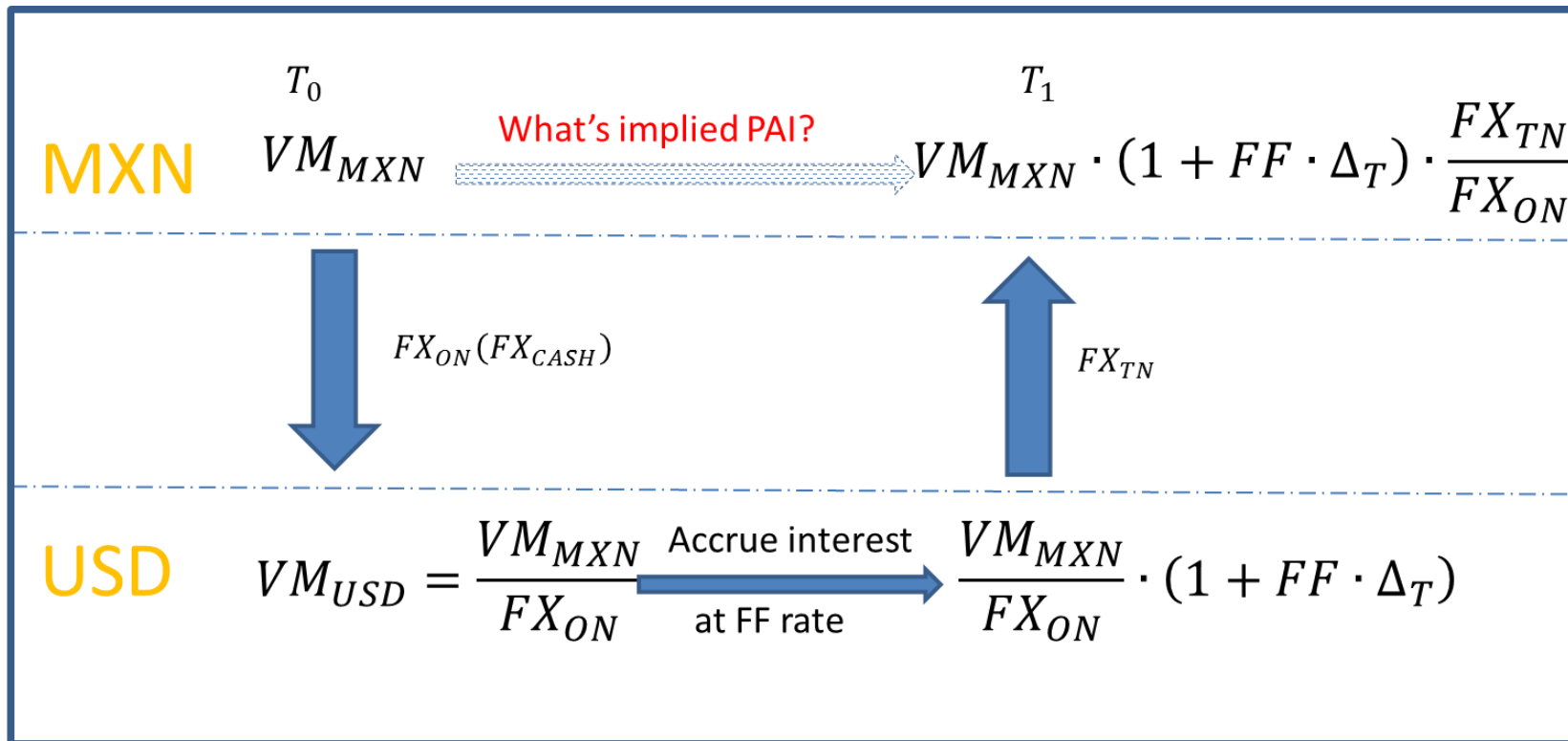
# Product Scope

- **Index: MXN-TIIE-Banxico**
- **Payment Frequency: 28D**
- **Maturity: Up to 11Y**
- **Customization:**
  - Stubs,
  - Effective Date
  - Maturity Date
  - Business Day conventions
  - Calendars
  - Day Count Fraction

# Key Product Consideration

- MXN Swaps are priced using a USD funding.
  - The future coupon payment forecasts will take into account the MXN TIIE curve only.
  - For Discounting a MXN discount curve will be constructed taking into account USD OIS and USD MXN basis. We will end up with a MXN NPV
- Since moving Coupons in MXN Peso are contractual obligations for this currency, all cash flows VM, Coupon, PAI, Upfront will all move in MXN Pesos
- We are using USD funding for pricing, so we will use a “fed fund” rate to compute the equivalent PAI amount – Here is the high level process
  - Cumulative VM is in Pesos
  - Convert it using the relevant FX rate (FX0) to cumulative VM in USD
  - Using the USD VM number and Fed Funds rate compute the PAI amount in USD
  - Convert the USD VM and PAI amount back to Pesos using the relevant FX rate (FX1)

# Representation of USD Funding



$$VM_{MXN} \cdot (1 + PAI \cdot \Delta_T) = VM_{MXN} \cdot (1 + FF \cdot \Delta_T) \cdot \frac{FX_{TN}}{FX_{ON}}$$

→

$$PAI = FF \cdot \frac{FX_{TN}}{FX_{ON}} + \frac{\frac{FX_{TN}}{FX_{ON}} - 1}{\Delta_T}$$