

# 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 TIE Swap details**

# CME OTC IRS – Product Scope Overview

Fixed/Float Currency	Tenor Years	Index Floating
	11 15 31 41 51	
USD		LIBOR
EUR		EURIBOR
GBP		LIBOR
CAD		CDOR
JPY		LIBOR
CHF		LIBOR
AUD		BBR
SEK		STIBOR
DKK		CIBOR(2)
NOK		NIBOR
SGD		SOR
NZD		BBR-FRA
HKD		HIBOR
MXN		TIIE
HUF		BUBOR
CZK		PRIBOR
PLN		WIBOR
ZAR		JIBAR

*\*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

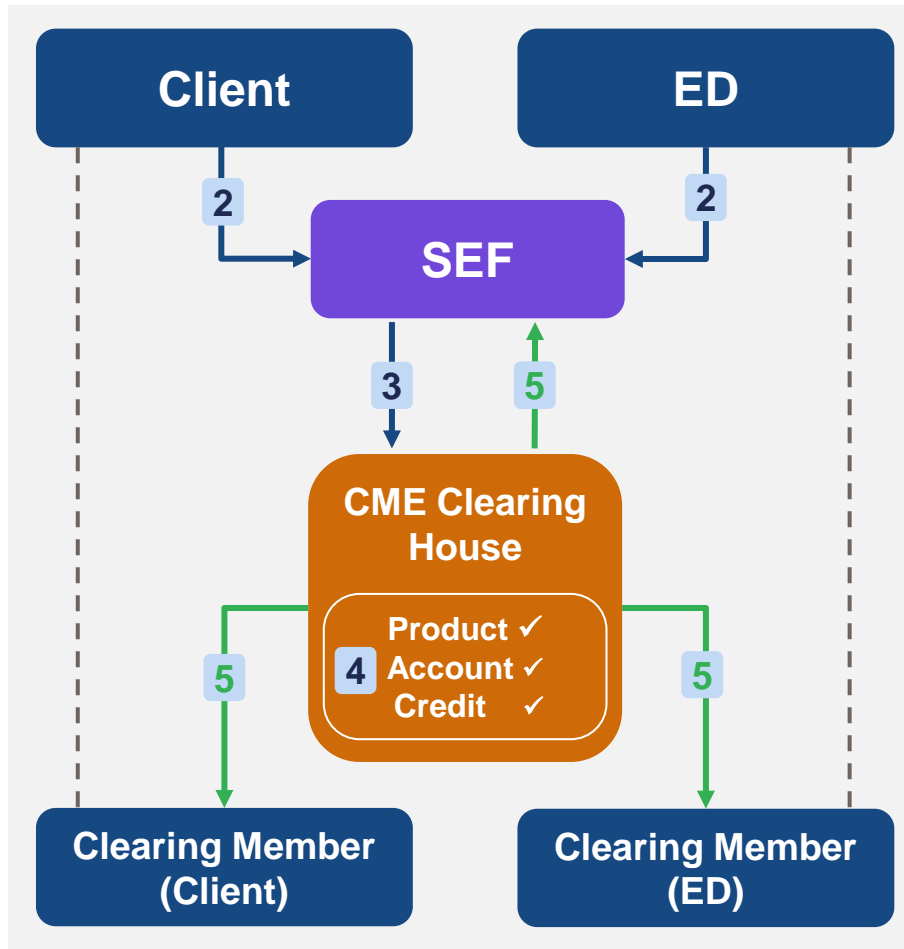
Cross Currency Basis Swaps



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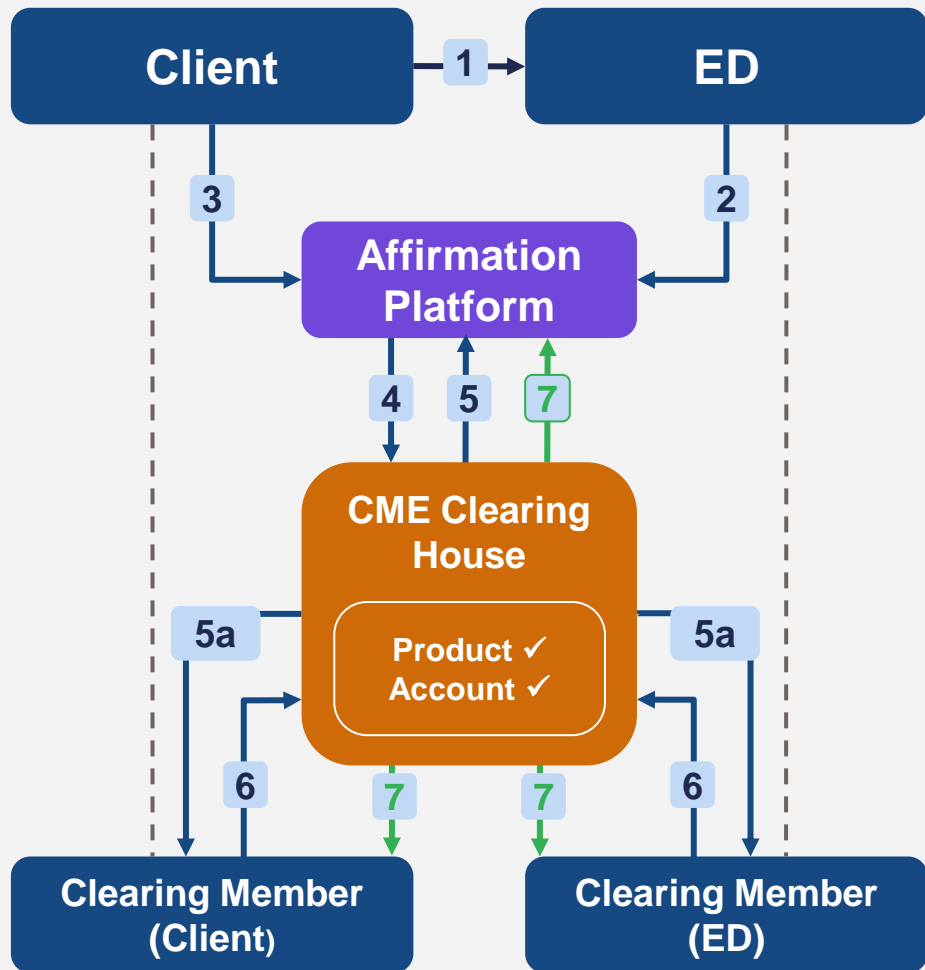
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# New Trade: Sunny Day Scenario – SEF Workflow



\*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*

$$\text{Net Banked Cash Flow} = \text{VM} + \text{Coupon} + \text{PAI} + \text{Upfront fees}$$

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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

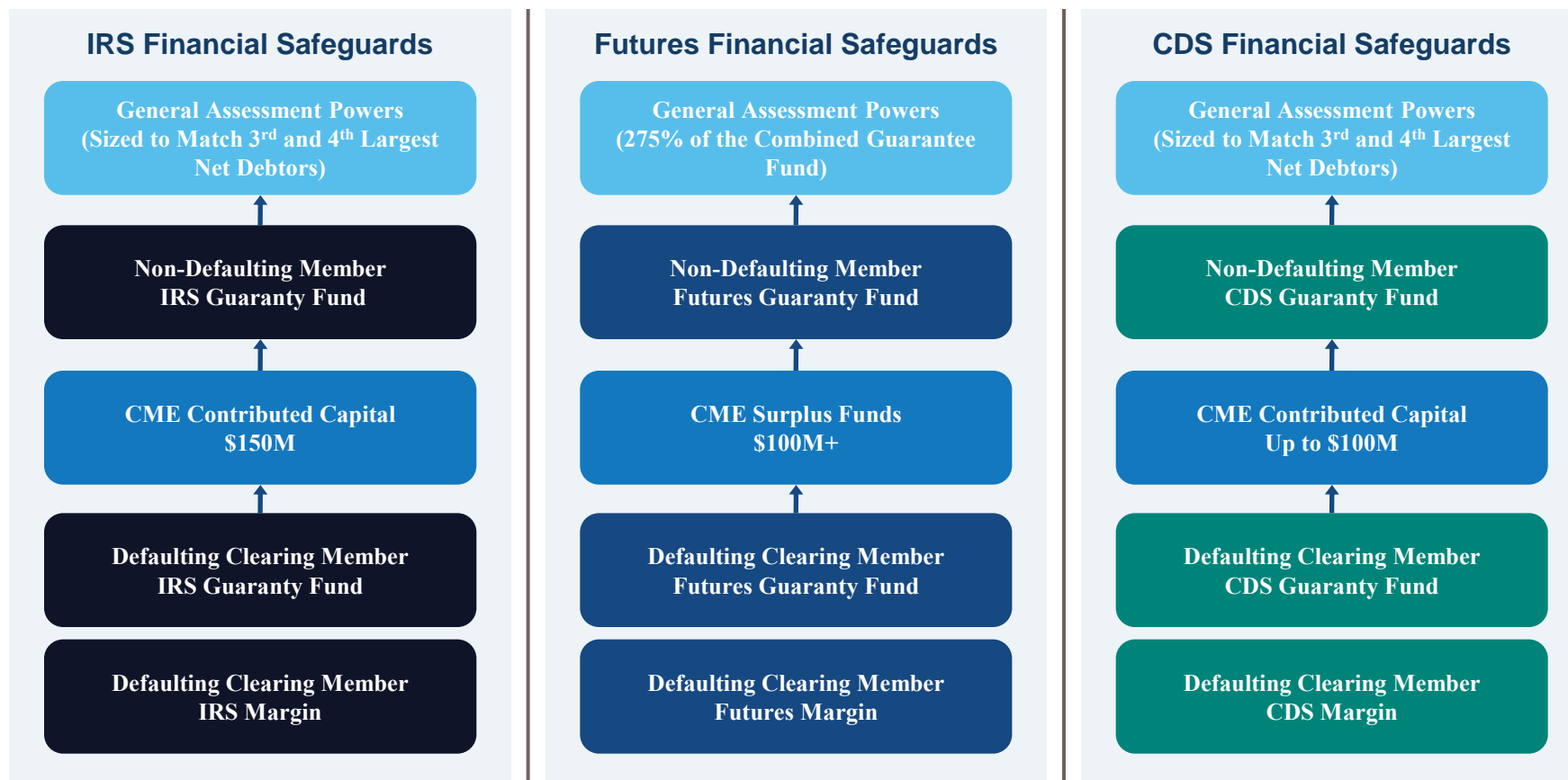


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# Financial Safeguards Structures

## 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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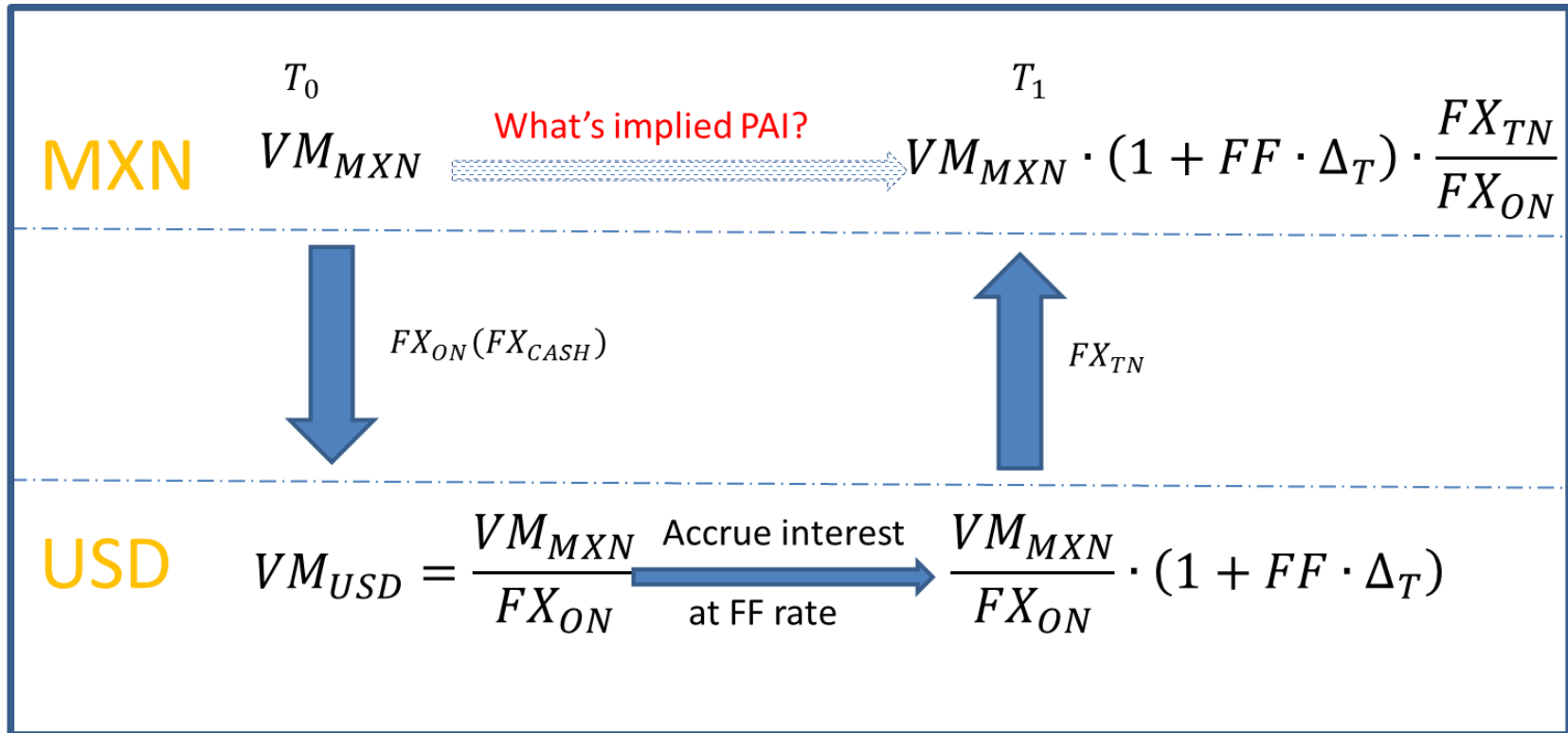
# Product Scope

- **Index: MXN-TIIE-Banxico**
- **Payment Frequency: 28D**
- **Maturity: Up to 11Y**
- **Custumization:**
  - 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



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

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